DRAFT
Initial Study/Mitigated Negative Declaration

Bowerman Power Renewable Natural Gas Plant Project

October 2024

Prepared for:

COUNTY OF ORANGE
OC Waste&Recycling
Our Community. Our Commitment.

601 N. Ross Street, 5th Floor
Santa Ana, CA 92701

Prepared by:

17885 Von Karman Avenue,
Suite 500
Irvine, CA 92614

BOWERMAN POWER RENEWABLE NATURAL GAS PLANT PROJECT

PROPOSED MITIGATED NEGATIVE DECLARATION AND NOTICE OF INTENT TO ADOPT THE PROPOSED MITIGATED NEGATIVE DECLARATION

This serves as the Notice of Intent by O C Waste & Recycling (OCWR) to adopt a Mitigated Negative Declaration for the Bowerman Power Renewable Natural Gas Plant Project, prepared in accordance with the California Environmental Quality Act (CEQA) and its guidelines.

Name of Project: Bowerman Power Renewable Natural Gas Plant Project ("Project").

Project Location: The proposed renewable natural gas plant is located at the Frank R. Bowerman (FRB) Landfill at 11006 Bee Canyon Access Road in unincorporated Orange County, California, north and within the sphere of influence of the City of Irvine. The Project involves constructing a renewable natural gas processing plant and a new SoCalGas pipeline connecting the processing plant to an existing SoCalGas pipeline at the corner of Portola Parkway and Jeffrey Road. FRB Landfill is located within Township 5 South, Range 8 West, and parts of Sections 143, 144, 145, and 118 of the El Toro, California, U.S. Geological Survey (USGS) 7.5-minute Quadrangle Map (1997).

Lead Agency: OCWR
601 N. Ross Street, 5th Floor
Santa Ana, CA 92701

Lead Proponent: Bowerman Power LFG, LLC (Bowerman Power)
5313 Campbells Run Road
Suite 200
Pittsburgh, PA 15205

Project Description: A renewable natural gas (RNG) plant will be designed to produce RNG from landfill gas (LFG) that is produced by the FRB Landfill and deliver it to SoCalGas.

The Project site is not designated a hazardous waste property, nor is it a hazardous waste disposal site as defined under Section 65962.5 of the California Government Code.

- **NOTICE IS HEREBY GIVEN THAT** the OCWR proposes to adopt a Mitigated Negative Declaration for the above-cited Project. This Mitigated Negative Declaration is based on the finding that, by implementing the identified mitigation measures, the Project's potential impacts will be maintained at a less than significant level. The reasons to support such a finding are

documented by the Initial Study prepared by Tetra Tech, Inc. Copies of the Initial Study, the proposed Mitigated Negative Declaration, and supporting materials are available for review at: https://oclandfills.com/page/bowerman-power-rng-ceqa

- OCWR located at 601 N. Ross Street, 5th Floor, Santa Ana, California, 92701; and
- Irvine Heritage Park Library, 14261 Yale Avenue, Irvine, CA 92604.

For questions regarding the Mitigated Negative Declaration, please contact:

NAME: Francine Bangert **PHONE**: 714.834.4059

TITLE: Public Information Officer **EMAIL:** ocwr-ceqareview@ocwr.ocgov.com

ADDRESS: OCWR
601 N. Ross Street, 5th Floor
Santa Ana, CA 92701

Public Review Period: **30 days** **Begins:** 10/17/2024 **Ends:** 11/15/2024

Public Meeting: A Virtual Public Information Meeting will be conducted on October 22, 2024, at 6:00 p.m. Visit https://oclandfills.com/events for virtual meeting details.

Public Hearing: Adoption of the Mitigated Negative Declaration will be considered at a public hearing by the County of Orange Board of Supervisors which is proposed for January 28, 2025, at 9:30 a.m. at the County of Orange Hall of Administration Board of Supervisors - Board Hearing Room, First Floor, 400 W. Civic Center Drive, Santa Ana, California

In accordance with CEQA Guidelines, any comments concerning the findings of the proposed Initial Study/Mitigated Negative Declaration must be submitted in writing and **received by the OCWR no later than 5:00 p.m. on November 15, 2024**, in order to be considered prior to the final determination on the Project by OCWR. Please submit your written comments to Francine Bangert, Public Information Officer, OCWR, 601 N. Ross Street, 5th Floor, Santa Ana, CA 92701 or via email to ocwr-ceqareview@ocwr.ocgov.com.

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Acronyms and Abbreviations

3D	three dimensional
§	Section
ADT	average daily trip
AQIA	Air Quality Impact Assessment
AQMP	Air Quality Management Plan
BACT	Best Available Control Technology
BMP	best management practice
Bowerman Power	Bowerman Power LFG, LLC
BP	Before Present
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CBC	California Building Code
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CWA	Clean Water Act
dBA	A-weighted decibel
DOT FHWA	U.S. Department of Transportation Federal Highway Administration
FRB	Frank R. Bowerman
FTA	Federal Transit Administration
GHG	Greenhouse Gas
GIS	geographic information system
GPS	global positioning system
HCP	Habitat Conservation Plan
HDD	Horizontal Directional Drilling
HRA	Health Risk Assessment
Hz	Hertz
IS Initial Study	

ISO	International Organization for Standardization
IUSD	Irvine Unified School District
IRWD	Irvine Ranch Water District
JOST	Jeffery Open Space Trail
KOP	key observation point
L_{eq}	equivalent noise level
LFG	landfill gas
LST	Localized Significance Threshold
MLD	Most Likely Descendent
MND	Mitigated Negative Declaration
MT	Metric Ton
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Planning
NPDES	National Pollutant Discharge Elimination System
OC Parks	Orange County Parks
OCFA	Orange County Fire Authority
OCFCD	Orange County Flood Control District
OCSD	Orange County Sheriff's Department
OCWR	OC Waste & Recycling
OSR	Open Space Reserve
Plant	renewable natural gas production plant
POR	Point of Receipt
PPV	peak particle velocity
PRC	Public Resources Code
Project	Bowerman Power Renewable Natural Gas Plant Project
RELOOC	Regional Landfill Options for Orange County
RNG	renewable natural gas
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCAG	Southern California Association of Governments

SCAQMD	South Coast Air Quality Management District
SCCIC	South-Central Coastal Information Center
SCE	Southern California Edison
scfm	standard cubic feet per minute
SCS	Sustainable Communities Strategy
SRA	State Responsibility Area
SSC	Species of Special Concern
SWPPP	Stormwater Pollution Prevention Plan
Tetra Tech	Tetra Tech, Inc.
TOU	Time of Use
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
UWMP	Urban Water Management Plan
WQMP	Water Quality Monitoring Plan

1.0 INTRODUCTION

Bowerman Power LFG, LLC (Bowerman Power) is working with OC Waste & Recycling (OCWR) to develop a renewable natural gas (RNG) production plant (Plant) on land at the Frank R. Bowerman (FRB) Landfill leased to Bowerman Power by OCWR, to be known as the Bowerman Power Renewable Natural Gas Plant Project (Project). The RNG Plant will be designed to produce RNG from landfill gas (LFG) that is produced by the FRB Landfill and deliver it to SoCalGas.

Following an initial review of the proposed Project, OCWR has determined that it is subject to the guidelines and regulations of the California Environmental Quality Act (CEQA). This Initial Study (IS) addresses the environmental effects of the Project, as proposed.

1.1 Statutory Authority and Requirements

This Mitigated Negative Declaration (MND) has been prepared for review and approval by OCWR with technical assistance from Tetra Tech, Inc. (Tetra Tech) to evaluate if implementation of the proposed Project would have a significant effect on the environment. Pursuant to Section 15070 of the *Guidelines for Implementation of the California Environmental Quality Act* (14 California Code of Regulations Sections (§§) 15070-15075), a public agency shall prepare or have prepared a proposed negative declaration or mitigated negative declaration for a project subject to CEQA when:

> *(a) The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or*
>
> *(b) The initial study identifies potentially significant effects, but:*
>
> > *(1) Revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and*
> >
> > *(2) There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment.*

1.2 Required Content

CEQA Guidelines Section 15071 indicate that a Negative Declaration circulated for public review shall include:

> *(a) A brief description of the project, including a commonly used name for the project, if any;*
>
> *(b) The location of the project, preferably shown on a map, and the name of the project proponent;*
>
> *(c) A proposed finding that the project will not have a significant effect on the environment;*
>
> *(d) An attached copy of the Initial Study documenting reasons to support the finding; and*
>
> *(e) Mitigation measures, if any, included in the project to avoid potentially significant effects.*

2.0 PROJECT INFORMATION

Project title:	Bowerman Power Renewable Natural Gas Plant Project
Lead agency name and address:	**OC Waste & Recycling** 601 N. Ross Street, 5th Floor Santa Ana, CA 92701
Contact person and phone number:	**Francine Bangert, Public Information Officer** 714.834.4059
Project location:	The proposed renewable natural gas (RNG) plant is located at the Frank R. Bowerman (FBR) Landfill at 11006 Bee Canyon Access Road in unincorporated Orange County, California, north and within the sphere of influence of the City of Irvine. The Project involves constructing an RNG processing plant and a new SoCalGas pipeline connecting the processing plant to an existing SoCalGas pipeline at the corner of Portola Parkway and Jeffrey Road; see Figure 2-1, Project Vicinity, and Figure 2-2, Project Location, for additional details.
Project sponsor's name and address:	**Bowerman Power LFG, LLC (Bowerman Power)** 5313 Campbells Run Road Suite 200 Pittsburgh, PA 15205
Contact person and phone number:	**Sharon Frank, Vice President Environmental Health and Safety** 412.327.2360
General Plan Designation:	4LS (Public Facilities Landfill Site)
Zoning Designation:	A1 General Agriculture
Surrounding land uses:	The surrounding land uses consist of Open Space Reserve. State Routes 241 and 133 are located to the west, approximately 0.5 and 0.6 miles, respectively. Interstate 5 is located approximately 3.8 miles to the west, and Interstate 405 is located approximately 5.4 miles to the southwest.

2.1 Environmental Setting

The Project will be located at the FRB Landfill in unincorporated Orange County within the sphere of influence of the City of Irvine, except for the new SoCalGas pipeline, which will be located within the City of Irvine.

2.1.1 Regional

Orange County is located along the Pacific Ocean between Los Angeles County to the north and northwest, San Bernardino County to the northeast, Riverside County to the east, and San Diego County to the southeast, covering 798 square miles (County of Orange 2012). The FRB Landfill is in one of the unincorporated areas of Orange County. The unincorporated territory, consisting of approximately 321 square miles, is geographically diverse with unincorporated areas spread throughout Orange County.

The City of Irvine is situated in central Orange County and covers approximately 66 square miles of land (City of Irvine 2022; see Figure 2-1, Project Vicinity). The City boundaries stretch from State Route 73 in the southwest to the foothills of the Santa Ana Mountains in the northeast. The FRB Landfill is situated in these foothills northeast of the City.

Physiographically, the FRB Landfill is located in the Peninsular Ranges Geomorphic Province, which is characterized by a series of mountain ranges that are sub-parallel to the coast from Los Angeles to San Diego (CGS 2002). The Santa Ana Mountains are located in the northern end of the province, and the Project site is located on the southwestern flank of the Santa Ana Mountains, in the foothills that transition to an alluvial plain which encompasses most of the City of Irvine. The FRB Landfill is located within the Bee Canyon topographic feature providing space to accommodate a large volume of municipal solid waste. Bee Canyon is within the larger San Diego Creek watershed, which drains across the alluvial plain and into Newport Back Bay, and from there connects to the Pacific Ocean.

The FRB Landfill is surrounded by an area designated by the Orange County General Plan as Open Space Reserve (OSR) and is part of the Orange County Central and Coastal Subregion Natural Communities Conservation Plan/Habitat Conservation Plan Reserve.

2.1.2 Project Site

The Project site is situated near the northeastern edge of the City of Irvine (see Figure 2-2, Project Location) and within the FRB Landfill boundaries, except for the western end of the new SoCalGas pipeline connecting to the existing SoCalGas pipeline. The Project will consist of three “localities” where disturbances will occur: the new Project RNG Plant, the new SoCalGas pipeline, and the existing soil stockpile area (see Figure 2-3, Project RNG Plant Site and FRB Landfill Soil Stockpile Area Locations and Figure 2-4, Proposed SoCalGas Pipeline Route).

The RNG Plant site involves 3.52 acres of part of the undeveloped land leased to Bowerman Power by OCWR (see Figure 2-3). This land is adjacent to the existing Bowerman Power 19.6-megawatt landfill gas to energy facility (Bowerman Power Plant) and the FRB Landfill flare station. Approximately 70,000 cubic yards of fill material will be extracted from an existing soil stockpile area (see Figure 2-3) within

the FRB Landfill boundaries and will be used to provide fill materials for the RNG Plant pad including a point of receipt (POR) facility to be developed and operated by SoCalGas.

The new SoCalGas pipeline will run from the POR within the RNG Plant boundary, down Bee Canyon Access Road to the existing SoCalGas pipeline on the corner of Portola Parkway and Jeffery Road. The new SoCalGas pipeline will be approximately 2.0 miles in length along Bee Canyon Access Road and approximately 0.4 mile in length along Portola Parkway, for a total of 2.4 miles.

2.2 Project Description

2.2.1. Background

The FRB Landfill is a state-of-the-art, Class III, municipal solid waste facility, owned by the County of Orange and operated and maintained by OCWR. FRB Landfill opened in 1990 and spans approximately 725 acres of hillside with 534 acres allocated for waste disposal. It is permitted for 11,500 tons per day maximum with an 8,500 tons per day annual average. The FRB Landfill is currently receiving approximately 8,000 tons of refuse per day. The FRB Landfill has enough projected capacity to serve residents and businesses until approximately 2053. The current permitted capacity is 266 million cubic yards, of which approximately 105.7 million cubic yards have been placed as of June 2022.

The Regional Landfill Options for Orange County (RELOOC) defines the permitted vertical and horizontal expansions for the Master Development Plan of the FRB Landfill (P&D Consultants 2006). The permitted vertical and horizontal expansions are implemented in phases to provide for sufficient landfill operation areas and not disturb all parts of the landfill at once. The Master Development Plan includes three Phase VIII subareas (VIII-A, B, and C). The FRB Master Development Plan also includes several on-site stockpile locations for soil excavated as part of landfill phase development and operations. All soil stockpiles are within the landfill property. The soil is used for daily and intermediate cover, road construction and other related uses. Excavations are currently underway for the development of Phase VIII-A1. Soils excavated from the development of Phase VIII-A1 are stockpiled in the soil stockpile area (see Figure 2-3).

The LFG currently created by the landfill is managed via a gas collection and control system that includes vertical and horizontal gas extraction wells, a collection pipe system, and a flare station complex comprising six flares. The Bowerman Power Plant, an existing 19.6-megawatt landfill gas to energy facility, was opened in 2016 and is an award-winning, public-private partnership producing enough electricity for the City of Anaheim to power 26,000 homes. Bowerman Power currently owns and operates the Bowerman Power Plant. It is located adjacent to the flare station and processes approximately 8,350 standard cubic feet per minute (scfm) of raw LFG. The LFG not processed by the Bowerman Power Plant is incinerated at the flare station.

2.2.1 General Description

Bowerman Power, as the Project Proponent, is proposing to develop an RNG Plant at the FRB Landfill on land at the FRB Landfill leased to Bowerman Power by OCWR. As described above, the LFG not processed by the Bowerman Power Plant is incinerated at the flare station. The RNG Plant will be designed to process the excess LFG that would otherwise require incineration at the existing adjacent

flare station, and then deliver the processed RNG to SoCalGas, as detailed in Table 2-1, and shown in Figure 2-5, RNG Process Design Flow. The RNG Plant layout (see Figure 2-6, Project Site Plan) will comprise two areas: the process equipment area (see Figure 2-7, RNG Process Equipment Area Layout) and the control and electrical buildings (see Figure 2-8, RNG Control / Electrical Buildings Layout).

The RNG Plant will be designed to process a maximum of 6,000 scfm of raw LFG at the inlet. The process will remove nitrogen, oxygen, carbon dioxide, sulfur hydroxide, volatile organic chemicals, hydrogen sulfide, as well as other minor impurities to meet the gas specifications of SoCalGas.

Table 2-1. Project RNG Plant Components

Component	Data
RNG Plant Owner	Bowerman Power
Project Name	Bowerman Power Renewable Natural Gas Plant
Project Site Location	Frank R. Bowerman Landfill 11006 Bee Canyon Access Road Irvine, CA 92602
Landowner	County of Orange
Project Type/Size	LFG to RNG conversion plant (Bowerman Power Plant) Maximum capacity of 6,000 scfm
Source Fuel	Landfill gas; 46-53% methane (dry basis)
Equipment Location	Primarily outdoor equipment with some enclosures (required for noise abatement or environmental control). Electrical and control equipment to be enclosed.

As noted previously, excavation is currently underway for the development of FRB Landfill Phase VIII-A1. The soils removed during the excavation are stockpiled within the FRB Landfill boundaries (see soil stockpile area on Figure 2-3). The RNG Plant pad is expected to require approximately 70,000 cubic yards of fill material. This fill material will be extracted from within the soil stockpile area and trucked to the RNG Plant site for development of the RNG Plant pad.

SoCalGas will develop a POR facility which will receive RNG from the plant, odorize, compress, and insert the RNG into its pipeline. A 250-gallon odorant tank will be installed in the POR facility. SoCalGas will construct a new 12-inch-diameter pipeline to convey the RNG from the POR (see Figure 2-9) on the Project site to the existing SoCalGas pipeline at the corner of Portola Parkway and Jeffrey Road (see Figures 2-4.1 through 2-4.12).

The new RNG Plant will process excess LFG and deliver the resulting RNG to the SoCalGas pipeline. This effort will promote the beneficial reuse of existing and future LFG collected by FRB Landfill, support long-term sustainability goals in the region, and help reduce Orange County's reliance on fossil fuels. Additionally, the Project will contribute to California Public Utility Commission's Renewable Gas Program to procure RNG made by methane from organic waste from landfills and other sources, reduce the volume of LFG being flared, and help reduce greenhouse gas (GHG) emissions from the FRB Landfill. The RNG plant will have the capacity to process 6,000 scfm of LFG is equivalent to avoiding the GHG emissions from 60,196 tons of landfilled waste each year.

2.2.2 Operations

The proposed RNG systems are intended to support continuous operation with appropriate equipment and components. To support minimal staffing, the Plant will be automated to allow station operations as detailed in Table 2-2 and below. Under normal conditions, maintenance personnel will be on-site for site inspections and maintenance only as needed, and typically only during daylight hours.

Table 2-2. General Plant Operations

Parameter	Design Requirements
Operation Staff	Manned operations: A total of 10 Bowerman Power employees, 8-10 hours per day/5 days per week Unmanned/remote operations: 14-16 hours per day/5 days per week, and 24-hours/2 days per week
Service Life	20 years (approximately 2026 to 2046)
Shut Down	Depressurize to facility off-spec flare and landfill flares
Shut Down Sequence	Automated
Start Up Sequence	Semi-Automated
Planned Shut Down Time	Minimize annual down time
Turn Down	Losses in recovery efficiency are expected and acceptable to achieve turn down Two-stage public service announcement system maximum turndown is 75% (25% of nameplate capacity)

The RNG Plant will be supplied LFG from the existing flare station for upgrading into RNG. The RNG Plant will be designed to produce RNG that meets the Product Gas Composition requirements as set forth pursuant to SoCalGas' Rule Number 30[1].

The RNG Plant will have two buildings: an Electric Building, which is planned to be unoccupied, and a Control Building, which will be occupied by the operational staff, see Figures 2-7 and 2-8. The process equipment will be placed outside on the RNG Plant pad. The Control Building will house the Control Center (computer stations), lavatories, and the Electric Building will house the electrical room. The type of equipment expected for operation of the RNG Plant is shown in Figure 2-10, Equipment List.

The POR facility, see Figure 2-9, will be 8,000 square feet and include an electrical shelter, analyzer shelter, automated control valve(s), filter separator, meter, odorant skid, above-ground piping and pipe supports, bollards, fencing, roadways, and gates. The POR's equipment and their function are briefly described below:

- **Electrical Shelter:** The electrical shelter provides power to the POR's electrical equipment, gas instrumentation, and communication controls.
- **Analyzer Shelter (or Gas Analyzer System):** The analyzer shelter samples and analyzes incoming RNG, from the RNG Plant, to evaluate gas composition and quality. If inlet gas qualities deviate from the allowable limits, the analyzer shelter will trigger the overpressure protection valve to close and rejected gas will be routed back to the RNG Plant for re-processing or flaring. Once permissible gas composition and quality are confirmed by the

[1] SoCalGas Renewable Natural Gas Quality Standards, https://www.socalgas.com/1443740736978/gas-quality-standards-one-sheet.pdf

analyzer shelter, the overpressure production valve will open, and gas will be allowed into the POR station.

- **Automated Control Valve(s):** The control valves regulate the gas pressure of the RNG that is injected into SoCalGas' existing natural gas infrastructure.
- **Filter Separator:** The filter separator separates incoming particulates, entrained liquids, and RNG entering the POR facility and allows for dry gas to flow into the flow meter.
- **Metering (or Flow Metering):** The flow meter calculates the corrected gas flow of the RNG entering the POR facility.
- **Odorant Skid (or Odorizing System):** The odorizing system injects odorant into the RNG stream prior to injection into SoCalGas' existing natural gas infrastructure. Odorant is injected as a safety provision to make a gas leak readily detectable by sense of smell. The odorant skid contains a 250-gallon odorant storage tank, two expansion tanks, two injection pumps, two verometers, and four odorant filters.
- **Above-Ground Piping and Pipe Supports:** The above-ground piping and pipe supports transport the RNG through the POR facility and allow for SoCalGas personnel to perform future maintenance on the facility.
- **Bollards, Fencing, Roadways, and Gates:** The bollards, fencing, roadways, and gates protect the POR facility from vehicle collision and unauthorized access.

Normal operational power will be provided by Southern California Edison (SCE) service. In case of SCE power outage, a natural gas generator will be onsite to power critical facility safety and control systems. The generator will be used for temporary back-up power only.

2.2.3 Safety and Operability

The Project will be designed for normal operation from the Control Building, but with the ability to have both local and remote startup, operation, shutdown, and emergency shutdown capabilities for equipment. Emergency eyewash and/or safety shower stations (meeting ANSI/ISEA Z358.1 standards) will be provided. The process equipment area will include a gas detection system.

2.2.4 Water Use

The Project will use an estimated 350,000 gallons of non-potable water during construction activities (soil compaction, dust suppression, etc.). Non-potable water for construction activities will either be supplied from existing on-site FRB Landfill water tanks or trucked in from an off-site provider. Initially during operations, the RNG Plant system will require 1,000 gallons of water to supply the chiller system. Typically, no additional water will be required for the system except in the case of non-routine maintenance. Personal Potable water usage (bathroom, sink, shower, etc.) is estimated to be 110,000 gallons per year. Per Bowerman Power's agreement with OCWR, water for RNG Plant maintenance and personal water use will be supplied by OCWR from the existing domestic water line that currently serves the Bowerman Power Plant.

2.2.5 Construction Details

Construction is anticipated to begin in the first quarter of 2025 and is expected to occur over a span of 2 years, with the majority of the emitting construction phases overlapping during a 1-year period.

All Project equipment and building materials staging will occur on-site within the construction site work zones.

Non-hazardous waste and excess debris will be disposed of at the FRB Landfill.

Construction of the RNG Plant will include approximately 313 working days of construction and the new SoCalGas Pipeline will include approximately 239 working days of construction during normal working days and hours (Monday through Friday, except federal holidays). The construction labor force will vary from a minimum of 2 to a maximum of 35 workers per day for the duration of the construction activities. The type of heavy construction equipment expected for construction of the RNG Plant and the new SoCalGas pipeline is shown in Figure 2-10.

The approximately 3.52-acre Project site will require grading for the approximately 2.3-acre RNG Plant pad, see Figure 2-11. The pad will be composed of approximately 1.38 acres concrete and 0.22 acres of graded land. The pad is expected to require approximately 70,000 cubic yards of fill material, which will be extracted from an existing soil stockpile area within the FRB Landfill boundaries (see Figure 2-3). The soil stockpile area was previously graded as part of FRB Landfill Master Development Plan development and is currently used as the soil stockpile area for the soils excavated as part of the Phase VIII-A development.

An additional 0.8 acre will be cleared of vegetation, see the area shown in red and yellow on Figure 2-11, to comply with Orange County Fire Authority's (OCFA's) Fuel Modification and Maintenance Program. Another 0.05 acre will be cleared of vegetation and trenched for installation of a fire suppression water line. Post construction, the areas shown in red, blue, and yellow on Figure 2-11 will be revegetated with low fuel vegetation approved by OCFA and OCWR.

Construction of the new SoCalGas pipeline route will take place along Bee Canyon Access Road and Portola Parkway. The majority of the pipeline installation construction activities will use open-trench techniques within the paved sections of the roadways, with horizontal directional drilling techniques in some locations. The construction work area along the proposed pipelines will be approximately 50 feet wide. The disturbance for trenching activities will be approximately 30 inches wide with an average depth of 6 feet.

SoCalGas plans to perform a Horizontal Directional Drilling (HDD) operation along Bee Canyon Access Road to install approximately 1,300 feet of 12.7-inch steel pipeline beneath the Highway 241 Transportation Corridor. The entry and exit workspaces will be located on private property outside of Caltrans Right of Way (see Figure 2-4, Sheets 4 and 5, and Figure 2-12). The HDD entry workspace will be approximately 150 feet by 100 feet in size and located within the "dirt lot" adjacent to the west-bound lane of Bee Canyon Access Road, approximately 600 feet northeast from the center of the "Bee Canyon Access Rd. Bridge" or Bridge #55-785. The HDD exit workspace will be approximately 150 feet by 60 feet in size and will be located along Bee Canyon Access Road, approximately 800 feet southwest from the center of the "Bee Canyon Access Rd. Bridge." The maximum excavation depths for both the HDD entry and exit workspaces should not exceed 10 feet.

The HDD process can be divided into four main phases: pilot hole, reaming, swabbing, and pullback. The pilot hole will be approximately 10 inches in diameter and will drill a complete profile from entry

to exit locations. During the reaming and swabbing phases, the pilot hole will be expanded to a minimum of 18 inches. The final hole size will be determined by the HDD contractor. Prior to the pullback phase, the steel pipeline will be hydrostatically tested and upon completion, will be pulled into the hole. A bentonite mixture will be placed downhole to solidify and fill the void space and cap the ends of the entry and exit holes. The approved material will be determined by the drilling contractor and any permitting conditions. An estimated 100 cubic feet of drill mud waste will be produced during the HDD operation. All HDD waste will be disposed of offsite at an appropriate landfill site. The specific construction approach for the crossing of the Highway 241 Transportation Corridor is preliminary and subject to change depending on permitting conditions and requirements.

A traffic control plan will be prepared to accommodate this work area corridor along the new SoCalGas pipeline route.

2.2.6 Mitigation Measures

The following mitigation measures have been incorporated into the scope of work for the proposed Project and will be fully implemented by Bowerman Power to avoid or minimize adverse environmental impacts identified in this Initial Study/Mitigated Negative Declaration. These mitigation measures are identified in the Mitigation Monitoring and Reporting Plan (MMRP) prepared for this Project (see Appendix A) with the assigned responsibility for implementation and reporting.

Mitigation Measures:

BIO-1 To address potential Project impacts to intermediate mariposa lily (*Calochortus weedii* var. *intermedius*), an in-lieu fee shall be paid via minor amendment to the NCCP/HCP, as approved by USFWS and CDFW. The in-lieu fee will contribute to a management and monitoring program for rare plants in the Nature Reserve of Orange County.

Silt fencing or flagging shall be installed under the guidance of a biological monitor along the limits of coastal sage scrub areas that are immediately outside of the grading/impact limits. The silt fencing/flagging shall be used to minimize impacts to sensitive natural resources including special-status plant species and native plant communities outside and immediately adjacent to the grading limits. Construction activities and personnel will be restricted within these adjacent coastal sage scrub areas and a biological monitor will be present during the silt fence/flagging installation and removal.

BIO-2 Impacts to coastal sage scrub habitat shall occur outside the breeding and nesting season of the coastal California gnatcatcher (February 15 through July 15) to the extent practicable.

A pre-construction survey shall be conducted within the Project site to determine the presence/absence of coastal California gnatcatcher and coastal cactus wren prior to clearing or grading activities. The survey shall include a 100-foot buffer around the grading limits. Any coastal California gnatcatcher or coastal cactus wren observations shall be recorded and marked on the construction/grading plans.

All coastal sage scrub habitat outside of the Project impact area shall be fenced or marked with flagging materials prior to the commencement of grading. No construction access, parking, or storage of equipment or materials will be allowed within these areas.

A qualified biologist shall conduct and document a pre-construction meeting to educate construction staff (including supervisors, equipment operators, and other site employees) on all mitigation measures required for the Project.

A qualified biologist shall monitor the clearing of coastal sage scrub and oak woodland. USFWS/CDFW shall be notified at least 7 calendar days (preferably 14 calendar days) prior to clearing habitat occupied by Target/Identified Species, if observed. The qualified biologist will ensure that clearing activities and earth-moving equipment do not harm coastal California gnatcatchers or coastal cactus wren. The biologist will also ensure that these activities do not harm other species that may occur, including western spadefoot, orange-throated whiptail, red-diamond rattlesnake, and coast patch-nosed snake.

The access road(s) shall be sprayed with water on occasion to reduce dust accumulation on the leaves of coastal sage scrub species, as overseen by the biological monitor.

BIO-3 Avoid ground-disturbing and vegetation removal activities during the nesting bird season (February 15 to September 15). If these activities must occur during the nesting season, a pre-construction nesting bird survey shall be conducted by a qualified biologist on and within 300 feet of the Project construction area. The survey shall be conducted no more than 10 days prior to initiation of ground-disturbance, vegetation clearing, or construction activities and repeated between delays of greater than 10 days during the nesting season.

If an active nest is found, an appropriate no-disturbance buffer for the species shall be visibly established in the field by a qualified biologist (e.g., flagging, staking, caution tape). No ground-disturbing or vegetation removal activities shall occur within the buffer until the nesting season has ended or the nest is vacated and juveniles have fledged, as determined by the qualified biologist. At the discretion of a qualified biologist, limited encroachment into the buffer may occur for non-listed bird species but no disturbance of active nests or nesting activities is allowed per the Migratory Bird Treaty Act.

CUL-1 **Environmental Training** – Prior to construction of the Project, a Secretary of Interior-qualified archaeologist shall be retained by Bowerman Power to serve as the Project Archaeologist. Cultural resource awareness training shall be provided by the Project Archaeologist that includes all applicable laws and penalties pertaining to disturbing cultural resources, a brief discussion of the prehistoric and historic regional context and archaeological sensitivity of the area, types of cultural resources found in the area, and instruction that Project workers shall halt construction if a cultural resource

is inadvertently discovered during construction, and Project personnel contact information in the event of an inadvertent discovery.

CUL-2 **Archaeological Monitoring** – A qualified Archaeological monitor acceptable to the OCWR shall be retained by Bowerman Power prior to Project-related ground disturbance. The selection of the qualified professional(s) shall be subject to OCWR acceptance based on generally accepted professional qualifications and certifications, as applicable. A qualified Archaeological Monitor shall have at least a BS or BA degree in anthropology, archaeology, historic archaeology, or a related field and previous monitoring experience. The monitors shall conduct on-site daily archaeological monitoring of construction ground disturbance. The Archaeological monitor will provide daily documentation of construction activity and any findings. The Archaeological monitor shall prepare a daily monitoring log and submit it daily to the Project Archaeologist via email, briefly describing the field conditions, construction progress and activities, non-compliance activities, and record any finds of archaeological material. A final report summarizing the monitoring activities shall be prepared by the Project Archaeologist.

CUL-3 **Monitoring and Inadvertent Discovery Plan** – Prior to the start of construction, a Secretary of Interior-qualified Project Archaeologist (retained by Bowerman Power) shall prepare a Monitoring and Inadvertent Discovery Plan (Plan) for the Project. The Plan shall be submitted to OCWR for review and approval prior to the start of construction. The Plan shall include at a minimum:

- Overview of mitigation measures and responsibility for compliance;
- Project description of construction activities and maps;
- Description of relevant laws and regulations;
- Brief cultural context information and types and description of cultural resources that could be inadvertently discovered;
- Description of how monitoring shall occur;
- The roles and responsibility of the Archaeological Monitor (e.g., authority to halt construction for an inadvertent discovery, daily monitoring, daily reporting, etc.) and Project Archaeologist (e.g., oversee monitors, response to inadvertent discovery, final reporting, etc.);
- Description of protocols in the event of an inadvertent discovery (i.e., halt work) and notification procedures and contact list; and
- Description of final monitoring report.

Stop work protocols shall be implemented in the event of an inadvertent discovery of cultural resources. If a cultural resource is encountered within the new SoCalGas pipeline route, halt work protocols shall include notifying the SoCalGas Project

Archaeologist Ryan Glenn or SoCalGas Archaeologist Tricia Dodds and OCWR Environmental Engineering Specialist, Weena Dalby. See contact information below. Cultural resources shall not be relocated without consultation with a SoCalGas Archaeologist.

GEO-1 **Worker Education Program.** The project proponent shall retain a qualified paleontologist, defined as a paleontologist meeting the Society for Vertebrate Paleontology's Professional Standards (SVP 2010), to carry out all mitigation measures related to paleontological resources. The qualified paleontologist shall conduct the following:

a. Prior to the start of any ground disturbing activities, the qualified paleontologist shall conduct a Paleontological Resources Awareness Training program for all construction personnel working on the project site. A Paleontological Resources Awareness Training Guide approved by the qualified paleontologist shall be provided to all personnel. A copy of the Paleontological Resources Awareness Training Guide shall be submitted to the OCWR. The training guide may be presented in video form.

b. Paleontological Resources Awareness Training may be conducted in conjunction with other awareness training requirements.

c. The training shall include an overview of potential paleontological resources that could be encountered during ground disturbing activities to facilitate worker recognition, avoidance, and subsequent immediate notification to the qualified paleontologist for further evaluation and action, as appropriate; and penalties for unauthorized artifact collecting or intentional disturbance of paleontological resources.

d. The project operator shall ensure all new employees who have not participated in earlier Paleontological Resources Sensitivity Trainings shall meet the provisions specified above.

e. The Paleontological Resources Awareness Training Guides shall be kept available for all personnel to review and be familiar with as necessary.

GEO-2 **Project Monitoring.** A qualified paleontologist or designated monitor shall be onsite initially to spot-check excavations below a depth of one foot below the ground surface in areas of undetermined paleontological potential. If it is determined that sediments consist of older alluvium, then full-time paleontological monitoring shall ensue within that area. If sediments are determined to consist of Holocene Quaternary alluvium, paleontological monitoring shall not be required unless an excavation depth of 15 feet below the ground surface is reached in the area. The use of post-driving or rotary drilling shall not require monitoring.

a. The duration and timing of monitoring shall be determined by the qualified paleontologist in consultation with OCWR and shall be based on a review of geologic maps and grading plans.

b. During the course of monitoring, if the paleontologist can demonstrate based on observations of subsurface conditions that the level of monitoring should be reduced, the paleontologist, in consultation with OCWR, may adjust the level of monitoring to circumstances, as warranted.

c. Paleontological monitoring shall include inspection of exposed rock units during active excavations within sensitive geologic sediments. The qualified paleontologist shall have authority to temporarily divert excavation operations away from exposed fossils to collect associated data and recover the fossil specimens if deemed necessary.

d. Following the completion of construction, the paleontologist shall prepare a report documenting the absence or discovery of fossil resources onsite. If fossils are found, the report shall summarize the results of the inspection program, identify those fossils encountered, recovery and curation efforts, and the methods used in these efforts, as well as describe the fossils collected and their significance. A copy of the report shall be provided to OCWR and to an appropriate repository such as the Natural History Museum of Los Angeles County.

GEO-3 Inadvertent Discoveries of Paleontological Resources — If construction staff or others observe previously unidentified paleontological resources during ground disturbing activities, they will halt work within a 200-foot radius of the find(s), delineate the area of the find with flagging tape or rope (may also include dirt spoils from the find area), and immediately notify a qualified paleontologist. Construction will halt within the flagged or roped-off area. The paleontologist shall assess the resource as soon as possible and determine appropriate next steps in coordination with OCWR. Such finds shall be formally recorded and evaluated. The resource shall be protected from further disturbance or looting pending evaluation.

TCR-1 Should evidence of human remains be discovered during project construction, the Orange County Coroner (OCC) shall be immediately notified of the discovery. Evidence of human remains requires mandatory compliance with the provisions of State Health and Safety Code Section 7050.5, which restricts further disturbance in the vicinity of the discovery, defined herein as a 50-foot radius, until the OCC has made a determination within two business days of the origin and disposition pursuant to Public Resources Code Section 5097.98. If the remains are determined to be Native American, the OCC shall notify the Native American Heritage Commission (NAHC) within 24 hours that remains have been discovered. The NAHC shall determine the identity of the Most Likely Descendant (MLD). The MLD shall complete the inspection of the remains within 48 hours of notification by the NAHC. In addition, per CR-02, SoCalGas Project Archaeologist Ryan Glenn (425) 213-2349 (cell) and

RGlenn1@scgcontractor.com or SoCalGas Archaeologist Tricia Dodds (213) 290-7449 (cell) and TDodds@socalgas.com will be notified of the discovery.

TCR-2 If unanticipated tribal cultural resources or deposits are discovered during earth-moving activities, the following measures shall be implemented:

- All work shall halt within a 200-foot radius of the discovery. a qualified professional archaeologist shall assess the significance of the find (if a tribal cultural monitor is not present). If the resources are Native American in origin, the OCWR shall coordinate with the Tribe regarding evaluation, treatment, curation and preservation of these resources. The archaeologist shall have the authority to modify the no-work radius as appropriate, using professional judgment in consultation with OCWR. Work shall not continue within the no-work radius until the archaeologist conducts sufficient research, evidence and data collection to establish that the resource is either: (1) not cultural in origin; or (2) not potentially eligible for listing on the California Register of Historical Resources.

TCR-3 Tribal Cultural Resource Monitor: Prior to the issuance of any grading permit in which soil would be disturbed, Montauk shall provide evidence in the form of an executed Agreement to OCWR that they have retained a qualified Native American tribal monitor to provide third-party monitoring during excavation and grading activities and to recover and catalogue tribal resources as necessary. The tribal monitor shall be from or approved by the Kizh Nation. The agreement shall include (i) professional qualifications for the tribal cultural resource monitor(s); (ii) detailed scope of services to be provided including but not limited to pre-construction education, observation, evaluation, protection, salvage, notification, and/or curation requirements, as applicable, with final documentation/monitoring report to OCWR, as applicable; (iii) contact information; (iv) communication protocols between Contractor and Tribal Cultural Resource Monitor; (v) acknowledgment that if the Kizh Nation monitor is not available, Montauk or their contractor as designee may contract with another qualified tribal monitor acceptable to the OCWR. The selection of the qualified professional(s) shall be subject to OCWR acceptance based on generally accepted professional qualifications and certifications, as applicable. The cover sheet of the grading plans shall include a note to identify that third party tribal monitoring is required during excavation and grading activities in accordance the with the OCWR Agreement.

2.3 Project Objectives

The objectives of the Project include the following:

- Safely produce RNG from LFG that is natively created by the FRB Landfill and deliver it to SoCalGas;
- Allow for the beneficial reuse of existing and future LFG collected by FRB Landfill in a manner that furthers the long-term sustainability goals of the area;

- Provide the most feasible and cost-effective method of transporting LFG from FRB Landfill to SoCalGas;
- Assist Orange County in reducing its dependence on fossil fuels and become more sustainable and energy independent;
- Contribute to goals of the California Public Utilities Commission Renewable Gas Procurement Standard to procure RNG made by methane from organic waste from landfills and other sources;
- Reduce the amount of LFG being flared at the FRB Landfill;
- Reduce and quantify greenhouse gas (GHG) emissions from the FRB Landfill; and
- Minimize adverse environmental impacts.

2.4 Incorporation By Reference

Various technical studies, analyses, and reports were used in the preparation of this IS and are incorporated by reference in accordance with Section 15150 of the CEQA Guidelines. Information from these documents, which have been incorporated by reference, has been briefly summarized in the appropriate section(s) of this IS. The documents and other sources used in preparation of this IS are identified in Section 5.0, References.

2.5 Other Public Agencies Whose Approval Is Required

Other public agencies whose approval is expected to be required in the form of permits, financing approval, or participation agreements are as follows:

- South Coast Air Quality Management District – Permit to Construct (RNG Plant - Bowerman Power, new SoCalGas pipeline – SoCalGas), Dust Control (RNG Plant - Bowerman Power, new SoCalGas pipeline – SoCalGas), Plan Permit to Operate (RNG Plant - Bowerman Power)
- Santa Ana Regional Water Quality Control Board – Stormwater Pollution Prevention Plan for construction activities and development discharge (RNG Plant - Bowerman Power, new SoCalGas pipeline – SoCalGas)
- County of Orange – Conditional Use Permit (RNG Plant - Bowerman Power), Construction Permits (RNG Plant - Bowerman Power), Encroachment/Development Permit (new SoCalGas pipeline - SoCalGas)
- USFWS – coordination regarding NCCP (RNG Plant - Bowerman Power)
- CDFW – coordination regarding NCCP (RNG Plant - Bowerman Power)
- City of Irvine – Conditional Use Permit, Right of Way Permits, Construction Permits (new SoCalGas pipeline - SoCalGas)
- Caltrans – Encroachment Permit (SoCalGas new pipeline HDD construction- SoCalGas)
- Irvine Ranch Water District - Encroachment/Development Permit (SoCalGas new pipeline construction- SoCalGas)

2.6 Tribal Cultural Resources Consultation

In conformance with Assembly Bill 52 Tribal Consultation Requirements, OCWR notified the Native American Tribes/Tribal representatives that are traditionally and culturally affiliated with the Project area. OCWR sent Project notification to the following Tribes on August 15, 2023:

- Kizh Nation
- Juaneño Band of Mission Indians
- San Gabriel Band of Mission Indians
- Soboba Band of Luiseño Indians

One Native American Tribe, the Kizh Nation, requested consultation on this Project. Following this request, representatives from the Tribe and staff from OCWR engaged in consultation via telephone conference on October 17, 2023. OC Waste & Recycling sent the cultural resources report for the Project on May 24, 2024. The Kizh Nation representative provided comments on the report on May 28, 2024. These comments were incorporated into the cultural report and the final report was shared with the Tribe on July 8, 2024, and consultation was completed and closed out.

Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process (see Public Resources Code [PRC] Section 21083.3.2). Information may also be available from the California Native American Heritage Commission's (NAHC) Sacred Lands File per PRC Section 5097.94 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that PRC Section 21082.3(c) contains provisions specific to confidentiality.

3.0 ENVIRONMENTAL CHECKLIST

3.1 Environmental Factors Potentially Affected

The environmental factors checked would be potentially affected by this Project, involving impacts that are a "Potentially Significant Impact" 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 & Hazardous Materials
☐ Hydrology/Water Quality	☐ Land Use/Planning	☐ Mineral Resources
☐ Noise	☐ Population/Housing	☐ Public Services
☐ Recreation	☐ Transportation	☒ Tribal Cultural Resources
☐ Utilities/Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance

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

On the basis of this initial evaluation:

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

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

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

☐ I find that the proposed project MAY have a "potentially significant 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 (EIR) 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 Date

Print Name

3.3 Evaluation of Environmental Impacts

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

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

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

(4) "Negative declaration: less than significant with mitigation incorporated" applies when the incorporation of mitigation measures has reduced an effect from a "potentially significant impact" to a "less than significant impact." The lead agency must describe the mitigation measures and briefly explain how they reduce the effect to a less than significant level.

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

   a. Earlier analysis used. Identify and state where earlier analyses are available for review.

   b. Impacts adequately addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c. Mitigation measures. For effects that are "less than significant with mitigation incorporated," describe the mitigation measures that were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

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

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

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

(9) The explanation of each issue should identify:

a. The significance criteria or threshold, if any, used to evaluate each question, and

b. The mitigation measure identified, if any, to reduce the impact to a less than significant level.

3.4 Environmental Impact Analysis

3.4.1 Aesthetics

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

Existing Conditions:

Orange County, with its varied topography and proximity to the ocean, has many scenic areas including beaches, coastal bluffs, ridgelines, and hillsides (County of Orange 2012).

The Project site is located in an existing landfill and is surrounded by land designated as open space. The City of Irvine, located to the west, is a largely built-out urban setting characterized by residential, municipal, commercial, and light industrial uses.

The nearest state-designated scenic highway is a 4.2-mile segment of State Route 91 from State Route 55 east to the city limits of Anaheim (Caltrans 2023) and is over 10 miles to the northwest of the Project site.

The County of Orange General Plan Transportation Element identifies the County's scenic highway routes and divides designated scenic highways into two categories: Viewscape Corridors and Landscape Corridors (County of Orange 2020a). A viewscape corridor is a route that traverses a corridor within which unique or unusual scenic resources and aesthetic values are found. A landscape corridor traverses developed or developing areas and has been designated for special treatment to provide a pleasant driving environment as well as community enhancement.

The Scenic Highway Plan identifies Landscape Corridors and Viewscape Corridors. The nearest Landscape Corridor is El Toro Road, approximately 5 miles southeast of the Project site. The nearest Viewscape Corridor is Santiago Canyon Road, approximately 2.6 miles east of the Project site.

The City of Irvine General Plan Land Use Element, Figure A-4, Scenic Highways, identifies major views towards the northeast from Sand Canyon Avenue, approximately 2.6 miles southwest of the Project site, and Jeffery Road, approximately 1.8 miles southwest of the Project site.

Discussion:

a. Would the project have a substantial adverse effect on a scenic vista?

No Impact. The Project RNG Plant will be located at an existing active solid waste landfill and the new SoCalGas pipeline will be located within roadways from the POR within the RNG Plant boundary, down Bee Canyon Access Road to the existing SoCalGas pipeline on the corner of Portola Parkway and Jeffery Road. Neither are located not located within a scenic vista. The Project would not block views of any of the nearby open space and hills. Therefore, there would be no impacts to scenic vistas associated with implementation of the proposed Project.

Mitigation Measures: No mitigation is required.

b. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. Due to intervening terrain, views of the Project RNG Plant would not be available from any of the State, County, or City designated scenic highways. The new SoCalGas pipeline will be located within roadways and not visible. Therefore, there would be no impacts to designated scenic highways associated with implementation of the proposed Project.

Mitigation Measures: No mitigation is required.

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

Less Than Significant Impact. The new SoCalGas pipeline will be located within roadways and not visible, and therefore would not impact scenic quality. The Project RNG Plant is located within the FRB Landfill boundaries with an Orange County General Plan designation of 4LS (Public Facilities; Landfill Site) and a zoning designation of A1 General Agriculture. Because the property is owned by the County of Orange, the Project is exempt from the provisions of the Orange County Zoning Code, pursuant to Orange County Codified Ordinance, Ordinance No. 99-02, Section 2, Section 7-9-20(i). The proposed Project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project.

The viewshed for a project is generally the area that is visible from an observer's viewpoint and includes the screening effects of intervening vegetation and/or physical structures. Although some portion of the Project RNG Plant may be visible, the degree of visibility would depend on distance and view angle. Generally, the Project RNG Plant would be most visible from viewpoints within 2 miles, while site visibility would diminish as distance increases and view angle decreases. Air quality, including dust and other visible particulates, can affect visibility in the area. Distance is only one of the

factors that determine visibility of a site from a viewpoint. Terrain, vegetation, and structural features can obscure views that might otherwise be available at a certain distance.

A viewshed analysis is a graphic representation of locations that may have views of all or portions of a project based on topography within the area of project potential visibility. A viewshed analysis is a graphic representation of the seen and unseen areas adjacent to a project based on topography. A viewshed analysis was conducted for the Project using Esri ArcGIS geographic information system (GIS) software with the Spatial Analyst extension to process 10-meter digital elevation models, and the height of the tallest Project element, the thermal oxidizer (Figure 3.4-1, Project Zone of Visual Influence and Key Observation Points). The height of the thermal oxidizer would be up to a maximum of 55 feet. The viewshed assumed "bare earth" conditions and was run from the Project area looking out to determine areas with potential visibility. The assumed "bare earth" conditions mean identification of areas with potential views of the Project RNG Plant were based on surrounding topography only. The analysis is very conservative because it does not account for screening by intervening structures, vegetation, curvature of the earth, small terrain changes, atmospheric conditions and attenuation, or other features. The area of project potential visibility shown in the viewshed analysis was used to assist with the identification of potential key observation points (KOPs).

KOPs are one or a series of points on a travel route or at a use area or potential use area, where the view of a management activity would be most revealing. Based on the area of project potential visibility and the identification of publicly accessible routes and viewpoints, potential KOPs were identified and further assessed during the field evaluation. KOPs were identified based on locations from which the Project RNG Plant infrastructure would potentially be visible and noticeable to the casual observer. The "casual observer" is considered an observer who is not actively looking or searching for the Project RNG Plant, but who is engaged in activities at locations with potential views of the Project RNG Plant, such as hiking or driving along a scenic road. If the Project RNG Plant infrastructure is not noticeable to the casual observer, visual impacts can be considered minor to negligible.

Four KOPs were selected as representative vantage points in the landscape that offer motorists traveling on area roadways, local residents, pedestrians, and hikers, views of the proposed Project RNG Plant site (Figure 3.4-1, Project Zone of Visual Influence and Key Observation Points). These KOPs provide potential views of the Project RNG Plant site from publicly accessible areas.

Factors considered in the selection of KOPs included locations with sensitive viewers (e.g., local residences. pedestrians, and hikers and motorists on nearby roadways) and potential for the Project RNG Plant to be visible (e.g., distance and view angle). The KOPs were selected to capture representative vantages from local roadways, residences, and hiking trails.

The proposed Project would involve temporary changes to the visual character of the new SoCalGas pipeline and both temporary and permanent changes to the visual character of the RNG Plant site. Temporary changes are associated with construction activities, including construction equipment, staging, and Project construction. These visual impacts would be short term in nature and are not considered to be significant.

Digital photographs were taken from the selected KOP locations to support the discussion on existing visual setting and the analysis of potential visual impacts associated with the implementation of the proposed Project. Photographs of existing conditions were taken on August 11, 2023, using a digital single-lens reflex Nikon D5600 DSLR camera.

Three-dimensional (3D) visual simulations from representative KOP photographs were rendered to approximate the visual conditions caused by Project implementation. Using the photographs acquired at each KOP, a 3D physical massing model was created that incorporated the Project RNG Plant model. The model was then georeferenced and placed on global positioning system (GPS)-controlled, site-specific photographs to create simulations that demonstrate visual changes from the Project RNG Plant. Note the model included a building for the equipment area. With subsequent refinements to Project RNG Plant design, the equipment area will no longer be enclosed. The unenclosed equipment area will be less visible than the original equipment building; therefore, the simulations present a more conservative result than is expected. Figures 3.4-2 through 3.4-5 present existing and simulated views of Project RNG Plant features.

Key Observation Point 1

KOP 1 is located near the intersection of Chinon and Cadence in Irvine, approximately 3 miles southwest of the Project RNG Plant site. This KOP depicts views oriented north toward the Project RNG Plant site. As shown in Figure 3.4-2, the existing landscape setting is characterized by an urban environment with relatively flat to hilly terrain. Existing structural features include roadway and sidewalk, street lighting, and signs, fencing, and residential buildings in the distance. Vegetation includes grasses, ruderal vegetation, and trees. Dominant colors for the landscape are tans, browns, and greens, while the structures are gray, white, green, and black. The vegetation consists of irregular, organic forms with irregular-shaped ruderal vegetation and trees. The linear and horizontal lines associated with the structures are visible and prominent from this viewpoint. This KOP provides a typical view for drivers and pedestrians traveling along Chinon. Considering the short duration of viewing, viewers would have a low viewer sensitivity to the visual changes in the area.

The Project RNG Plant would not be visible from this location because of the screening of the Project RNG Plant site by structures (see Figure 3.4-2). As the Project RNG Plant would not be visible from this location, there would be no visual impacts from KOP 1.

Key Observation Point 2

KOP 2 is located near the Intersection of Episode and Pusan Way in Irvine, approximately 2.7 miles southwest of the Project RNG Plant site. This KOP depicts views oriented north toward the Project RNG Plant site. As shown in Figure 3.4-3, the existing landscape setting is characterized by an urban environment with relatively flat to hilly terrain. Existing structural features include roadway, street lighting, fencing, and residential buildings. Vegetation includes grasses, ruderal vegetation, and trees. Dominant colors for the landscape are tans, browns, and greens, while the structures are gray, white, red, and black. The vegetation consists of irregular, organic forms with irregular-shaped ruderal vegetation and trees. The linear and horizontal lines associated with the structures are visible and

prominent from this viewpoint. This KOP provides a typical view for drivers and pedestrians traveling along Episode and the occupants of the residences along Episode.

The Project RNG Plant would not be visible from this location because of the screening of the Project RNG Plant site by residential structures (see Figure 3.4-3). As the Project RNG Plant would not be visible from this location, there would be no visual impacts from KOP 2.

Key Observation Point 3

KOP 3 is located on the Portola Overlook Trail at the Portola Expedition Monument, near the Intersection of Portola Springs and Modjeska, approximately 1.7 miles south of the Project RNG Plant site. This KOP depicts views oriented north toward the Project RNG Plant site. As shown in Figure 3.4-4, the existing landscape setting is characterized by an urban environment with relatively flat to hilly terrain. Existing structural features include school buildings and playground, residential buildings, walls, lighting, roadways, toll road infrastructure, the Bowerman Power Plant exhaust stacks, and the FRB Landfill flares. Vegetation includes grasses and trees. Dominant colors for the landscape are tans, browns, and greens, while the structures are tan, gray, white, and red. The vegetation consists of irregular, organic forms with contiguous grasses and irregular-shaped trees. The linear and horizontal lines associated with the structures are visible and prominent from this viewpoint. This KOP provides a typical view for users of the Portola Overlook Trail and the occupants of the residences adjacent to the trail.

The Project RNG Plant would introduce white and gray colors, geometric shapes, and horizontal and vertical lines into the landscape setting. However, the Project RNG Plant would be barely visible from this location because of the screening of the Project RNG Plant site by terrain, vegetation, the Bowerman Power Plant, and the flare station and would not attract the attention of a casual observer (see Figure 3.4-4). The surrounding hilly terrain dominates the view, and what little can be seen of the Project is visually consistent with the adjacent the existing Bowerman Power Plant and the flare station.

For views from users of the Portola Overlook Trail and the occupants of the residences adjacent to the trail, the Project RNG Plant, while appearing as new and visible features, would be barely visible and would not attract attention of the casual viewer. Therefore, the impacts would be less than significant.

Key Observation Point 4

KOP 4 is located in the Portola Springs Nature Preserve, adjacent to Tomato Springs, approximately 1.3 miles south of the Project RNG Plant site. This KOP depicts views oriented north toward the Project RNG Plant site. As shown in Figure 3.4-5, the existing landscape setting is characterized by an urban environment with hilly terrain. Existing structural features include residential buildings, walls, lighting, toll road infrastructure, and the Bowerman Power Plant exhaust stacks. Vegetation includes grasses, shrubbery, and trees. Dominant colors for the landscape are tans, browns, and greens, while the structures are tan, gray, white, and red. The vegetation consists of irregular, organic forms with contiguous grasses and irregular-shaped shrubbery and trees. The linear and horizontal lines associated with the structures are visible and prominent from this viewpoint. This KOP provides a typical view for users of the trails in the Portola Springs Nature Preserve.

The Project RNG Plant would introduce white and gray colors, geometric shapes, and horizontal and vertical lines into the landscape setting. However, the Project RNG Plant would be barely visible from this location because of the screening of the Project RNG Plant site by terrain, vegetation, and the Bowerman Power Plant and the flare station and would not attract the attention of a casual observer (see Figure 3.4-5). The adjacent residential development and the surrounding hilly terrain dominate the view, and what little can be seen of the Project is visually consistent with the adjacent the existing Bowerman Power Plant and the flare station.

For views from users of the trails in the Portola Springs Nature Preserve, while appearing as new and visible features, the Project RNG Plant would be barely visible and would not attract attention of the casual viewer. Therefore, the impacts would be less than significant.

Mitigation Measures: No mitigation is required.

d. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Less Than Significant Impact. There are two primary sources of light: light emanating from building interiors that pass-through windows, and light from exterior sources (e.g., street lighting, parking lot lighting, building illumination, security lighting, and landscape lighting). Light introduction can be a nuisance to adjacent uses and diminish the view of the clear night sky.

The Project would involve the addition of lighting at the RNG Plant similar to the existing Bowerman Power Plant and the flare station. The amount of light produced at the Project's RNG Plant site would be the minimum required for safety and security purposes. The lights on the site would be designed to direct the light toward the site to reduce nuisance lighting.

Glare can result from natural sunlight reflecting from a shiny surface that would interfere with the performance of an off-site activity, such as the operation of a motor vehicle. Reflective surfaces can be associated with window glass and polished surfaces. The Project would not include materials that are highly reflective or that would produce substantial glare. The RNG buildings will be painted with an earth-tone, non-reflective color scheme. The outside equipment will not include materials that are highly reflective or that would produce substantial glare. The steel structures will have surfaces that are mechanically brushed or otherwise treated to reduce glare.

Therefore, a less than significant impact from the standpoint of light and glare would occur.

Mitigation Measures: No mitigation is required.

3.4.2 Agriculture And Forest Resources

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

Existing Conditions:

On the Farmland Mapping and Monitoring Program Map for California (California Department of Conservation 2023), the FRB Landfill is designated as Urban and Built-Up Land, which is generally described as land occupied by structures that has a variety of uses including residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes. The area surrounding the landfill is designated as Other Lands, which is generally described as land not included in any other mapping category.

Discussion:

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

No Impact. According to the Farmland Mapping and Monitoring Program Map for California, the Project RNG Plant site and new SoCalGas pipeline route are in an area designated as Urban and Built-Up Land. No Prime or Unique Farmland, or Farmland of Statewide Importance exists within the Project site or vicinity; therefore, no impact would occur.

Mitigation Measures: No mitigation is required.

b. Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?

No Impact. The zoning for the remaining part of the new SoCalGas pipeline route within the City of Irvine is not defined as the pipeline is in roadway. While the Project RNG Plant site and part of the new SoCalGas pipeline route have a zoning designation of A1 General Agriculture, its General Plan Designation is 4LS (Public Facilities Landfill Site) and there are no agricultural uses within the Project limits or adjacent areas. The Project would not convert farmland or conflict with any land zoned for agriculture. No Williamson Act contracts apply to the Project site (P&D Consultants 2006). Therefore, no impact would occur.

Mitigation Measures: No mitigation is required.

c. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in PRC Section 12220(g)) or timberland (as defined in PRC Section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No Impact. There are no forest land or timberland resource designations or forest land or timberland resource uses within the Project RNG Plant site or new SoCalGas pipeline route. Therefore, no impact would occur.

Mitigation Measures: No mitigation is required.

d. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. There are no forest land or timberland resource designations or forest land or timberland resource uses within the Project RNG Plant site or new SoCalGas pipeline route. Therefore, no impact would occur.

Mitigation Measures: No mitigation is required.

e. Would the project 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. There is no farmland or forest land located within or near the Project RNG Plant site and new SoCalGas pipeline route. The Project does not involve changes to the FRB Landfill boundary or zoning. Therefore, the Project would not involve any changes that could result in the loss or conversion of farmland or forest land to other uses. No impact would occur.

Mitigation Measures: No mitigation is required.

3.4.3 Air Quality

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?			X	
b.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?			X	
c.	Expose sensitive receptors to substantial pollutant concentrations?			X	
d.	Result in other emissions (such as those leading to odors) affecting a substantial number of people?			X	

An air quality impact study was conducted for the Project and is provided in Appendix B. The following summarizes the results and conclusions.

Existing Conditions:

Table 3-1 presents the maximum observed ambient background data for each pollutant and averaging time at the nearest representative monitoring station for the most recent data available. The nearest monitoring sites with available data (Central Orange County and Downtown Los Angeles) are located in an area that likely has higher ambient pollutant concentrations than the proposed Project site. The tabulated values were used to represent background levels for the indicated pollutants and averaging times in the Air Quality Impact Assessment (AQIA) to evaluate compliance with the California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS). The monitoring data indicates that air quality in the Project area complies with all NAAQS and CAAQS for NO2, CO, and SO2. However, the CAAQS and NAAQS are periodically exceeded in the Project area for PM2.5 and PM10.

Table 3-1. AQIA Background Concentrations

Pollutant	Averaging Time	Standard	Monitoring Station	Ambient Background Data (concentration units)				AAQS (concentration units)	Exceeds Standard?	Background Concentration Notes
				2020	2021	2022	Summary			
NO_2 (Concentration Units = ppb)	1-Hour	California	SCAQMD; Central Orange County	70.9	67.1	53	70.9	180	No	Highest of most recent 3 years.
	Annual	Federal	SCAQMD; Central Orange County	13.3	12.4	11.8	13.3	53	No	Highest of most recent 3 years.
		California	SCAQMD; Central Orange County	13.3	12.4	11.8	13.3	30	No	Highest of most recent 3 years.
CO (Concentration Units = ppm)	1-Hour	Federal	SCAQMD; Central Orange County	2.3	2.1	2.4	2.4	35	No	Highest of most recent 3 years.
		California	SCAQMD; Central Orange County	2.3	2.1	2.4	2.4	20	No	Highest of most recent 3 years.
	8-Hour	Federal	SCAQMD; Central Orange County	1.7	1.5	1.4	1.7	9	No	Highest of most recent 3 years.
		California	SCAQMD; Central Orange County	1.7	1.5	1.4	1.7	9	No	Highest of most recent 3 years.
SO_2 (Concentration Units = ppb)	1-Hour	Federal	EPA; Main St, Los Angeles	3	2	2	2.3	75	No	The design value (=3-year average of 99th percentile of 1-hour daily max).
		California	EPA; Main St, Los Angeles	3.8	2.2	6.5	6.5	250	No	Highest of most recent 3 years.
	24-Hour	California	EPA; Main St, Los Angeles	0.9	1.2	1.2	1.2	40	No	Highest of most recent 3 years.
PM_{10} (Concentration Units = µg/m^3)	24-Hour	Federal	SCAQMD; Central Orange County	120	115	90	120	150	No	Highest of most recent 3 years.
		California	SCAQMD; Central Orange County	120	115	90	120	50	Yes	Highest of most recent 3 years.
	Annual	California	SCAQMD; Central Orange County	23.9	22.9	22.3	23.9	20	Yes	Highest of most recent 3 years.

Pollutant	Averaging Time	Standard	Monitoring Station	Ambient Background Data (concentration units)				AAQS (concentration units)	Exceeds Standard?	Background Concentration Notes
				2020	2021	2022	Summary			
$PM_{2.5}$ (Concentration Units = $\mu g/m^3$)	24-Hour	Federal	SCAQMD; Central Orange County	27.10	36.70	22.10	28.63	35	No	The design value (=3-year average of 98th percentile of 24-hour daily max).
	Annual	Federal	SCAQMD; Central Orange County	11.27	11.4	9.87	11.4	9	Yes	Highest of most recent 3 years.
		California	SCAQMD; Central Orange County	11.27	11.4	9.87	11.4	12	No	Highest of most recent 3 years.

Notes: SCAQMD = South Coast Air Quality Management District

Discussion:

a. Would the project conflict with or obstruct implementation of the applicable air quality plans?

Less Than Significant Impact. The Project site (RNG Plant site and new SoCalGas pipeline route) is located in the South Coast Air Basin, comprising all of Orange County and the non-desert regions of Los Angeles, Riverside, and San Bernardino Counties. The South Coast Air Quality Management District (SCAQMD) is the agency primarily responsible for comprehensive air pollution control in the South Coast Air Basin and reducing emissions from area and point sources, mobile, and indirect sources. The SCAQMD prepared the 2022 Air Quality Management Plan (AQMP) to meet federal and State ambient air quality standards. The 2022 AQMP contains a comprehensive list of pollution control strategies directed at reducing emissions and achieving ambient air quality standards. These strategies are developed, in part, based on regional population, housing, and employment projections prepared by the Southern California Association of Governments (SCAG). SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and addresses regional issues relating to transportation, the economy, community development, and the environment. With regard to future growth, SCAG has prepared the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (2020-2045 RTP/SCS), which provides population, housing, and employment projections for cities under its jurisdiction. These growth projections are based in part on projections originating under County and City General Plans. These growth projections were utilized in the preparation of the air quality forecasts and consistency analysis included in the 2022 AQMP. The 2020-2045 RTP/SCS was approved in September 2020.

The 2022 AQMP was adopted by the SCAQMD Governing Board on December 2, 2022, as a program to lead the South Coast Air Basin into compliance with several criteria pollutant standards and other federal requirements. It relies on emissions forecasts based on demographic and economic growth projections provided by SCAG's 2020-2045 RTP/SCS. SCAG is charged by California law to prepare and approve "the portions of each AQMP relating to demographic projections and integrated regional land use, housing, employment, and transportation programs, measures and strategies." Projects whose growth is included in the projections used in the formulation of the AQMP are considered to be consistent with the plan and not to interfere with its attainment. The SCAQMD recommends that, when determining whether a project is consistent with the current AQMP, a lead agency must assess whether the project would directly obstruct implementation of the plan and whether it is consistent with the demographic and economic assumptions (typically land use-related, such as resultant employment or residential units) upon which the plan is based.

A significant air quality impact may occur if a project is inconsistent with the AQMP or would in some way represent a substantial hindrance to employing the policies or obtaining the goals of that plan. As shown in Table 3-2, the incremental emissions from the proposed Project do not exceed the SCAQMD's established thresholds of potential significance for air quality impacts. The proposed Project would provide a beneficial use for the LFG generated at the landfill and would be consistent with the goals and objectives of the AQMP. Therefore, the Project would not increase the frequency or severity of an air quality standards violation or cause a new violation. Furthermore, the Project is consistent with the land use and zoning designation through development of the proposed Project.

Table 3-2. AQIA Modeling Results for Project Operations

Pollutant	Averaging Time	Federal or State Standard	Modeled Concentration[1] (Concentration Units)	Background Concentration (Concentration Units)	Modeled + Background Concentration (Concentration Units)	CEQA Threshold (Concentration Units)	Significance
NO_2 (Concentration Units = ppb)	1-Hour	California[2]	0.825[F]	70.9	71.7	180	LTS
	Annual	Federal	0.027[E]	13.3	13.3	53	LTS
		California	0.027[E]	13.3	13.3	30	LTS
CO (Concentration Units = ppm)	1-Hour	Federal	0.003[F]	2.4	2.4	35	LTS
		California	0.003[F]	2.4	2.4	20	LTS
	8-Hour	Federal	0.001[F]	1.7	1.7	9	LTS
		California	0.001[F]	1.7	1.7	9	LTS
SO_2 (Concentration Units = ppb)	1-Hour	Federal	2.135 [F]	2.3	4.4	75	LTS
		California	2.341[F]	6.5	8.8	250	LTS
	24-Hour	California	0.612[E]	1.2	1.8	40	LTS
PM_{10} (Concentration Units = µg/m^3)	24-Hour	SCAQMD CEQA Significant Change Threshold	0.068[E]	–	–	2.5	LTS, modeled concentration is less than significant change threshold.
	Annual		0.010[E]	–	–	1	
$PM_{2.5}$ (Concentration Units = µg/m^3)	24-Hour		0.068[E]	–	–	2.5	

Notes:

1. Superscript E indicates elevated terrain AERMOD run; superscript F indicates flat terrain AERMOD run.
2. The modeled concentration presented is the model predicted maximum hourly value using full NO2 conversion.

Because the Project would be consistent with the City's General Plan, it is also consistent with the regional growth projections adopted in the 2022 AQMP. Air quality emissions generated by the proposed Project are considered to be evaluated in the AQMP, and Project development in accordance with the City's General Plan would not conflict with or obstruct implementation of the regional 2022 AQMP. Thus, the proposed Project is not expected to conflict with or obstruct the implementation of the AQMP and SCAQMD rules. Therefore, impacts would be less than significant, and no mitigation is required.

Mitigation Measures: No mitigation is required.

b. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Less Than Significant Impact. To evaluate impacts, quantitative significance criteria established by the local air quality agency, such as the SCAQMD, may be relied upon to make significance determinations based on mass emissions of criteria pollutants.

A significant impact would occur if the proposed Project would violate any air quality standard or contribute substantially to an existing or projected air quality violation. Project construction emissions were estimated using CalEEMod, the statewide land use emissions computer model designed to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from land use projects. According to the CalEEMod model results, as outlined in this report, overall construction (maximum daily emissions) for the proposed Project would not exceed the SCAQMD thresholds for the criteria pollutants ROG, NOx, CO, oxides of sulfur (SOx), and respirable and fine particulate matter (PM10 and PM2.5, respectively). As shown in Table 3-3, the Project is estimated to generate less than the SCAQMD threshold of 75 pounds per day ROG, 100 pounds per day NOx, 550 pounds per day CO, 150 pounds per day SOx, 150 pounds per day PM10, and 55 pounds per day PM2.5 during the construction phase.

Table 3-3. Construction Emissions Summary and Significance Evaluation

Criteria Pollutants	Construction Emissions (pounds/day)	Threshold (pounds/day)	Significance
ROG (VOC)	11.1	75	LTS
NOx	56.8	100	LTS
CO	50.0	550	LTS
SOx	0.16	150	LTS
Total PM10	24.9	150	LTS
Total PM2.5	6.5	55	LTS

Sources: SCAQMD 2023, CalEEMod version 2022.1.1.26. Yorke Engineering, LLC, 2024, see Appendix B,
Notes: Pounds/day are winter or summer maxima for planned land use. Total PM10/PM2.5 comprises fugitive dust plus engine exhaust.

The primary sources of operations phase emissions are the three stationary sources (i.e., thermal oxidizer, flare, and Internal Combustion Engine), on-road vehicles traveling to and from the site buildings, and operational activities such as landscape equipment, consumer products, and energy use. As shown in Table 3-4, the Project is estimated to generate less than the SCAQMD threshold of 55 pounds per day ROG, 55 pounds per day NOx, 550 pounds per day CO, 150 pounds per day SOx, 150

pounds per day PM10, and 55 pounds per day PM2.5 during the operational phase. As shown in Table 3-4, line G, the proposed Project will reduce emissions of criteria pollutants as compared to existing conditions.

Table 3-4. Operational Emissions Summary and Significance Evaluation

Emission Source		Criteria Pollutant Emissions on Peak Operating Day [8] (pounds/day)					
		VOC	NOx	CO	SOx[9]	PM10[10]	PM2.510
[A]	Baseline Existing LFG Flare Emissions [1] (6,000 scfm LFG)	25.92	108.00	259.20	124.01	52.70	52.70
[B]	Proposed TOU[2]	4.34	25.29	57.81	124.26	5.16	5.16
[C]	Proposed Flare[3]	0.01	0.14	0.14	0.00	0.01	0.01
[D]	Proposed Engine[4]	0.11	0.70	1.17	0.00	0.07	0.07
[E]	Proposed Miscellaneous Operational Sources[5]	0.75	0.32	1.59	0.00	0.12	0.05
[F] = [B + C + D + E]	**Proposed Project[6]**	**5.22**	**26.46**	**60.72**	**124.27**	**5.37**	**5.29**
[G] = [F] - [A]	**Proposed Project - Baseline Existing LFG Flare Emissions**	**-20.70**	**-81.54**	**-198.48**	**0.25**	**-47.34**	**-47.34**
[H]	SCAQMD Mass Daily Thresholds for Operation[7]	55	55	550	150	150	150
[G] > [H]	Significance	LTS	LTS	LTS	LTS	LTS	LTS

[1] Baseline is calculated as the emissions from flaring 6,000 scfm LFG (~180 mmBtu/hr) for 24 hours at the Flare I-6 emission factors.

[2] Proposed Time of Use (TOU): 2,315 scfm Tail Gas 1 (~6.4 mmBtu/hr) + 885 scfm Tail Gas 2 (~6.1 mmBtu/hr) + 280 scfm Supplemental Fuel (~17.6 mmBtu/hr), 24 hours. Note: RNG Plant inlet compression removes approximately 400 scfm moisture from the incoming LFG. The RNG Plant is projected to generate on the order of 2,400 scfm RNG. Tail Gas 1 + Tail Gas 2 + RNG = 2,315 scfm + 885 scfm + 2,400 scfm = 5,600 scfm. RNG Plant Inlet – Moisture Removal = 6,000 scfm – 400 scfm = 5,600 scfm.

[3] Proposed Flare: ~1.6 scfm Supplemental Fuel for natural gas pilot light (0.1 mmBtu/hr), 24 hours.

[4] Proposed Engine: Engine is natural gas fired and used for maintenance and testing.

[5] Proposed Miscellaneous Operational Sources: Includes Mobile, Area, and Energy sources from CalEEMod.

[6] Proposed Project: Proposed TOU + Proposed Flare + Proposed Engine + Proposed Miscellaneous Operational Sources.

[7] Source: SCAQMD (2023).

[8] Peak operating day with emergency engine usage is shown here. A typical day would not involve emergency generator usage, which is limited to maintenance and testing hours only.

[9] SOx EF is based on daily/hourly Best Available Control Technology (BACT) basis (85 ppm or 14.354 lb/mmscf). Proposed TOU SOx emissions include 100 percent of the Landfill Tail Gas SOx emissions + SOx from supplemental fuel. Proposed Flare SOx emissions include SOx from supplemental fuel.

[10] Total PM10 / PM2.5 comprises fugitive dust plus engine exhaust.

The proposed Project site is approximately 4.2 acres in SRA Zone 19 – Saddleback Valley. As a conservative estimate, the 2-acre screening lookup tables were used to evaluate NOx, CO, PM10, and PM2.5 impacts on nearby receptors. The nearest receptor is approximately 1,300 meters (4,200 feet) away from the proposed RNG Plant. Therefore, the impact evaluation was performed using the closest distance within SCAQMD Localized Significance Threshold (LST) tables of 500 meters for construction. As shown in in Table 3-5, on-site emissions from construction would meet the LST passing criteria at the nearest receptors (500 meters).

Table 3-5. Construction Localized Significance Threshold Evaluation

Criteria Pollutants	Construction Emissions (pounds/day)	Threshold (pounds/day)	Percent of Threshold	Result
NOx	56.8	233	24.4%	Pass
CO	50.0	8,454	0.6%	Pass
PM10	24.9	129	19.3%	Pass
PM2.5	6.5	74	8.7%	Pass

Sources: SCAQMD 2008a, CalEEMod version 2022.1.1.26.
Notes: SRA: Zone 19 – Saddleback Valley. 2-acre area, 500 meters to receptor.

Additionally, the AQIA conducted shows that operational activities would not cause an exceedance of the NO2, SO2, or CO NAAQS or CAAQS. Furthermore, the model-predicted PM10 and PM2.5 concentrations from the operational sources would not exceed the 24-hour and annual significant change thresholds (see Table 3-6). Thus, the proposed Project would not cause a violation of the NAAQS or CAAQS or contribute substantially to an existing air quality violation, and therefore, the proposed Project would have a less than significant impact on air quality.

SCAQMD Guidance

The SCAQMD's 2003 guidance on addressing cumulative impacts for air quality is as follows: "As Lead Agency, the SCAQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR [Environmental Impact Report]. […] Projects that exceed the project- specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant" (SCAQMD 2003).

CEQA Guidelines

As referenced above, the SCAQMD cumulative air quality significance thresholds are the same as the project-specific air quality significance thresholds. Because the criteria pollutant mass emissions impacts shown in Tables 3-3 through 3-6 would not be expected to exceed any of the SCAQMD air quality significance thresholds, cumulative air quality impacts from comparable development projects would also be expected to be less than significant. Therefore, potential adverse impacts from implementing the proposed Project would not be "cumulatively considerable" as defined by CEQA Guidelines Section 15064(h)(1) for air quality impacts. Per CEQA Guidelines Section 15064(h)(4), the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed Project's incremental effects would be cumulatively considerable.

As shown in Tables 3-3 through 3-6, the proposed Project would result in a less than significant impact related to regional emissions, and no mitigation is required.

Table 3-6. AQIA Modeling Results for Project Operations

Pollutant	Averaging Time	Federal or State Standard	Modeled Concentration/1 (Concentration Units)	Background Concentration (Concentration Units)	Modeled + Background Concentration (Concentration Units)	CEQA Threshold (Concentration Units)	Significance
NO2 (Concentration Units = ppb)	1-Hour	California/2	0.825F	70.9	71.7	180	LTS
	Annual	Federal	0.027E	13.3	13.3	53	LTS
		California	0.027E	13.3	13.3	30	LTS
CO (Concentration Units = ppm)	1-Hour	Federal	0.003F	2.4	2.4	35	LTS
		California	0.003F	2.4	2.4	20	LTS
	8-Hour	Federal	0.001F	1.7	1.7	9	LTS
		California	0.001F	1.7	1.7	9	LTS
SO2 (Concentration Units = ppb)	1-Hour	Federal	2.135 F	2.3	4.4	75	LTS
		California	2.341F	6.5	8.8	250	LTS
	24-Hour	California	0.612E	1.2	1.8	40	LTS
PM10 (Concentration Units = µg/m^3)	24-Hour	SCAQMD CEQA Significant Change Threshold	0.068E	–	–	2.5	LTS, modeled concentration is less than significant change threshold.
	Annual		0.010E	–	–	1	
PM2.5 (Concentration Units = µg/m^3)	24-Hour		0.068E	–	–	2.5	

/1 Superscript E indicates elevated terrain air quality dispersion modeling run; superscript F indicates flat terrain air quality dispersion modeling run.
/2 The modeled concentration presented is the model predicted maximum hourly value using full NO2 conversion.

Mitigation Measures: No mitigation is required.

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. A significant impact would occur if the proposed Project were to expose sensitive receptors to pollutant concentrations. The SCAQMD identifies the following as sensitive receptors: long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, and athletic facilities. There are residential land uses approximately 0.87 mile west of the Project site. The Project would be subject to grading and construction standards to mitigate air pollution and dust impacts.

A Health Risk Assessment (HRA) was conducted for Project, see Section 4.0 of Appendix B. The construction HRA results predict that all health risk factors would be less than the CEQA significance thresholds at all actual receptors. The operational HRA results predict that all health risk factors would be less than the CEQA significance thresholds at all actual receptors. As demonstrated by the HRA, the Project is not expected to substantially contribute to pollutant concentrations or expose surrounding residences and other sensitive receptors during construction or operation. The Project is required to meet SCAQMD Rule 403 requirements for controlling fugitive dust, as well as the City's

requirements for grading and construction related to air pollution. Therefore, construction and operation of the Project would result in a less than significant impact for both localized and regional air pollution emissions, and no mitigation is required.

Mitigation Measures: No mitigation is required.

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less Than Significant Impact. Potential sources that may emit odors during construction activities include equipment exhaust and architectural coatings. Odors from these sources would be localized and generally confined to the immediate area surrounding the Project site. The proposed Project would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. Construction of the proposed Project would not cause an odor nuisance. The proposed RNG Plant would not create odors because the LFG is being processed and compressed for shipment in the SoCalGas pipeline, and not released into the air. The byproducts of the treatment would be combusted at high temperatures just as it is currently being combusted in the existing flare station. The maintenance work on site also would not generate any significant odor. Therefore, the proposed Project would result in a less than significant impact related to objectionable odors, and no mitigation is required.

Mitigation Measures: No mitigation is required.

3.4.4 Biological Resources

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?			X	
c.	Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marshes, vernal pools, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			X	
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X	
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f.	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?				X

A biological resources report and wetlands delineation report were conducted for the Project and are provided in Appendix C. The following summarizes the results and conclusions.

Existing Conditions:

Readily available information, including relevant literature, databases, agency web sites, various previously completed reports and management plans, GIS data, topographic maps, aerial imagery from public sources, and in-house records were reviewed to:

1. Assess habitats, special-status plant and wildlife species, jurisdictional waters, Critical Habitat, and wildlife corridors that may occur in and near the Project site; and
2. Identify local or regional plans, policies, and regulations that may apply to the Project.

The following data sources were accessed during the literature review.

- **California Department of Fish and Wildlife**
  - California Natural Diversity Database (CNDDB; CDFW 2023a).

  - Biogeographic Information and Observation System (CDFW 2023b).
- **U.S. Fish and Wildlife Service**
  - Critical Habitat Portal (USFWS 2023a).
  - National Wetlands Inventory and Wetlands Mapper (USFWS 2023b).
- **California Native Plant Society**
  - Rare Plant Inventory (CNPS 2023).
- **Other**
  - County of Orange Municipal Codes.
  - Natural Community Conservation Plan/Habitat Conservation Plan for the Central/Coastal Subregion of Orange County (County of Orange 1996).

A biological field survey and jurisdictional wetlands delineation were conducted at the Project site on June 19 and 20, 2023, which included the proposed Project RNG Plant, Fuel Modification Area, and the proposed SoCalGas pipeline. Although imported soil for the RNG Plant pad will come from the existing stockpile area on the FRB Landfill, this area was not surveyed in 2023. This area is already disturbed, and impacts have been analyzed by a separate project. No new biological impacts are anticipated from obtaining soil from the existing stockpile.

The proposed Project RNG Plant and Fuel Modification Area is covered primarily by sagebrush scrub, with bands of coast live oak (*Quercus agrifolia*) habitat present. Sagebrush scrub covers about 73 percent of the Project RNG Plant and Fuel Modification Area. The dominant shrub within this habitat is California sagebrush (*Artemisia californica*). There is minimal to no tree canopy within this habitat. Coast live oak trees dominate along the slopes with an understory comprising non-native grasses. Within the sagebrush scrub and along the margins of the coast live oak habitat are populations of a California rare plant, intermediate mariposa lily (*Calochortus weedii* var. *intermedius*). In addition, within the bounds of the RNG Plant is an approximately 35-foot-wide, unvegetated concrete channel. Multiple smaller concrete-lined channels of approximately one-foot width run downslope from the existing Landfill Gas to Energy plant or Bee Canyon Road into the wider concrete channel. Soils covered in natural vegetation were generally loose and gravelly within the Project RNG Plant and vicinity, and small mammal burrows were sparse due to dense vegetation coverage.

The proposed pipeline impact area will be limited to the existing developed roads. Directly outside of the proposed pipeline area are some naturally occurring (i.e., sagebrush scrub) or naturalized habitats (i.e., eucalyptus [*Eucalyptus* sp.] grove), as well as artificial (i.e., ornamental trees) and disturbed habitats. Ornamental trees included typical roadside species such as acacias (*Acacia* spp.) and conifers (*Pinus* spp.).

One raptor species, red-tailed hawk (*Buteo jamaicensis*), was observed during the surveys, as well as other common bird species that may nest in the Project RNG Plant, Fuel Modification Area, or in the vicinity of the proposed pipeline such as Anna's hummingbird (*Calypte anna*), common raven (*Corvus corax*), northern mockingbird (*Mimus polyglottos*), and song sparrow (*Melospiza melodia*). However, no nests were observed during the survey. One reptile, western fence lizard (*Sceloporus occidentalis*), and

various common invertebrates were also observed such as honeybees (*Apis* sp.) and tarantula hawks (*Pepsis* sp.).

Discussion:

a. Would the project 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 the U.S. Fish and Wildlife Service?

Less Than Significant With Mitigation Incorporated. A query of the CDFW CNDDB and CNPS Rare Plant Inventory was conducted to determine known occurrences of candidate, sensitive, or special-status species or habitats within the Project site or vicinity (CDFW 2023a; CNPS 2023). The species presented in Table 3-7 are those with potential of occurring within or adjacent to the site. Species that do not have habitat in the Project site, such as freshwater marsh and open water habitats, have not been included in the table.

Table 3-7. Special-Status Species with Potential to Occur

Scientific Name	Common Name	Federal Status / State Status	Other Status
Plants			
Calochortus weedii var. *intermedius**	Intermediate mariposa-lily*	None / None	CRPR 1B.2, NCCP/HCP
Dudleya multicaulis	Many-stemmed dudleya	None / None	CRPR 1B.2
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass	None / None	CRPR 4.3
Monardella hypoleuca ssp. *intermedia*	Intermediate monardella	None / None	CRPR 1B.3
Amphibians			
Spea hammondii	Western spadefoot	None / SSC	NCCP/HCP
Reptiles			
Aspidoscelis hyperythra	Orange-throated whiptail	None / WL	NCCP/HCP
Crotalus ruber	Red-diamond rattlesnake	None / SSC	NCCP/HCP
Phrynosoma blainvillii	Coast horned lizard	None / SSC	None
Salvadora hexalepis virgultea	Coast patch-nosed snake	None / SSC	None
Birds			
Campylorhynchus brunneicapillus sandiegensis	Coastal cactus wren	None / SSC	NCCP/HCP
Icteria virens	Yellow-breasted chat	None / SSC	None
Polioptila californica californica	Coastal California gnatcatcher	FT / SSC	NCCP/HCP
Vireo bellii pusillus	Least Bell's vireo	FE / SE	NCCP/HCP

Notes:
* Intermediate mariposa-lily was observed during the biological survey within the Project RNG Plant in 2023.
FE = Federally Listed Endangered
FT = Federally Threatened
SE = State Listed Endangered
SSC = CDFW Species of Special Concern
WL = CDFW Watch List
NCCP/HCP = Central Coastal Subregion Natural Community Conservation Plan and Habitat Conservation Plan
California Native Plant Society, California Rare Plant Rank (CRPR)
1B = Plants Rare, Threatened, or Endangered in California and elsewhere
4 = Watch List: Plants of limited distribution
0.2 = Moderately threatened in California (20-80% occurrences threatened)
0.3 = Not very threatened in California (less than 20% of occurrences threatened)
Sources: CDFW 2023a, CNPS 2023.

The biological field survey conducted in June 2023 assessed habitats and potential occurrence of candidate, sensitive, or special-status species. One special-status species, intermediate mariposa lily, was found during the survey. Intermediate mariposa lily is a CNPS California Rare Plant Rank 1B.2 species and Conditionally Covered Species under the Central Coastal Subregion NCCP/HCP. A population of this species with a total of 17 individuals occurred within the center of the proposed RNG Plant. In addition, a population with two individuals was found outside the RNG Plant and Fuel Modification Area near the existing Landfill Gas to Energy plant and flare station. The individuals within the RNG Plant would likely be impacted during Project construction. No other rare plants were found during the survey.

The western spadefoot (*Spea hammondii*) is a CDFW Species of Special Concern (SSC) and an Identified Species under the NCCP/HCP that has been previously documented about 0.3 mile south of the RNG Plant (CDFW 2023a). The closest documented breeding habitat is about 1.5 miles northwest of the RNG Plant (CDFW 2023a). Although there are no pools within the RNG Plant and Fuel Modification Area that would allow for breeding, upland habitat is present that may support transient individuals moving from breeding habitat to estivating habitat. This species is unlikely to occur in all habitats within the proposed pipeline area.

Orange-throated whiptail (*Aspidoscelis hyperythra*) is a CDFW Watch List species and is a Target Species under the NCCP/HCP. This species has been previously recorded less than about 0.1 miles of the RNG Plant (CDFW 2023a). Preferred habitat characteristics for this species, including loose soils and coastal sage scrub and oak habitats, are present within the RNG Plant and Fuel Modification Area. This species may also occur adjacent to the proposed pipeline in sagebrush scrub areas.

Red-diamond rattlesnake (*Crotalus ruber*) is a CDFW SSC and an Identified Species under the NCCP/HCP. This species has been previously recorded about 2 miles northeast of the RNG Plant (CDFW 2023a). Preferred habitats for this species are present within the RNG Plant and Fuel Modification Area including sagebrush scrub and oak habitats, and adjacent to the proposed pipeline in sagebrush scrub areas.

Coast horned lizard (*Phrynosoma blainvillii*) is a CDFW SSC that has been recorded about 2 miles northeast of the RNG Plant (CDFW 2023a). Given the dense vegetation present throughout the RNG Plant and Fuel Modification Area, the lack of ants and other insect prey species, and that no visible burrows or burrowing species were observed, coast horned lizard is unlikely to occur.

The coast patch-nosed snake (*Salvadora hexalepis virgultea*) is a CDFW SSC that has been recorded about 2 miles northwest of the RNG Plant (CDFW 2023a). Preferred habitat characteristics for this species, including semi-arid brushy areas, are present within the RNG Plant, Fuel Modification Area, and adjacent to the proposed pipeline.

Special-status bird species that have been previously recorded within 2 miles of the RNG Plant include the following (CDFW 2023a): coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), yellow-breasted chat (*Icteria virens*), coastal California gnatcatcher (*Polioptila californica californica*), and least Bell's vireo (*Vireo bellii pusillus*). Minimal nesting habitat for coastal cactus wren occurs in the Project site but the species could forage on-site. Yellow-breasted chat and least Bell's vireo are

unlikely to occur on-site since preferred habitat in proximity to water is not present. The coastal California gnatcatcher could nest and forage in the Project site and vicinity.

The special-status species listed in Table 3-7 could be impacted by Project construction activities including ground disturbance or vegetation clearing if present on-site. Intermediate mariposa lily was found on-site and is covered in the NCCP/HCP. Per requirements in the NCCP/HCP, if less than 20 individuals of intermediate mariposa lily are observed in the impact area, no mitigation would be required. If more than 20 individuals are observed, mitigation would be required. Mitigation Measure **BIO-1** would assume presence of 20 intermediate mariposa lily individuals and require an in-lieu fee to be paid via minor amendment to the NCCP/HCP and installation of silt fencing or flagging. Wildlife species that have potential to occur at the Project site and vicinity that qualify as Target Species or Identified Species under the NCCP/HCP include western spadefoot, orange-throated whiptail, red-diamond rattlesnake, coastal cactus wren, coastal California gnatcatcher, and least Bell's vireo. Mitigation Measure **BIO-2** would require implementation of the Construction Minimization Measures required by the NCCP/HCP to minimize impacts to these species. Adhering to the requirements of the NCCP policies and procedures ensures no further mitigation is necessary. In addition, Mitigation Measure **BIO-3** would be implemented to protect raptors and nesting birds. Therefore, with implementation of mitigation measures **BIO-1, BIO-2,** and **BIO-3**, Project impacts to candidate, sensitive, or special-status species would be reduced to less than significant.

Mitigation Measures:

BIO-1 To address potential Project impacts to intermediate mariposa lily, an in-lieu fee shall be paid via minor amendment to the NCCP/HCP, as approved by USFWS and CDFW. The in-lieu fee will contribute to a management and monitoring program for rare plants in the Nature Reserve of Orange County.

Silt fencing or flagging shall be installed under the guidance of a biological monitor along the limits of coastal sage scrub areas that are immediately outside of the grading/impact limits. The silt fencing/flagging shall be used to minimize impacts to sensitive natural resources including special-status plant species and native plant communities outside and immediately adjacent to the grading limits. Construction activities and personnel will be restricted within these adjacent coastal sage scrub areas and a biological monitor will be present during the silt fence/flagging installation and removal.

BIO-2 Impacts to coastal sage scrub habitat shall occur outside the breeding and nesting season of the coastal California gnatcatcher (February 15 through July 15) to the extent practicable.

A pre-construction survey shall be conducted within the Project site and Fuel Modification Area to determine the presence/absence of coastal California gnatcatcher and coastal cactus wren prior to clearing or grading activities. The survey shall include a 100-foot buffer around the grading limits. Any coastal California

gnatcatcher or coastal cactus wren observations shall be recorded and marked on the construction/grading plans.

All coastal sage scrub habitat outside of the Project impact area shall be fenced or marked with flagging materials prior to the commencement of grading. No construction access, parking, or storage of equipment or materials will be allowed within these areas.

A qualified biologist shall conduct and document a pre-construction meeting to educate construction staff (including supervisors, equipment operators, and other site employees) on all mitigation measures required for the Project.

A qualified biologist shall monitor the clearing of coastal sage scrub and oak woodland. USFWS/CDFW shall be notified at least 7 calendar days (preferably 14 calendar days) prior to clearing habitat occupied by Target/Identified Species, if observed. The qualified biologist shall ensure that clearing activities and earth-moving equipment do not harm coastal California gnatcatchers or coastal cactus wren. The biologist shall also ensure that these activities do not harm other species that may occur, including western spadefoot, orange-throated whiptail, red-diamond rattlesnake, and coast patch-nosed snake.

The access road(s) shall be sprayed with water on occasion to reduce dust accumulation on the leaves of coastal sage scrub species, as overseen by the biological monitor.

BIO-3 Avoid ground-disturbing and vegetation removal activities during the nesting bird season (February 15 to September 15). If these activities must occur during the nesting season, a pre-construction nesting bird survey shall be conducted by a qualified biologist on and within 300 feet of the Project construction area. The survey shall be conducted no more than 10 days prior to initiation of ground-disturbance, vegetation clearing, or construction activities and repeated between delays of greater than 10 days during the nesting season.

If an active nest is found, an appropriate no-disturbance buffer for the species shall be visibly established in the field by a qualified biologist (e.g., flagging, staking, caution tape). No ground-disturbing or vegetation removal activities shall occur within the buffer until the nesting season has ended or the nest is vacated and juveniles have fledged, as determined by the qualified biologist. At the discretion of a qualified biologist, limited encroachment into the buffer may occur for non-listed bird species but no disturbance of active nests or nesting activities is allowed per the Migratory Bird Treaty Act.

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

Less than Significant. The CNDDB did not identify any CDFW sensitive natural communities in the Project site or vicinity (CDFW 2023a). The Project will impact 2.9 acres of sagebrush scrub in the proposed Project RNG Plant and Fuel Modification Area, which is a type of coastal sage scrub habitat covered by the NCCP/HCP. The NCCP/HCP has allocated a total of 206 acres of authorized coastal sage scrub "take" to occur within the FRB Landfill boundary after amendments to the NCCP/HCP. There is 38.74 acres of remaining take for future FRB Landfill Development phases, including Phases IX and X. The area of impact for this proposed Project is located entirely within Phase X of the FRB Landfill Development, which is projected to impact 25.41 acres of coastal sage scrub habitat. Therefore, the 2.9 acres of proposed impacts to coastal sage scrub from this Project can be accommodated from the OCWR available take credit. Although oak tree riparian habitat surrounding ephemeral drainages will also be impacted by the RNG Plant and Fuel Modification Area, participation in the NCCP/HCP provides a benefit to all habitat types in the sage scrub habitat mosaic, which includes riparian and oak woodlands. In addition, mature oak trees that would be impacted would be replaced off-site or a fee would be paid to the County as required in accordance with the County Tree Preservation Ordinance. Therefore, the proposed Project would have a less than significant impact on riparian habitat and other sensitive natural communities.

Mitigation Measures: No mitigation is required.

c. Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marshes, vernal pools, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less than Significant. Three drainage features under Regional Water Quality Control Board (RWQCB) and CDFW jurisdiction and one feature under only CDFW jurisdiction were identified in the proposed Project RNG Plant and/or Fuel Modification Area during the jurisdictional wetlands delineation. No features under U.S. Army Corps of Engineers (USACE) jurisdiction were identified. These four features are subject to the full impacts by the Project within the RNG Plant and Fuel Modification Area. FRB Landfill Development Phase X fully overlaps with the proposed Project. As such, the following USACE, RWQCB, and CDFW permits have been previously obtained that cover the Project:

- USACE Section 404 Permit (SPL-2006-00212).
- RWQCB Section 401 Permit (Reference No. SPL-2006-00212).
- CDFW Section 1602 Permit (1600-2005-0735-R5).

Impacts to these features are tentatively permitted with notification of any changes in the jurisdictional areas. Since the Project is covered within the total permitted impact area for FRB Landfill Development Phase X, no new permitting is anticipated to be required. Coordination with the agencies will occur to determine if adjustments in the permit acreages are necessary. Therefore, the proposed Project would have a less than significant impact on state or federally protected wetlands.

Mitigation Measures: No mitigation is required.

d. Would the project 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 wildlife nursery sites?

Less than Significant. Per the BIOS Habitat Connectivity Viewer, the Project RNG Plant and vicinity is located within a Natural Landscape Block but not within an Essential Connectivity Area (CDFW 2023b). Although the FRB Landfill is adjacent to large areas of open space (i.e., Limestone Canyon Nature Preserve, Irvine Ranch Natural Landmarks), the RNG Plant area is located near existing developed areas where human presence and noise may deter wildlife. Therefore, while the RNG Plant and vicinity may provide cover and forage for wildlife and migrating birds, it is unlikely to provide a significant wildlife movement corridor. The RNG Plant and Fuel Modification Area also consists of a relatively small footprint that would not substantially reduce habitat connectivity in the overall area; the ability of wildlife to move through adjacent areas would be unaffected. In addition, implementation of pre-construction nesting bird surveys and biological monitoring during vegetation clearing would ensure that wildlife nursery sites are not impacted. The proposed pipeline would occur entirely within the existing roadway and would not interfere with the existing movement of wildlife or impact any nursery sites. Therefore, impacts from the Project to the movement of any native resident or migratory wildlife species, established native resident or migratory wildlife corridors, or the use of native wildlife nursery sites would be less than significant.

Mitigation Measures: No mitigation is required.

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No Impact. The proposed project would not result in any conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Mitigation Measure: No mitigation is required.

f. Would the project conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The Project falls under the Central Coastal Subregion NCCP/HCP because the FRB Landfill is within the Central Subregion area of the NCCP Reserve. Projects within the NCCP/HCP area must comply with the NCCP/HCP requirements, including Construction Minimization Measures, pre-construction surveys, and associated mitigation plans if covered species are detected. All requirements of the NCCP/HCP would be followed by the Project including implementation of pre-construction surveys, mitigation plans if needed, and Construction Minimization Measures. Therefore, the proposed Project would not conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

Mitigation Measures: No mitigation is required.

3.4.5 Cultural Resources

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	Would the project:				
a.	Cause a substantial adverse change in the significance of a historical resource pursuant to in Section 15064.5?				X
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		X		
c.	Disturb any human remains, including those interred outside of formal cemeteries?				X

A cultural resources evaluation and records search was conducted and is provided as Appendix D. The following summarizes the results and conclusions.

Existing Conditions:

The prehistory of the southern California region has been summarized within four major horizons or cultural periods: Horizon I – Early Period (12,000 to 7,500 years before present [BP]), Horizon II – Millingstone Horizon (7,500 to 3,000 BP), Horizon III – Intermediate Cultures (3,000 to 1,000 BP), and Horizon IV – Late Prehistoric (1,000 BP to European historic contact).

The Project is within the ethnographic territory traditionally inhabited by the Kizh (Kisiannos) people. The Kizh occupied most of Los Angeles and Orange counties, parts of Riverside and San Bernardino counties, including the watersheds of the Los Angeles, San Gabriel, and Santa Ana rivers, the Los Angeles basin to the Santa Monica and Santa Ana mountains, along the coast from Aliso Creek in the south to Topanga Creek in the north, and the Channel Islands such as San Clemente, San Nicolas, and Santa Catalina.

European settlement began in 1771, when Spanish missionaries began to settle along the California coast and adjacent inland areas. Following the Mexican American War and secularization of the nearby missions in 1834, the region was transferred to private landowners (ranchos) who established a primary economy of cattle ranching. After the fall of the rancho system, European settlers purchased substantial land holdings in the area. In 1889, the Orange County seat was established ~~located~~ in Santa Ana and this further stimulated the development of businesses, stores, financial institutions and hotels serving the regional metropolitan population. Orchards and crops were plentiful and buying and selling of goods and land became the number one enterprise. By the 1930s, the Irvine Company implemented several irrigation projects to provide a stable source of water to the agricultural areas. Urban development (e.g., residential subdivisions and commercial) began to take root in the 1920s through current times. Today, Orange County is densely developed with urban uses and limited vacant land. The FRB Landfill was constructed in the 1980s and opened in 1990.

The Project lies within the Peninsular Ranges Geomorphic Province. Specifically, the Project is situated along the western canyons and foothills of Loma Ridge within the northwestern flank of the

Santa Ana Mountains (a northwest trending range). Elevations at Loma Ridge range from approximately 1,000 to 2,000 feet. Several ephemeral drainages are near the Project within Bee, Hicks, and Round Canyons. Geological deposits within the Project site and Project pipeline route consist of mostly marine sedimentary rocks with an age range from Miocene epoch (5 million to 23 million years old) back to the Eocene epoch (35 million to 55 million years old).

Soils within the Project site and eastern-most reach of the proposed SoCalGas pipeline route consist of Calleguuas clay loam from 0 to 7 inches in depth, very channery clay loam from 11 to 15 inches, and bedrock from 15 to 59 inches. Soils within the Project pipeline route (from east to west) consist primarily of Anaheim clay from 0 to 26 inches, weathered bedrock from 26 to 59 inches, a small segment of Cieneba sandy loam 0 to 17 inches, and weathered bedrock from 17 to 59 inches; and Sorrento loam 0 to 12 inches, silt clay loam 12 to 67 inches, and sandy loam 62 to 72 inches at the very western terminus of the route.

Sagebrush scrub covers about 73 percent of the Project RNG Plant site. The dominant shrub within the habitat is California sagebrush (*Artemisia californica*). Along the slope of the Project site, coast live oak dominates the tree canopy. The tree understory is composed of non-native grasses, like ripgut grass (*Bromus diandrus*) and foxtail chess (*Bromus madritensis*), and sparse coverage of low-growing sagebrush scrub species, like California buckwheat *(Eriogonum fasciculatum*). The proposed SoCalGas pipeline route encompasses Bee Canyon Access Road, Portola Parkway, and any structures in and along the road, such as fencing and gates. Habitat along the SoCalGas pipeline route includes disturbed areas along the roadside of Bee Canyon Access vegetated with primarily non-native ruderal species and sagebrush scrub.

The Santa Ana Mountain region supports a variety of wildlife such as mule deer (*Odocoileus hemionus*), desert cottontail (*Sylvilagus audubonii*), California ground squirrel (*Otospermophilus beecheyi*), mountain lion (*Felix concolor*), bobcat (*Lynx rufus*), coyotes (*Canis latrans*), and other small animals and rodents. Several avian species inhabited the region such as the greater roadrunner (*Geococcyx californianus*), red tailed hawk (*Buteo jamaicensis*), turkey vulture, (*Cathartes aura*), canyon wren (*Catherpes mexicanus*), and several others.

REGULATORY COMPLIANCE

Various state and local laws, ordinances, and regulations pertain to the protection of cultural resources. These are summarized briefly below.

- **California Environmental Quality Act.** CEQA (Section 21084.1) requires a lead agency to determine whether a project could have a significant effect on historical resources or tribal cultural resources (under Public Resources Code [PRC] Section 21074 [a][1][A]-[B]). Under the CEQA (Section 15064.5), a historic resource (e.g. buildings, structures, or archaeological resources) is a resource listed in, or determined to be eligible for listing in the California Register of Historical Resources (CRHR) or a local register or landmark, identified as significant in a historical resource survey (meeting the requirements of Section 5024.1(g) of the PRC), or any object, building, structure, site, area, place, record, or manuscript that a lead agency

determines to be historically significant (Section 15064.5[a][3]). Under the California Code of Regulations, Title 14, Chapter 11.5, properties listed on or formally determined to be eligible for listing in the National Register of Historic Places are automatically eligible for listing in the CRHR. A resource is generally considered to be historically significant under CEQA if it meets the criteria for listing in the CRHR (see PRC Section 5024.1, Title 14 California Code of Regulations, Section 5024.1).

- **California Health and Safety Code, Section 7050.5.** Section 7050.5 (a) states that it is a misdemeanor (except as provided in Section 5097.99, see below) to knowingly mutilate or disinter, wantonly disturb, or willfully remove any human remains in or from any location other than a dedicated cemetery without the authority of law. The provisions of this subdivision shall not apply to any person carrying out an agreement developed pursuant to subdivision (l) of Section 5097.94 of the PRC or to any person authorized to implement Section 5097.98 of the PRC. Section 7050.5 (b) requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If determined to be Native American, the coroner must contact the California NAHC.
- **California Native American Historical, Cultural, and Sacred Sites Act.** The California Native American Historical, Cultural, and Sacred Sites Act requires that upon discovery of human remains, construction or excavation activity cease and that the county coroner be notified. If the remains are Native American, the coroner must notify the NAHC. The NAHC will then identify and notify a most likely descendant (MLD). The Sacred Sites Act stipulates the procedures the MLD may follow for treating or disposing of the remains and associated grave goods.
- **California Public Resource Code, Section 5097.** PRC Section 5097 specifies the procedures to be followed in the event of an unexpected discovery of human remains on non-federal land. The disposition of Native American remains falls within the jurisdiction of the NAHC.
- **Assembly Bill 52.** Under CEQA, AB 52 requires a lead agency to consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a proposed project.
- **California State Senate Bill 18.** California State Senate Bill 18 requires cities and counties to notify and consult with California-recognized Native American Tribes about proposed local land use planning decisions for the purpose of protecting Traditional Tribal Cultural Places. The Governor's Office of Planning and Research was mandated to amend its General Plan Guidelines to include the stipulations of Senate Bill 18 and to add advice for consulting with California Native American Tribes.

Record Search Results

A record search of the cultural resources site and project file collection at the South-Central Coastal Information Center (SCCIC), California State University, Fullerton, of the California Historical Resources Information System, was conducted on August 23, 2023. The records search focused specifically on the proposed Project site and Project pipeline route and a quarter mile (0.25 mile)

buffer extending from the Project site boundary. The SCCIC record search results identified 21 previously conducted cultural resource studies that overlap and are within the Project site and Project pipeline route. These studies were conducted between 1978 and 2010 and consist of overviews, archaeological testing, excavation, and field surveys. Eleven previously conducted cultural resource studies were identified within 0.25 mile of the Project site and Project pipeline route.

Five previously recorded cultural resources were identified within 0.25 mile of the Project site and Project pipeline route.

Orange County General Plan Sensitivity Map

The County of Orange General Plan states that sub-surface resources such as archaeological and paleontological sites are abundant in Orange County. Based on the County of Orange General Plan Prehistoric Archaeology sensitivity map, the proposed Project site and Project pipeline route is located in areas mapped for prehistoric archaeological sensitivity.

Historic U.S. Geological Survey Map and General Land Office Plat Map and Historic Aerial Review

A review of historic maps and aerial imagery provides information regarding potential unrecorded historic features or sites within the Project Area. Based on the historic maps and aerial imagery review, the Project site and Project pipeline route appear relatively undeveloped until the 1980s. Based on aerial imagery, the areas near the southern portion of the Project pipeline route appear under agricultural use (row corps and orchards) from the 1940s to 1970s. By the 1980s, the FRB Landfill was under construction and Bee Canyon Access Road was improved (widened and paved) and the adjacent areas (including hillsides) were graded, cut, and terraced for erosion control with concrete culverts.

NAHC Sacred Lands Files Search

As part of the data collection, a NAHC Sacred Lands File Search was requested on July 20, 2023. The NAHC replied on August 21, 2023, and the results were negative. OCWR has initiated tribal consultation under Assembly Bill 52. Pursuant to notice provided on August 14, 2023, in accordance with PRC section 21080.3.1, the Kizh Nation (Tribe) requested consultation with Orange County regarding the Project, by letter dated August 25, 2023 (sent via email). Following this request, representatives from the Tribe and staff from OCWR engaged in consultation via telephone conference on October 17, 2023. OCWR then sent cultural resources report for the Project on May 24, 2024. The Kizh Nation representative provided comments on the report on May 28, 2024. These comments were incorporated into the cultural report and the final report was shared with the Tribe on July 8, 2024, and consultation was completed.

Discussion:

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to in Section 15064.5?

No Impact. The archival research conducted for the initial study determined that the Project site (RNG Plant site and new SoCalGas pipeline route does not contain any known historic resources as defined by the CEQA Guidelines. No impact would result.

Mitigation Measures: No mitigation is required.

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less than Significant With Mitigation Incorporation. A Phase I archaeological inventory was conducted for the Project. No archaeological resource material was observed. The SCCIC record search identified three previously recorded archaeological sites. Based on the background research and field survey, all three sites were impacted and appear destroyed because of this disturbance, no longer retain their integrity, and are recommended not eligible to the CRHR.

The development of the FRB Landfill and associated infrastructure has disturbed the natural surface and subsurface deposits of the proposed Project pipeline route and a small portion of the Project RNG Plant site. Although these soils are disturbed, they may still contain cultural material important to the tribe. In addition, intact cultural material may exist within undisturbed deposits. Potential impacts will be reduced to less than significant with the incorporation of mitigation measures CUL-1, CUL-2, and CUL-3.

Mitigation Measures:

CUL-1 Environmental Training – Prior to construction of the Project, a Secretary of Interior-qualified archaeologist shall be retained by Bowerman Power to serve as the Project Archaeologist. Cultural resource awareness training shall be provided by the Project Archaeologist that includes all applicable laws and penalties pertaining to disturbing cultural resources, a brief discussion of the prehistoric and historic regional context and archaeological sensitivity of the area, types of cultural resources found in the area, ~~and~~ instruction that Project workers will halt construction if a cultural resource is inadvertently discovered during construction, and Project personnel contact information in the event of an inadvertent discovery.

CUL-2 Archaeological Monitoring – A qualified Archaeological monitor acceptable to the OCWR shall be retained by Bowerman Power prior to Project related ground disturbance. The selection of the qualified professional(s) shall be subject to OCWR acceptance based on generally accepted professional qualifications and certifications, as applicable. A qualified Archaeological Monitor shall have at least a BS or BA degree in anthropology, archaeology, historic archaeology, or a related field and previous monitoring experience. The monitors shall conduct on-site daily archaeological monitoring of construction ground disturbance. The Archaeological monitor shall provide daily documentation of construction activity and any findings. The Archaeological monitor shall prepare a daily monitoring log and submit it daily to the Project Archaeologist via email, briefly describing the field conditions, construction progress and activities, non-compliance activities, and record any finds of archaeological material. A final report summarizing the monitoring activities shall be prepared by the Project Archaeologist.

CUL-3 Monitoring and Inadvertent Discovery Plan – Prior to the start of construction, a Secretary of Interior-qualified Project Archaeologist (retained by Bowerman Power) shall prepare a Monitoring and Inadvertent Discovery Plan (Plan) for the Project. The Plan shall be submitted to OCWR for review and approval prior to the start of construction. The Plan shall include at a minimum:

- Overview of mitigation measures and responsibility for compliance;
- Project description of construction activities and maps;
- Description of relevant laws and regulations;
- Brief cultural context information and types and description of cultural resources that could be inadvertently discovered;
- Description of how monitoring shall occur;
- The roles and responsibility of the Archaeological Monitor (e.g., authority to halt construction for an inadvertent discovery, daily monitoring, daily reporting, etc.) and Project Archaeologist (e.g., oversee monitors, response to inadvertent discovery, final reporting, etc.);
- Description of protocols in the event of an inadvertent discovery (i.e., halt work) and notification procedures and contact list; and
- Description of final monitoring report.
- Stop work protocols in the event of an inadvertent discovery of cultural resources. If a cultural resource is encountered within the new SoCalGas pipeline route, halt work protocols shall include notifying the SoCalGas Project Archaeologist Ryan Glenn or SoCalGas Archaeologist Tricia Dodds and OCWR Environmental Engineering Specialist, Weena Dalby. See contact information below. Cultural resources shall not be relocated without consultation with a SoCalGas Archaeologist.

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

No Impact. Existing regulations require that if human remains and/or cultural items defined by Health and Safety Code, Section 7050.5, are inadvertently discovered, all work in the vicinity of the find shall cease and the Orange County Coroner shall be contacted immediately. If the remains are found to be Native American as defined by Health and Safety Code, Section 7050.5, the coroner shall contact the NAHC by telephone within 24 hours. The NAHC shall immediately notify the person it believes to be the Most Likely Descendent (MLD) as stipulated by California PRC, Section 5097.98. The MLD(s), with the permission of the landowner and/or authorized representative, shall inspect the site of the discovered remains and recommend treatment regarding the remains and any associated grave goods. The MLD shall complete their inspection and make their recommendations within 48 hours of notification by the NAHC. Any discovery of human remains shall be treated in accordance with Section 5097.98 of the PRC and Section 7050.5 of the Health and Safety Code. with compliance with existing regulations, no Project impacts are expected.

Mitigation Measures: No mitigation is required.

3.4.6 Energy

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

Existing Conditions:

The LFG currently created by the FRB Landfill is managed via a gas collection and control system that includes vertical and horizontal gas extraction wells, a collection pipe system, and a flare station complex comprising six flares. The existing Bowerman Power Plant produces enough electricity to power 26,000 homes. The LFG not processed by the Bowerman Power Plant is incinerated at the flaring station.

Discussion:

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

b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less Than Significant Impact. According to the CEQA Guidelines, "[u]ses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified." Therefore, the purpose of this analysis is to identify any significant irreversible environmental effects of Project implementation that cannot be avoided.

Construction of the proposed Project RNG Plant and new SoCalGas pipeline would lead to the consumption of limited, slowly renewable, and non-renewable resources, committing such resources to uses that future generations would be unable to reverse. Project construction would require the commitment of resources that include: (1) building materials; (2) fuel; and (3) the transportation of goods and people to and from the proposed Project.

The construction for the proposed Project is expected to occur over a span of 2 years, with the majority of the emitting construction phases overlapping during a 1-year period. During Project

construction, energy will be consumed in the form of petroleum-based fuels associated with the use of construction vehicles and equipment on the Project site, construction worker travel to and from the Project site, and truck trips delivering building materials to the Project site. The commitment of resources required for the construction of the proposed Project would limit the availability of such resources for future generations or for other uses during the life of the Project. However, use of such resources will be short term and minimal during construction and will not result in energy consumption requiring a significant increase in energy production for the energy provider. The impact from the construction-related energy use would be less than significant.

During the operation of the Project, energy would be consumed as part of the RNG Plant operations. Processing operations for the Project would involve energy consumption for the various equipment at the RNG Plant, along with outdoor parking lot and security lighting. The consumption of such resources would represent a long-term commitment of those resources. However, the proposed Project will comply with all applicable regulations and codes that require achievement of various levels of energy efficiency in building design, construction, and operation.

As a result, while there would be an incremental increase in energy use with the proposed Project, such increases would be considered to be less than significant. The proposed Project would enable fuller utilization of the LFG gas generated at FRB Landfill that would otherwise be burned in the flares. The Project will contribute to California Public Utility Commission's Renewable Gas Program to procure RNG made by methane from organic waste from landfills and other sources, reduce the volume of LFG being flared, and help reduce greenhouse gas (GHG) emissions from the FRB Landfill. The RNG plant will have the capacity to process 6,000 standard cubic feet per minute of LFG which is equivalent to avoiding the GHG emissions from 60,196 tons of landfilled waste each year. Accordingly, there would be a less than substantial effect on operational energy and impacts related to operational energy use would be less than significant.

Mitigation Measures: No mitigation is required.

3.4.7 Geology and Soils

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	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.			X	
	ii.) Strong seismic ground shaking?			X	
	iii.) Seismic-related ground failure, including liquefaction?				X
	iv.) Landslides?			X	
b.	Result in substantial soil erosion or the loss of topsoil?			X	
c.	Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?			X	
d.	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?			X	
e.	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?			X	
f.	Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?		X		

Existing Conditions:

The Project RNG Plant site and new SoCalGas pipeline are in the foothills of the Santa Ana Mountains. The FRB landfill is located in a large topographic valley: Bee Canyon. The valley has formed in a complex geology of mostly marine sedimentary rocks with an age range from Miocene epoch (5 million to 23 million years in age) back to the Eocene epoch (35 million to 55 million years old). The FRB landfill encompasses rocks from the following formations (Morton 2004):

- **Puente Formation (early Pliocene and Miocene).** Marine sandstone, siltstone, and shale underlying most of the Puente Hills and extending into adjacent areas.
- **Topanga Formation (middle Miocene).** Marine sandstone, siltstone, and shale. At type locality, Topanga Canyon, unit contains middle Miocene fauna (fossils).
- **Vaqueros Formation (early Miocene, Oligocene, and late Eocene).** Predominantly sandstone, with thin-bedded shales and siltstones. Contains early Miocene shallow-water marine mega-fossil assemblages.

- **Sespe Formation (early Miocene, Oligocene, and late Eocene).** The Sespe formation can be varied in color from gray to red, is generally massive- to thick-bedded, nonmarine sandstones. In Sespe Creek, Ventura County, this formation conformably underlies marine sandstones of the Vaqueros formation. Continental vertebrate fossil collections originating from the Sespe formation range in age from Eocene to early Miocene.

The non-marine exception in these formations is the Sespe, which is also the underlying geology at the Project RNG site. The new SoCalGas pipeline originates in the Sespe formation but also crosses Vaqueros formation rocks as well as Quaternary sediments (both alluvial and landslide deposits). All but the Puente formation rocks are noted to contain fossils, with the Sespe known for continental vertebrate fossils.

The Project RNG Plant site and new SoCalGas pipeline alignment are not located within an Alquist-Priolo Earthquake Fault Zone (CGS 2023). The principal seismic hazard that could affect the site is ground shaking resulting from an earthquake occurring along any one of several major active faults in the region. The known regional faults that could produce the most significant ground shaking at the Project RNG Plant site and new SoCalGas pipeline include the San Andreas, San Jacinto, Whittier-Elsinore, and Newport-Inglewood Faults. The closest documented active fault to the FRB Landfill is the Elsinore-Glen Ivey Fault/Chino-Central Avenue strand, located approximately 10 miles east of the FRB landfill.

The FRB Landfill North End Landslide Emergency Remediation Project, located at the northern boundary of the FRB Landfill, was initiated in 2002 in response to major movement in a previously stable landslide complex that caused the area to fracture, buckle, and slide (OCWR 2014). In order to stall the landslide, the initial emergency action plan called for the removal of approximately 800,000 cubic yards of soil from the top of the slide area and the drilling of approximately 12,000 feet of horizontal drains to lower groundwater levels at the bottom of the slide. Since that time, additional surficial sliding has occurred on-site to the north, which required the removal of an additional 300,000 cubic yards of soil for a projected total of approximately 1.1 million cubic yards of soil removed. Also, an east flank of the North End Landslide has been identified and will also be remediated.

The Project site and new SoCal Gas pipeline are not located within a liquefaction zone (CGS 2023).

Discussion:

a. Would the project 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.

Less Than Significant Impact. The Project RNG Plant site and new SoCalGas pipeline are not located within an Alquist-Priolo Earthquake Fault Zone and no active faults are known to cross the Project site or the pipeline route. The probability of damage because of surface ground rupture is low due to the lack of known active faults crossing the Project area. Project facilities and the pipeline have been designed in accordance with applicable seismic safety standards. The operation of the proposed

Project, therefore, is not anticipated to expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death from the rupture of a known earthquake fault. The impact is anticipated to be less than significant.

Mitigation Measures: No mitigation is required.

ii.) Strong seismic ground shaking?

Less Than Significant Impact. The Project area is located within the seismically active Southern California region and is likely to experience strong ground shaking from seismic events generated on regionally active faults. The risk of structural damage from earthquake ground shaking is controlled by building and grading regulations. The California Building Code (CBC) mandates that the design for structures requiring building permits must take into account foundation conditions, proximity of active faults, and their associated ground shaking characteristics. Design-level geotechnical reports must include CBC seismic design parameters. Those parameters are used by the structural engineer in the design of above-ground structures and underground lines. With conservative design and high quality construction, ground shaking damage can be kept to a practical minimum. The Project has been designed in accordance with applicable seismic safety standards. The operation of the proposed Project (including the new pipeline), therefore, is not anticipated to expose people or structures to potential substantial adverse effects from strong seismic ground-shaking. The impact is anticipated to be less than significant.

Mitigation Measures: No mitigation is required.

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

No Impact. The Project site and pipeline route are not located within a liquefaction hazard zone. Construction of the Project will comply with applicable measures of the CBC regarding seismic safety measures. Operation of the proposed Project would not expose people or structures to substantial impacts involving seismic-related ground failure from liquefaction; therefore, no impact would occur.

Mitigation Measures: No mitigation is required.

iv.) Landslides

Less Than Significant Impact. The proposed Project site and new pipeline route are not located near the known North End or East Flank landslide areas of the FRB Landfill, and therefore would not be affected in any way by these landslides. In addition, the Project site development will involve placing a significant amount of engineered fill into a topographic low spot, with very little cutting of in situ Sespe formation rocks. The new pipeline installation will use trenching and tunneling techniques primarily within road right-of-ways, so it will not create new landslide risks. These construction and installation techniques will seriously limit any existing landslide potential for this location. Thus, no significant impacts from landslides would occur.

Mitigation Measures: No mitigation is required.

b. Would the project result in substantial soil erosion or the loss of topsoil?

Less than Significant Impact. Construction of the Project would include ground-disturbing activities, such as a limited amount of excavation and grading (predominantly of fill materials) in order to build

the Project. The Project involves the development of the approximately 3.52-acres RNG Plant site and the approximately 2.0 mile long SoCalGas pipeline. Because Project construction will involve over one acre, the Project would be subject to and will comply with the requirements of the Construction General Permit under the National Pollutant Discharge Elimination System (NPDES) program administered by the State Water Resources Control Board. The Project site will be paved or landscaped so that little to no exposed soil would remain. The Project would have a less than significant impact related to erosion and loss of topsoil in the construction and operational phases.

Mitigation Measures: No mitigation is required.

c. Is the project 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 onsite or offsite landslides, lateral spreading, subsidence, liquefaction, or collapse?

Less Than Significant Impact. Liquefaction, lateral spreading, and subsidence are not anticipated at the FRB Landfill nor the new pipeline route due to the geologic conditions found in the area (OCWR 2014). This is also true of the new pipeline route since it is in the same geologic conditions. These phenomena are typically observed in areas with deep, soft soils and a high groundwater table, which is not the case for the FRB Landfill. The Project would not be located near the known North End or East Flank landslides at the northern boundary of the FRB Landfill, nor would the Project site be affected in any way by these landslides. No significant impacts would occur.

Mitigation Measures: No mitigation is required.

d. Is the project 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 Impact. The FRB Landfill is underlain by rocks of the Puente, Vaqueros, and Sespe formations, which consist of various types of sandstones, siltstones, and shales (Morton 2004). The new pipeline route is also underlain by these same formations as well as young quaternary alluvium derived from the rocks of these formations and deposited as alluvial fans (so higher energy and coarse sediments). The Project site is specifically underlain by the Sespe formation comprising mainly sandstone. These rocks are thought to have low expansive potential. The rocks of the other formations are also expected to have low expansive potential, as would soils derived from alluvial fan deposits with high sand content and low clay content. Therefore, no significant impacts would occur.

Mitigation Measures: No mitigation is required.

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

Less Than Significant Impact. Sanitary waste will be removed from the Project site via a sanitary disposal system that will route to a septic tank, similar to the adjacent Bowerman Power Plant. As with the currently existing septic system, the Project site soils are expected to adequately support the Project's septic system. No septic system will be associated with the new pipeline. No significant impacts would occur.

Mitigation Measures: No mitigation is required.

f. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant With Mitigation. Impacts to paleontological resources were previously evaluated for the FRB landfill including the Project site (P&D Consultants 2006). The potential for encountering fossils at the Project site with excavation and grading of previously undisturbed surfaces is considered to be high. Although no specific paleontological resource survey has been conducted at the Project site, the underlying Sespe formation rocks are known to contain continental vertebrate fossils in the 20 to 40 million year age range. Most of the site preparation will involve placing engineered fill materials to create a flat surface on which the proposed facilities can be located. A very limited amount of excavation (primarily associated with pipeline installation) will accompany the fill placement. Therefore, mitigation measures are proposed to limit the potential for impacting paleontological resources.

Mitigation Measures.

GEO-1 **Worker Education Program**. The Project proponent shall retain a qualified paleontologist, defined as a paleontologist meeting the Society for Vertebrate Paleontology's Professional Standards (SVP 2010), to carry out all mitigation measures related to paleontological resources. The qualified paleontologist shall conduct the following:

a. Prior to the start of any ground disturbing activities, the qualified paleontologist shall conduct a Paleontological Resources Awareness Training program for all construction personnel working on the project site. A Paleontological Resources Awareness Training Guide approved by the qualified paleontologist shall be provided to all personnel. A copy of the Paleontological Resources Awareness Training Guide shall be submitted to the OCWR. The training guide may be presented in video form.

b. Paleontological Resources Awareness Training may be conducted in conjunction with other awareness training requirements.

c. The training shall include an overview of potential paleontological resources that could be encountered during ground disturbing activities to facilitate worker recognition, avoidance, and subsequent immediate notification to the qualified paleontologist for further evaluation and action, as appropriate; and penalties for unauthorized artifact collecting or intentional disturbance of paleontological resources.

d. The project operator shall ensure all new employees who have not participated in earlier Paleontological Resources Sensitivity Trainings shall meet the provisions specified above.

e. The Paleontological Resources Awareness Training Guides shall be kept available for all personnel to review and be familiar with as necessary.

GEO-2 **Project Monitoring**. A qualified paleontologist or designated monitor shall be onsite initially to spot-check excavations below a depth of one foot below the ground surface in areas of undetermined paleontological potential. If it is determined that sediments consist of older alluvium, then full-time paleontological monitoring shall ensue within that area. If sediments are determined to consist of Holocene Quaternary alluvium, paleontological monitoring shall not be required unless an excavation depth of 15 feet below the ground surface is reached in the area. The use of post-driving or rotary drilling shall not require monitoring.

a. The duration and timing of monitoring shall be determined by the qualified paleontologist in consultation with OCWR and shall be based on a review of geologic maps and grading plans.

b. During the course of monitoring, if the paleontologist can demonstrate based on observations of subsurface conditions that the level of monitoring should be reduced, the paleontologist, in consultation with OCWR, may adjust the level of monitoring to circumstances, as warranted.

c. Paleontological monitoring shall include inspection of exposed rock units during active excavations within sensitive geologic sediments. The qualified paleontologist shall have authority to temporarily divert excavation operations away from exposed fossils to collect associated data and recover the fossil specimens if deemed necessary.

d. Following the completion of construction, the paleontologist shall prepare a report documenting the absence or discovery of fossil resources onsite. If fossils are found, the report shall summarize the results of the inspection program, identify those fossils encountered, recovery and curation efforts, and the methods used in these efforts, as well as describe the fossils collected and their significance. A copy of the report shall be provided to OCWR and to an appropriate repository such as the Natural History Museum of Los Angeles County.

GEO-3 **Inadvertent Discoveries of Paleontological Resources.** If construction staff or others observe previously unidentified paleontological resources during ground disturbing activities, they shall halt work within a 200-foot radius of the find(s), delineate the area of the find with flagging tape or rope (may also include dirt spoils from the find area), and immediately notify a qualified paleontologist. Construction shall halt within the flagged or roped-off area. The paleontologist shall assess the resource as soon as possible and determine appropriate next steps in coordination with OCWR. Such finds shall be formally recorded and evaluated. The resource will be protected from further disturbance or looting pending evaluation.

3.4.8 Greenhouse Gas Emissions

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	Would the project:				
a.	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b.	Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?			X	

A greenhouse gas emissions impact study was conducted for the Project and is provided in Appendix B. The following summarizes the results and conclusions.

Existing Conditions:

GHGs – primarily CO2, methane (CH4), and nitrous oxide (N2O), collectively reported as carbon dioxide equivalents (CO2e) – are directly emitted from stationary source combustion of natural gas in equipment such as water heaters, boilers, process heaters, and furnaces. GHGs are also emitted from mobile sources, such as on-road vehicles and off-road construction equipment, burning fuels such as gasoline, diesel, biodiesel, propane, or natural gas (compressed or liquefied). Indirect GHG emissions result from electric power generated elsewhere (i.e., power plants) used to operate process equipment, lighting, and utilities at a facility. Also, included in GHG quantification is electric power used to pump the water supply (e.g., aqueducts, wells, pipelines) and disposal and decomposition of municipal waste in landfills (CARB 2022a).

Discussion:

a. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant Impact. Using CalEEMod, direct on-site and off-site GHG emissions were estimated for construction and operation of the Project, and indirect off-site GHG emissions were estimated to account for electric power used by the proposed Project, water conveyance, and solid waste disposal. In addition, stationary source emission calculations were performed for the RNG thermal oxidizer and the RNG flare, as well as emergency generator usage. All CO2 derived from LFG is considered biogenic (i.e., are part of the natural biological/physical carbon cycle) and does not result in a net increase in atmospheric CO2. Therefore, for the tail gas streams, only the combustion byproducts of CH4 and N2O (i.e., anthropogenic GHGs) are included in this analysis.

The SCAQMD has officially adopted an industrial facility mass emissions threshold of 10,000 metric tons (MT) CO2e per year.

Table 3-8 shows the incremental GHG emissions and evaluates them against SCAQMD significance thresholds. Operational measures incorporate typical code-required energy and water conservation

features. Off-site traffic impacts are included in these emissions estimates, along with construction emissions amortized over 30 years.

Table 3-8. Greenhouse Gas Emissions Summary and Significance Evaluation

GHGs	aseline (MT/yr)/1	Construction (MT/yr)	Operation (MT/yr) /2	Total2 (MT/yr)	Expected Net Change in Emissions (MT/yr)	Threshold (MT/yr)	Significance
Anthropogenic CO2	0	1,174.70	199.10	238.26	238.26	–	–
CH4	6	0.06	0.74	0.75	-4.80	–	–
N2O	1	0.06	0.06	0.06	-1.03	–	–
R	0	0.4	0.98	0.99	0.99	–	–
Anthropogenic Total (as CO2e)	464	1,194	236.89	276.70	-188	10,000	LTS

Sources: SCAQMD 2008b, Yorke 2024 (Appendix B), CalEEMod version 2022.1.1.26.

/1All CO2 derived from LFG is considered biogenic and does not result in a net increase in atmospheric CO2. All CH4 and N2O emissions are anthropogenic and result in net increases in atmospheric GHG. Thus, the combustion byproducts of CH4 and N2O are included in this analysis.

/2Total CO2e emissions comprises annual operational emissions plus construction emissions amortized over 30 years.

The proposed Project would provide a beneficial use and as shown in Table 3-8, incremental GHG emissions would be below the proposed GHG significance threshold for land use projects. Additionally, the Project will contribute to California Public Utility Commission's Renewable Gas Program to procure RNG made by methane from organic waste from landfills and other sources, reduce the volume of LFG being flared, and help reduce greenhouse gas (GHG) emissions from the FRB Landfill. The RNG plant will have the capacity to process 6,000 standard cubic feet per minute of LFG which is equivalent to avoiding the GHG emissions from 60,196 tons of landfilled waste each year. Thus, impacts would be less than significant.

Mitigation Measures: No mitigation is required.

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

Less Than Significant Impact. The California legislature passed Senate Bill (SB) 375 to connect regional transportation planning to land use decisions made at a local level. SB 375 requires the metropolitan planning organizations to prepare an SCS in their RTPs to achieve the per capita GHG reduction targets. For the SCAG region, the SCS is contained in the 2024-2050 RTP/SCS. The 2024-2050 RTP/SCS focuses the majority of new housing and job growth in high-quality transit areas and other opportunity areas on existing main streets, downtowns, and commercial corridors, resulting in an improved jobs-housing balance and more opportunity for transit-oriented development (SCAG 2024). In addition, SB 743, adopted September 27, 2013, encourages land use and transportation planning decisions and investments that reduce vehicle miles traveled that contribute to GHG emissions, as required by AB 32. The proposed Project would not interfere with SCAG's ability to implement the regional strategies outlined in the 2024-2050 RTP/SCS. As such, impacts would be less than significant, and no mitigation is required

Mitigation Measures: No mitigation is required.

3.4.9 Hazards And Hazardous Materials

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	Would the project:				
a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c.	Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?				X
d.	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e.	Be located within an airport land use plan area or, where such a plan has not been adopted, be within 2 miles of a public airport or public use airport, and result in a safety hazard or excessive noise for people residing or working in the project area?				X
f.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X	
g.	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.			X	

Existing Conditions:

The FRB Landfill is not considered to be a hazardous materials site and accepts only Class III municipal solid wastes. The Project site (RNG Plant site and new SoCalGas pipeline route) is not included on the list of hazardous materials sites compiled pursuant to California Government Code Section 65962.5 (DTSC 2023; SWRCB 2023).

The Project site is not located within 2 miles of a public airport or public use airport. The nearest airport is John Wayne Airport located approximately 9.8 miles to the southwest.

The Project site is located in a State Responsibility Area (SRA) Very High Fire Hazard Severity Zone (OSFM 2023). The OCFA would provide fire services to the proposed Project site. The OCFA provides emergency response to fires and hazardous materials incidents. The nearest fire station is Orange County Fire Station 55 located at 4955 Portola Parkway in the City of Irvine, approximately 2.2 miles northwest of the proposed Project site.

Discussion:

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant Impact. The proposed Project would include the short-term transport, storage, and use of chemical agents, solvents, paints, and other hazardous materials commonly associated with construction activities. Some examples of hazardous materials include fuels, and lubricating fluids such as paints and adhesives, solvents. All transport, storage, and use of hazardous materials or wastes would comply with Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act; and California hazardous waste control law; as well as requirements of the Occupational Safety and Health Administration and OCFA.

The construction of the proposed RNG Plant will require building permits from the County. This permit process ensures that proposed structures meet applicable federal, state, and county codes and regulations. Further, the process will include a review by the OCFA for conformance with fire safety standards. The facility access will be designed to provide sufficient access for fire trucks and other emergency service vehicles. Once completed, the proposed RNG Plant will have a fire protection system in place that will comply with all applicable National Fire Protection Association and County requirements. The Project will be required to obtain approval from OCFA before a building permit can be issued.

The RNG Plant will include the following emergency systems:

- The RNG Plant control system will be designed to operate and maintain the RNG process under normal conditions. If conditions occur outside of the normal operating range, the RNG Plant will shut down and any potentially hazardous process conditions will be combusted in the upset flare.
- The electronic auto-dialing system, currently in place at the adjacent Bowerman Power Plant, will be expanded to include the proposed Project. The system will notify the operator of an abnormal condition during non-business hours and will provide visual and audible warnings to assist operator response.
- In the event of planned maintenance, process upset, or other event, the RNG Plant will be either manually or automatically shut down and LFG will be redirected to landfill flares as necessary.
- The pipeline pressure and flow will be monitored and any change outside of normal operating parameters will shut off the pipeline and shut down the RNG Plant.
- The RNG Plant will have a seismic sensor. In the event of a large earthquake, the RNG Plant equipment will be shut down and pipeline valves will be closed.
- The RNG Plant will have a gas detection system.
- The potential hazards previously identified in the existing Bowerman Power Plant are similar to those anticipated in the proposed RNG Plant. The existing Bowerman Power Plant includes a hazardous management business plan prepared in accordance with county regulations. The plan shall be updated to address new aspects of the RNG Plant equipment and operation. The

current plan addresses business activities, safe handling practices, hazardous material inventory, emergency response, and employee training plans.

- Access and circulation for large vehicles will be provided to the RNG Plant.
- Water supply for firefighting will be supplied by existing on-site FRB Landfill water tanks.

The new SoCalGas pipeline shall be designed to meet the most stringent design, pipeline class, and safety standards (Class 4 requirements) in accordance with Title 49 Code of Federal Regulations (CFR). Emergency shut-off valves, pressure monitoring devices and other control equipment shall be incorporated into the design of the pipeline. The system shall include devices required by 49 CFR 192 and as deemed appropriate by the County. These devices shall be installed on the pipeline at locations and distance intervals specified in federal regulations.

With the implementation of the above-mentioned plans and regulations, potential hazards to the public or the environment through the routine transport, use, or disposal of hazardous materials would be less than significant.

Mitigation Measures: No mitigation is required.

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

Less Than Significant Impact. As discussed in Section 3.4.9.a, above, the design, construction, and operation of the proposed RNG Plant and new SoCalGas pipeline would be subject to federal, state, and local regulation. The proposed RNG Plant would be approximately 4,200 feet (0.8 mile) from the nearest residences. Thus, the risk of accidental release of hazardous materials at the proposed RNG Plant would be less than significant.

A portion of the new SoCalGas pipeline would be approximately 200 feet (0.04 miles) from the nearest residences adjacent to Portola Parkway.

Regulations for gas transmission pipelines establish pipe strength requirements based on population density near the pipeline. Locations along gas pipelines are divided into classes from 1 (rural) to 4 (densely populated) and are based upon the number of buildings or dwellings for human occupancy. Allowable pipe stresses, as a percentage of specified minimum yield strength, decrease as class location increases from Class 1 to Class 4 locations. The proposed pipeline is designed to meet the most stringent class requirement (Class 4) even though the pipeline location allows higher pipe stresses. By designing the pipeline to meet Class 4 standards with a resulting lower allowed pipe stress, the pipeline provides the greatest level of safety for the nearby community.

Given these factors, the potential impacts of the Project due to accidental release of hazardous materials, explosion, or wildfire from foreseeable upset and/or accident conditions (such as pipeline rupture) would be less than significant.

Mitigation Measures: No mitigation is required.

c. Would the project emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

No Impact. There are no schools within 0.25 mile. The closest school to the RNG Plant, Crean Luther High School, is located approximately 1.4 miles to the southwest. The closest school to the new SoCalGas pipeline, Stonegate Elementary School, is located approximately 0.27 mile to the southwest. No impact would occur.

Mitigation Measures: No mitigation is required.

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

No Impact. The proposed Project would be located within the FRB Landfill boundary. The new SoCalGas pipeline will run from the POR within the RNG Plant boundary, down Bee Canyon Access Road to the existing SoCalGas pipeline on the corner of Portola Parkway and Jeffery Road. Neither the FRB Landfill of the new SoCalGas pipeline route are on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

Mitigation Measures: No mitigation is required.

e. For a project located within an airport land use plan area or, where such a plan has not been adopted, be within 2 miles of a public airport or public use airport, and result in a safety hazard or excessive noise for people residing or working in the project area?

No Impact. The Project RNG Plant site and the new SoCalGas pipeline are also not located within 2 miles of a public airport or public use airport. The Project would not result in a safety hazard for people residing or working in the Project Area and no impact would occur.

Mitigation Measures: No mitigation is required.

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. An Emergency Action Plan compatible with the existing Bowerman Power Plant and FRB Landfill Emergency Action Plan will be established for the Project.

The major evacuation routes include major streets that dissect the City of Irvine north/south and east/west, including Portola Parkway (City of Irvine 2020). Traffic control will be needed to temporarily reduce available lanes during construction of the new SoCalGas pipeline and street resurfacing, but full road closures are not anticipated during construction. A traffic control plan will be prepared to accommodate this work area corridor along the new SoCalGas pipeline route. These impacts would be short-term and temporary. With implementation of the traffic control plan, no significant impact would occur.

Mitigation Measures: No mitigation is required.

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

Less Than Significant Impact. The Project RNG Plant site and the new SoCalGas pipeline route and the neighboring open space and park lands are in a high fire hazard severity zone. As discussed in Section 3.4.9.a, above, the design, construction, and operation of the proposed RNG Plant and new SoCalGas pipeline would be subject to federal, state, and local regulation which would greatly minimize the potential for wildfires originating from the RNG Plant or SoCalGas pipeline.

In addition, due to its location in a high fire hazard severity zone, Project implementation would conform to CBC Chapter 7A (CBC 2022; Materials and Construction Methods for Exterior Wildfire Exposure) and California Fire Code Chapter 47 (CFC 2022: Requirements for Wildland-Urban Interface Fire Areas), which would reduce the risk of loss, injury, or death from wildland fires. By implementing these consistency measures and design criteria, and adhering to the applicable requirements of CBC Chapter 7A and California Fire Code Chapter 47, the potential for the Project to expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires would be less than significant.

Mitigation Measures: No mitigation is required.

3.4.10 Hydrology And Water Quality

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

A hydrology and water quality study was conducted for the Project and is provided in Appendix E. The following summarizes the results and conclusions.

Existing Conditions:

The Project site and new SoCal Gas pipeline route are located within the San Diego Creek Watershed, an area of about 112 square miles. This watershed drains portions of the foothills of the Santa Ana Mountains (Loma Ridge) and a large alluvial plain southwest of the mountains that covers significant portions of the cities of Santa Ana, Tustin, and Irvine. San Diego Creek discharges into Upper Newport Bay which connects to the Pacific Ocean through Newport Harbor. Parts of the stream network within this watershed are classified as impaired water bodies, including the Upper Newport Bay, San Diego Creek Reach 1, San Diego Creek Reach 2, Borrego Creek, and Serrano Creek. Only the Upper Newport Bay, San Diego Creek Reach 1, and San Diego Creek Reach 2 water bodies are downstream from the Project site. The RNG Plant phase of the Project site is located within the upper part of the Bee Canyon

Wash watershed. The local drainage area encompassing the Project site covers about 4.42 acres. This includes the distinct areas within this drainage listed below:

- RNG Plant Pad Area (2.3 acres): Runoff will be contained and routed to a facility bioretention basin for water quality control.
- Upslope Disturbed Area (1.34 acres): Runoff will be collected in a perimeter ditch surrounding the pad and routed around the facility.
- Upslope Undisturbed Area (0.33 acres): Runoff will be collected in a perimeter ditch surrounding the pad and routed around the facility.
- Downslope Disturbed Area (0.45 acres): Runoff from this area is downgradient from the RNG Plant Pad and currently drains to the existing conveyance.

The area evaluated for long-term changes due to the facility after construction was only the RNG Plant Pad. The SoCalGas pipeline phase of the Project is located partly in the Bee Canyon watershed and partly within the Hick's Canyon watershed (Geosyntec 2023).

Runoff from the RNG Project site, its larger watershed, and additional flow from the greater landfill area is conveyed downstream about 1,500 feet by a trapezoidal concrete channel to a sedimentation basin within the landfill boundaries (also concrete-lined) that is owned and maintained by OCWR. Discharge from this sedimentation basin empties into a concrete channel and travels downstream approximately 1,100 feet before transitioning to an unlined channel for another 1,700 feet. It then discharges into the Bee Canyon Retarding Basin owned and operated by the Orange County Flood Control District (OCFCD), located on Bee Canyon Wash just north of State Highway 241.

Water quality in this part of Orange County is regulated by a combination of federal, state, and local governance. The federal Clean Water Act (CWA) gives the United States Environmental Protection Agency authority to issue permits for stormwater discharge for construction sites and industrial sites (for operations). Authority to issue these permits has been granted to the state (specifically to the RWQCBs) through a "general permit" issued to the state. The RWQCB, in this case the Santa Ana Region, extends their approval to qualifying permittees who adhere to specific requirements, including the preparation and implementation of a site-specific Stormwater Pollution Prevention Plan (SWPPP) and a project-specific Water Quality Monitoring Plan (WQMP). The latter is required only for a "priority development project", for which the Project qualifies, because it creates 10,000 square feet or more of new impervious surface area.

Control of changes to runoff volume from construction, and eventually due to the changed conditions of the developed site, are also regulated by the RWQCB through permitting of the Municipal Separate Storm Sewer System (MS4) for Orange County and the City of Irvine.

Discussion:

a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less Than Significant Impact. Because of the regulations noted above, the Project will be required to prepare and implement a SWPPP and a WQMP which will be provided by Bowerman Power for the RNG Plant and by SoCalGas for the pipeline connecting to existing gas line infrastructure. These

documents will provide site-specific protections, though best management practices (BMPs), whose implementation will ensure that water quality stressors are controlled or eliminated. In addition, most of the plant equipment and operations will be indoors, and this will cause limited opportunity to introduce water pollutant constituents to either the rainfall-runoff process or the infiltration process. As a result, the proposed Project would produce a less than significant impact on surface or groundwater quality.

Mitigation Measures: No mitigation is required.

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

Less Than Significant Impact. Both the RNG Project site and the new pipeline route are located in small, first-order drainages (Bee Canyon and Hicks Canyon) in the foothills of the Santa Ana Mountains. Neither of these small watersheds contain recognized or significant (i.e. regional) groundwater resources. There will be no change in the amount of impervious surface area along the route of the SoCalGas connecting pipeline. Groundwater is not used in the larger Bee Canyon area or the FRB Landfill, nor is it advisable within a landfill. The loss of approximately 1.38 acres of pervious surface area at this location would have a very minor effect on groundwater recharge in this area of essentially unused groundwater. Therefore, the Project is not expected to have a significant impact on groundwater recharge or impede sustainable groundwater management within the basin.

Mitigation Measures: No mitigation is required.

c. Would the project 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 that would:

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

Less Than Significant Impact. During construction of the RNG Plant, approximately 2.3 acres of land will be disturbed for construction of the pad on which the plant will be located. The disturbance will include clearing and grubbing of native vegetation and placement of approximately 70,000 cubic yards of engineered fill to create the flat, stable surface on which the plant will be built. The construction of the SoCalGas connector pipeline will require excavation of a trench that will be 18 to 24 inches wide, an average of 6 feet deep, and approximately 2.4 miles in length. The right-of-way for pipeline construction activities is 50 feet, most of which is currently paved. Such active ground disturbance creates the potential for erosion and off-site transport of soil materials when it rains. As noted in Section 3.4.10.a, both the RNG plant and the gas pipeline construction will require a distinct, project-specific SWPPP be prepared and implemented to limit this potential. BMPs will be employed to help control on-site erosion and off-site transport of sediment. As a result, the potential for erosion and siltation from either phase of the project will be less than significant.

Mitigation Measures: No mitigation is required.

(ii). Substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site?

Less Than Significant Impact. A significant amount of land will be cleared for construction of the RNG plant (approximately 2.3 acres) and almost all of it will become impermeable surface area. A significant volume of fill (70,000 cubic yards) will be placed on the disturbed areas, and the majority of the site will become a relatively flat surface with a very gentle slope to the west-southwest. An evaluation of the hydrology and hydraulics under current conditions and also during proposed conditions was performed to assess needs for surface water control during construction and afterward during facility operations (Geosyntec 2023). Results of this evaluation determined that some surface water runoff control will be needed to address increases in runoff and the preferred method of control was to employ an on-site bioretention basin. Following recommendations of the evaluation, the Project plans to create a bioretention facility on the RNG plant site with an 1,815 square foot area and a capacity of 9,800 cubic feet. The proposed connector pipeline will be placed within areas currently considered impervious (within paved roadways). Because it is a linear feature, any runoff that occurs during construction will be distributed across a large drainage area and will not cause any noticeable effects on peak flows or flooding. As a result of the deployment of a bioretention facility and moderation of slopes at the RNG plant site, and the limited to no effect on runoff from the pipeline, this Project is expected to have a less than significant impact on surface water runoff and flooding.

Mitigation Measures: No mitigation is required.

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

Less Than Significant Impact. The FRB Landfill currently has multiple sedimentation basins, one of which is directly downstream from the proposed RNG plant location. It is sized for a significant percentage of the landfill operation that currently requires daily earthwork (excavation and placement of fill material). The drainage area within which the RNG plant will be located represents a very small percentage of the larger FRB Landfill drainage. However, the planned use of on-site controls under an SWPPP and the installation of a bioretention basin will limit off-site stormwater drainage and possible pollutants. The limited surface area and linearly distributed disturbances from the SoCalGas connector pipeline will have almost no effect on stormwater drainage outside of the FRB Landfill drainage. In addition, off-site runoff of water and pollutants from pipeline construction will also be limited through the implementation of a separate, project-specific SWPPP. Therefore, the project will have a less than significant impact on surface water runoff, stormwater drainage systems, and contribution of pollutants to surface waters.

Mitigation Measures: No mitigation is required.

(iv). Impede or redirect flood flows?

Less Than Significant Impact. The RNG plant site will include a sizable reconfiguration of the topography within the very small portion of the watershed in which it is located. This will include a serious reduction in slope for much of the site and the installation of a new stormwater drainage system which will discharge into a bioretention basin. The basin will moderate flood flows and leave downstream peak discharges at or below current conditions. There is no defined floodplain at the RNG plant site, so Project implementation will not impede or redirect flood flows on a floodplain, nor

create a flooding hazard where none currently exists. There may be minor, temporary changes in surface runoff direction along the SoCalGas connector pipeline during construction, but it will not affect any stormwater conveyance channels. Most of the pipeline route is within the limits of existing roadways, where open-trenching installation procedures will be used. At some locations, particularly at roadway intersections, directional drilling techniques will be employed, thus avoiding any potential disruption to open channels. Once completed, this pipeline will be entirely underground, and will not impact surface water or flood flows. Thus, Project construction and facility use are expected to have a less than significant impact on impeding or redirecting flood flows.

Mitigation Measures: No mitigation is required.

d. Would the project, in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

No Impact. Neither the RNG plant site nor the connector pipeline is near the ocean or any sizeable freshwater body (in either a lateral or vertical direction). In addition, neither is located within a tsunami or seiche risk zone. Therefore, there is no potential that the Project area could be affected by a tsunami or a seiche. As a result, the Project is expected to have no impact on the potential for releasing pollutants due to the occurrence of a tsunami or seiche.

Mitigation Measures: No mitigation is required.

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less Than Significant Impact. Both phases of the Project (the RNG plant and the connector pipeline) will follow the requirements of a location-specific SWPPP. This will limit the potential for contributing pollutants to a watershed which already contains impaired water bodies. In doing so, the Project will follow the requirements in place through the Santa Ana RWQCB for controlling water quality (SWRCB 2018 and 2022). Neither the RNG plant site (within the Bee Canyon Wash watershed) nor the SoCalGas pipeline connector (within the Hicks Canyon Wash watershed) are located within a significant (i.e. regional) aquifer, so they are not governed by any groundwater management plans. Therefore, the Project will have a less than significant impact on existing water quality control plans or groundwater management plans.

Mitigation Measures: No mitigation is required.

3.4.11 Land Use and Planning

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	Would the project:				
a.	Physically divide an established community?			X	
b.	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?				X

Existing Conditions:

The Project is located within the FRB Landfill boundaries, except for the western end of the new SoCalGas pipeline connecting to the existing SoCalGas pipeline which is located in the City of Irvine. The Orange County General Plan designation for the FRB Landfill site is 4LS (Public Facilities; Landfill Site) and the zoning designation is A1 General Agriculture. The City of Irvine General Plan designation for the pipeline within City of Irvine is Recreation and Low Density Residential and zoning is not defined for the roadway in which the pipeline will be located.

Discussion:

a. Would the project physically divide an established community?

Less Than Significant Impact. The Project does not involve changes to the FRB Landfill boundary. For construction of the SoCalGas pipeline, traffic control will be needed to temporarily reduce available lanes during the construction within Bee Canyon Access Road, Portola Parkway, and the intersection of Portola Parkway and Jeffery Road. However, full road closures are not anticipated. In addition, a traffic control plan will be prepared to accommodate this work area width along the pipeline route. These impacts will be short term and temporary and will have a less than significant impact to utilization of roadways. Therefore, the proposed Project will not physically divide an established community and no impact will occur.

Mitigation Measures: No mitigation is required.

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

No Impact. The Project does not involve changes to the FRB Landfill land use designation or zoning. Because the property is owned by the County of Orange, the Project is exempt from the provisions of the Orange County Zoning Code, pursuant to Orange County Codified Ordinance, Ordinance No. 99-02, Section 2, Section 7-9-20(i). The Project does not involve changes to the City of Irvine land use designation or zoning. In addition, the proposed Project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project; therefore, no impacts would occur.

Mitigation Measures: No mitigation is required.

3.4.12 Mineral Resources

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

Existing Conditions:

Mineral Resource Zones are commercially viable mineral or aggregate deposits, such as sand, gravel, and other construction aggregate. The mineral resources in Orange County consist of deposits of regionally significant sources of aggregate identified by the California Department of Conservation, Divisions of Mines and Geology (County of Orange 2012). Such significant sand and gravel resources in the Orange County region are located in portions of the Santa Ana River, Santiago Creek, San Juan Creek, Arroyo Trabuco, and other areas, not within or near the FRB Landfill. Orange County's petroleum resources are in the form of oil and natural gas deposits. The primary petroleum resource areas of the County are in Huntington Beach**,** Newport Beach, Seal Beach, and the Brea/La Habra foothill regions. The Project site (RNG Plant site and new SoCalGas pipeline route) is not located in any of these areas.

Discussion:

a. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. No mineral recovery activities currently occur in the Project vicinity, and the Project site is not underlain by any known mineral resources of value to the region and residents of the State. Thus, no impacts would occur.

Mitigation Measures: No mitigation is required.

b. Would the project 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. As noted above in the existing conditions discussion, the Project site is not located within a Mineral Resource Zone or an area of oil and gas resources. Thus, no impacts would occur.

Mitigation Measures: No mitigation is required.

3.4.13 Noise

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	Would the project result in:				
a.	Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in a local general plan or noise ordinance, or applicable standards of other agencies?			X	
b.	Generation of excessive groundborne vibration or groundborne noise levels?			X	
c.	For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X

A noise impact study was conducted for the Project and is provided in Appendix F. The following summarizes the results and conclusions.

Existing Environment:

The proposed Project is bordered by the Bowerman Power Plant and the FRB Flare Station to the south, the OCWR FRB Landfill operations buildings to the west and north, and the FRB Landfill to the east. The nearest sensitive receptor area is the Portola Springs residential community of single-family homes located approximately 4,200 feet (0.8 mile) south of the facility and 230 feet south of the SoCalGas pipeline, in the City of Irvine.

Sharp terrain characterizes the general area around the proposed Project site. Salient hills stand between the Project site and the residential development, rising more than 100 feet above the Project site and more than 400 feet above the residential area. This elevated terrain provides a substantial natural noise barrier between the Project site and the residences. Furthermore, the northern part of the residential development is bounded by two major highways, State Routes 133 and 241, which are closer and less shielded major noise sources compared to the Project site.

Sensitive Receptors

Sensitive receptors that may be affected by the proposed RNG Plant are residences located approximately 0.8 mile south of the site, on the opposite side of SR 241. Sensitive receptors that may be affected by the construction of the proposed pipeline are residences approximately 230 feet south of the pipeline route. Other sensitive land uses that are located at greater distances than these receptors will experience lower noise levels than those presented in this report due to the additional attenuation from distance, topography, and the shielding of intervening structures. Attenuation distance is measured in a straight line from the project boundary for each phase to the nearest sensitive receptor location.

An existing noise survey was performed that indicated that the ambient noise levels at the nearest sensitive receptors (i.e., residences south of the Project site) range between 42 and 48 A-weighted decibels (dBA) during daytime hours and between 38 and 41 dBA at nighttime (see Appendix F).

Discussion:

Construction Noise Analysis Methodology

The screening-level noise analysis for Project construction was completed based on methodology developed by the U.S. Department of Transportation Federal Highway Administration (DOT FHWA) at the John A. Volpe National Transportation Systems Center, and other technical references consistent with California Emissions Estimator Model® (CalEEMod) outputs (equipment utilization). The DOT FHWA methodology uses actual noise measurement data collected during the Boston "Big Dig" project (1991-2006) as reference levels for a wide variety of construction equipment in common use, such as on the proposed Project.

The DOT FHWA noise model provides relatively conservative predictions because it does not account for site-specific geometry, dimensions of nearby structures, and local environmental conditions that can affect sound transmission, reflection, and attenuation. As a result, actual measured sound levels at receptors may vary somewhat from predictions, typically lower. Additionally, the impacts of noise upon receptors (persons) are subjective because of differences in individual sensitivities and perceptions.

Noise impacts are evaluated against community noise standards contained in the City or County General Plan, Municipal Code, or other state or federal agency as applicable to the vicinity of the project site.

Screening-level project-generated noise is evaluated in relation to established thresholds of significance. Additionally, the same methods are used to determine noise impacts on the nearest sensitive receptor. There is no numerical standard in the Municipal Code for construction activities; however, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment provides an 8-hour construction noise level threshold of 80 dBA equivalent noise level (L_{eq}) during the daytime at residential (noise-sensitive) uses and 85 dBA during the daytime at commercial uses. Therefore, noise impacts for the proposed Project are evaluated against the FTA noise standards.

During construction activities, the Project would generate noise and vibration due to operation of off-road equipment, portable equipment, and vehicles at or near the Project site. No strong sources of vibrations (e.g., hard rock-breaking, large pile-driving) are planned to be used during the construction of the RNG Plant. A mounted impact hammer (hoe ram), which is a percussive source, may be occasionally used during the pipeline construction, when encountering rocks during trenching. FTA has published standard vibration velocities for construction equipment operations. Generally, a peak particle velocity (PPV) vibration threshold of approximately 0.3 inch/second is sufficient to avoid physical damage to engineered structures (FTA 2018). The types of construction vibration impacts include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Table 3-9 presents average source levels in terms of velocity for different types of construction equipment.

Table 3-9. FTA Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 feet (in/sec)	
Pile Driver (Impact)	Upper Range	1.518
	Typical	0.644
Pile Driver (Sonic)	Upper Range	0.734
	Typical	0.170
Clam Shovel Drop (slurry wall)		0.202
Hydromill (slurry wall)	In Soil	0.008
	In Rock	0.017
Vibratory Roller		0.210
Hoe Ram		0.089
Large Bulldozer		0.089
Caisson Drilling		0.089
Loaded Trucks		0.076
Jackhammer		0.035
Small Bulldozer		0.003

Source: FTA (2018)

Traffic Noise

No significant increase in traffic is expected due to this relatively small project. Since the receptors are near the two highways, the incremental effect of Project operation would not be quantifiable against existing traffic noise (background) in the Project vicinity (i.e., less than significant impact). Also, since no airport is closer than 2 miles from the Project site, evaluation of aircraft noise upon the Project is not required.

Traffic disruptions caused by pipeline construction would include the effects of temporary reduced speed limits for safety in work zones, such as lane reductions. Since vehicle speeds would be reduced, traffic noise would also be reduced due to: 1) less wind noise due to reduced velocity; 2) less tire noise due to lower wheel revolutions; and 3) less engine mechanical noise due to lower running speeds. Therefore, traffic disruptions would be expected to result in decreased traffic noise.

Temporary construction noise would be limited to the City of Irvine's allowable daytime construction hours (i.e., between 7:00 a.m. and 7:00 p.m. Mondays through Fridays, and 9:00 a.m. and 6:00 p.m. on Saturdays) and would permanently cease upon completion of construction. Most construction noise would occur during the site preparation, grading, building construction, trenching, and paving phases when heavy equipment would be operating.

During each of the six construction phases there would be a different mix of equipment operating, and cumulative noise levels would vary based on the amount of equipment in operation and the location of each activity at the Project site. In general, use of off-road equipment and portable equipment would generate noise due to engine mechanicals, engine exhaust, driveline mechanicals, shaft-driven devices and accessories, hydraulics operation, ground friction and displacement, and gravity drops (dumping, unloading).

Based on the information presented in Table 3-10, nearest off-site structures over 4,200 feet away from the RNG Plant would not be exposed to a PPV of greater than 0.3 inch/second during construction, which is the threshold at which physical damage to engineered buildings may occur. Since no intense percussive actions (e.g., hard rock-breaking, large pile-driving) are planned to occur during the construction of the RNG Plant, no strong groundborne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants (the FRB Landfill administration office building is over 328 feet away from the construction site). A mounted impact hammer (hoe ram), which is a percussive source, may be occasionally used during the pipeline construction, when encountering rocks during trenching. The PPV at nearest receptors approximately 230 feet from the new SoCalGas pipeline, would be about 0.003 inch/second, which is well below the FTA threshold of 0.3 inch/second.

Construction activities typically generate maximum noise levels in the range of 85 to 90 dBA at a distance of 50 feet. Types of equipment (FHWA 2006) to be used during the Project and noise-emitting characteristics (i.e., usage factors, reference dBA, and percussive source) are shown in Table 3-10 consistent with CalEEMod outputs.

The Project is expected to require up to approximately one year of planned work activities (i.e., from mobilization to substantial completion) comprising six construction phases:

1. Site preparation;
2. Grading;
3. Building construction;
4. Paving;
5. Architectural coating; and
6. Trenching and pipeline construction.

Deviations from this schedule would not affect the noise analysis because noise does not persist or accumulate in the environment.

Table 3-10. FHWA Noise Reference Levels and Usage Factors

CalEEMod Construction Detail			FHWA Equipment Type	Ref.	Usage Factor	Ref. Level	Percussive Source
Phase Name	Equipment Description	Qty.			Percent	dBA	Yes/No
Site Preparation (1)	Graders	1	Grader	1	40%	85	No
	Rubber Tired Dozers	1	Dozer (crawler tractor)	1	40%	85	No
	Tractors/Loaders/Backhoes	1	Backhoe (with loader)	1	40%	80	No
Grading (2)	Rubber Tired Dozers	2	Dozer (crawler tractor)	1	40%	85	No
	Tractors/Loaders/Backhoes	2	Backhoe (with loader)	1	40%	80	No
	Sweepers/Scrubbers	1	Vacuum Street Sweeper	1	10%	80	No
	Cement and Mortar Mixers	1	Drum Mixer	1	50%	80	No
	Dumpers/Tenders	10	Dump Truck	1	40%	84	No
	Off-Highway Trucks	1	Water Truck	1	40%	84	No
Building Construction (3)	Cranes	2	Crane	1	16%	85	No
	Forklifts	1	Forklift	1	40%	80	No
	Tractors/Loaders/Backhoes	1	Backhoe (with loader)	1	40%	80	No

CalEEMod Construction Detail			FHWA Equipment Type	Ref.	Usage Factor	Ref. Level	Percussive Source
Phase Name	Equipment Description	Qty.			Percent	dBA	Yes/No
	Aerial Lifts	1	Man Lift	1	20%	85	No
	Off-Highway Trucks	1	Water Truck	1	40%	84	No
Paving (4)	Cement and Mortar Mixers	1	Drum Mixer	1	50%	80	No
	Pavers	1	Paver (asphalt)	1	50%	85	No
	Paving Equipment	1	Paver (asphalt)	1	50%	85	No
	Rollers	1	Roller	1	20%	85	No
	Tractors/Loaders/Backhoes	1	Backhoe (with loader)	1	40%	80	No
Architectural Coating (5)	Air Compressors	1	Compressor (air)	1	40%	80	No
Trenching and Pipeline Construction (6)	Bore/Drill rigs	1	Drill Rig Horizontal (boring)	1	100%	85	No
	Excavators	1	Excavator (hydraulic)	1	40%	85	No
	Rubber Tired Dozers	1	Tractor (rubber tire)	1	40%	84	No
	Tractors/Loaders/Backhoes	1	Dozer (crawler tractor)	1	40%	85	No
	Cranes	1	Crane	1	16%	85	No
	Graders	1	Grader	1	40%	85	No
	Other General Industrial Equipment	1	Mounted Impact Hammer (hoe ram)	1	20%	90	Yes
	Air Compressors	1	Compressor (air)	1	40%	80	No
	Other Construction Equipment	1	Crane	1	16%	85	No

Sources: CalEEMod version 2022.1.1.19, FHWA 2006

Table 3-11 shows a comparison of FHWA screening-level estimated daytime exterior noise impacts for peak RNG Plant construction activities at the nearest receptors with respect to the FTA thresholds. If the thresholds are not exceeded, then a project should be considered acceptable, i.e., less than significant.

Table 3-11. Estimated Peak Activity Construction Noise Impacts at the Nearest Sensitive Receptor

Construction Phases	Normal Acceptance Criteria			
	Modeled Noise Level (L_{eq} dBA)/1	CalEEMod Duration (days)	Significance Threshold (CNEL dBA)/2	Exceeds Threshold? (Yes/No)
Background	48.1	-	-	No
Site Preparation	48.3	11	80	No
Grading	48.9	49	80	No
Building Construction	48.3	185	80	No
Paving	48.5	11	80	No
Architectural Coating	48.1	16	80	No
Pipeline Construction	77.2	240	80	No

Sources: CalEEMod version 2022.1.1.19, FHWA 2006, FTA 2018, Broch 1971, Plog 1988.
Notes:
CNEL = Community Noise Equivalent Level
/1 Includes existing ambient noise level (cumulative impacts)
/2 FTA Noise Limits for Construction

As shown in Table 3-11, the aggregated average construction noise would be well below the 80 dBA FTA noise level threshold at nearby receptors. Although the estimated noise levels are below the threshold, the Project is proposing to install a noise monitoring instrument during the SoCalGas pipeline construction activities, as a BMP, to continuously monitor the construction noise levels to ensure that they remain below the 80 dBA threshold. Noise barriers and mufflers may also be installed as additional BMPs.

Operational Noise Analysis Methodology

The potential noise impacts on the community are associated with the proposed equipment operating on the Project site (see Figure 2-10).

The Project impact evaluation was performed using SoundPlan Essential 5.1, an environmental noise propagation computer program that was developed to assist with noise propagation calculations for major noise sources and projects. The program calculates the sound pressure level at a location utilizing the sound emission properties of the source(s) and environmental propagation factors (sound spreading due to distance, ground effects, barriers, topography, as well as atmospheric attenuation). The program also includes a number of standardized methodologies that can be utilized to quantify the acoustic effect of these environmental factors. The specific standard employed by this program is that described in the International Organization for Standardization (ISO) Standard 9613, "Acoustics – Attenuation of sound during propagation outdoors." The modeled ambient temperature was 10 degrees Celsius (50 degrees Fahrenheit), and the assumed relative humidity was 70 percent. The ground absorption value utilized in the model was set to "0" for hard for the Project site and existing facility to the south and "0.5" for partially hard and soft ground for the vegetative area (i.e., hills) to the south. The backup generator will be housed inside a sound-attenuated and weatherproof enclosure. Therefore, an insertion loss of 15 dB was applied to the backup generator since it will be located inside a steel weatherproof enclosure with silencing properties.

The main noise source will be noise from motor-driven equipment, such as gas compressors. The expected "worst-case" scenario, with all equipment operating simultaneously, was assumed during both daytime and nighttime hours. Noise sources were entered in the modeling system as octave band sound power levels based on the sound pressure of the equipment provided by vendors. Sound pressures were then converted to sound powers in SoundPlan. Table 3-12 lists the sound power levels of the proposed equipment.

To assess the potential for operational noise impacts, three sensitive receptor (receiver) locations were used as shown on Figure 3.4-6. These were the same locations at which the ambient noise measurements were taken. The locations of these receptors are denoted by yellow dots in Figure 3.4-6. Note: Receiver 1 is not a sensitive receptor. Receiver 1 was used to predict the noise levels at the proposed site.

Figure 3.4-6 shows the future noise level map at the sensitive receptor areas and the property boundaries, including the 55 dBA daytime and 50 dBA nighttime noise limit lines. Figures 3.4-7 and 3.4-8 present noise level contours for all hours (daytime, evening, and nighttime) and CNEL, respectively, at the sensitive receptor areas and the property boundaries. Predicted operational noise levels, exclusive of ambient background, are anticipated to range between 25.5-40.4 dBA during the daytime, evening, and nighttime

hours at the nearest sensitive receivers without any noise mitigation. Table 3-13 shows the results of the noise level predictions. As discussed above, both the County of Orange and the City of Irvine prohibit noise levels greater than 50 dBA at nighttime and 55 dBA during daytime hours at residential receptors. As shown in Table 3-13, total operational noise levels at the nearest sensitive receptors will not exceed the 50 dBA and 55 dBA limits at nighttime and daytime hours, respectively. As illustrated in Figure 3-6, operational noise that could exceed these limits would be confined to the RNG Plant site and immediate vicinity of the landfill. Furthermore, the Federal Interagency Committee on Noise guidance (1992) provides an established criteria to assess the impacts of substantial temporary or permanent increases in ambient noise levels. Based on the Federal Interagency Committee on Noise criteria, if ambient noise levels are less than 60 dBA L_{eq}, a change in a noise level of 5 dBA or greater is considered significant. The operation of the proposed equipment may raise the ambient noise level for the most impacted sensitive receptor by up to 4.2 dBA. Thus, the operation of the proposed RNG Plant is not expected to cause any significant impact during daytime, evening, or nighttime hours. Interior noise levels will be maintained at current levels at nearby receptors.

a. Would the project result in 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?

Less Than Significant Impact. As shown in the above analysis, temporary construction noise would be limited to the City of Irvine's allowable daytime construction hours and would permanently cease upon completion of construction. The aggregated average RNG Plant and SoCalGas pipeline construction noise is not expected to exceed 80 dBA at nearby receptors, which is below the noise limit set by the FTA. Therefore, temporary impacts on ambient noise levels in excess of applicable standards during construction would be less than significant. The noise from the proposed RNG Plant operation is not expected to raise the ambient noise levels for the nearest sensitive receptors as they are approximately 0.8 mile from the Project site and are shielded by the hills that are located between the residential area and the proposed facility. The interior noise levels will be maintained at current noise levels at nearby receptors. Additionally, total operational noise levels at the nearest sensitive receptors will not exceed the 50 dBA and 55 dBA limits at nighttime and daytime hours, respectively. Therefore, operational noise impacts will be less than significant.

Mitigation Measures: No mitigation is required.

b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact. Construction plans for the proposed RNG Plant or the new SoCalGas pipeline do not include intense percussive actions (e.g., hard rock-breaking, large pile-driving). A mounted impact hammer (hoe ram), which is a percussive source, may be occasionally used during the pipeline construction, when encountering rocks during trenching. The PPV at nearest receptors would be approximately 0.003 inch/second, which is well below the FTA threshold of 0.3 inch/second. Therefore, no strong groundborne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants, and impacts would be less than significant.

Mitigation Measures: No mitigation is required.

Table 3-12. Sound Power Levels in Octave Band Format for Proposed Equipment (dBA)

Source name	Sum, Sound Power (dBA)	Octave Band Centre Frequency (Hz), Sound Power Levels (dBA)											
		63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1,000Hz
Back Up Generator	107.2	75.2	78.9	82.3	85.3	88.0	90.5	92.8	94.8	96.6	98.2	99.5	100.6	101.4
CO2 Removal Vacuum Compressor	92.2	60.2	63.9	67.3	70.3	73.0	75.5	77.8	79.8	81.6	83.2	84.5	85.6	86.4
CO2 Removal Vacuum Oil Cooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
Feed Compressor	107.7	75.7	79.4	82.8	85.8	88.5	91.0	93.3	95.3	97.1	98.7	100.0	101.1	101.9
Feed Compressors Aftercooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
Feed Compressors Oil Cooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
Flare Combustion Blower	107.2	75.2	78.9	82.3	85.3	88.0	90.5	92.8	94.8	96.6	98.2	99.5	100.6	101.4
Glycol Circulation Pump	92.2	60.2	63.9	67.3	70.3	73.0	75.5	77.8	79.8	81.6	83.2	84.5	85.6	86.4
Instrument Air Compressor	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
N2 Removal Recycle Compressor	107.7	75.7	79.4	82.8	85.8	88.5	91.0	93.3	95.3	97.1	98.7	100.0	101.1	101.9
N2 Removal Vacuum Compressor	107.7	75.7	79.4	82.8	85.8	88.5	91.0	93.3	95.3	97.1	98.7	100.0	101.1	101.9
N2 Removal Recycle Compressors Aftercooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
N2 Removal Recycle Compressors Oil Cooler	97.2	65.2	68.9	72.3	75.3	78.0	80.5	82.8	84.8	86.6	88.2	89.5	90.6	91.4

Source: Yorke 2024 Appendix F, SoundPlan Essential 5.1

dBA = A-weighted decibels, Hz = Hertz

Since no spectral data was available, only the sound power levels, the spectra for only the lower frequency ranges (four octaves) were estimated. The higher frequencies would not carry as far as the lower frequencies, therefore they are not expected to impact the nearest sensitive receptors. An insertion loss of 15 dB was applied to the backup generator since it will be placed inside a weatherproof enclosure.

Table 3-13. Receiver Predicted Noise Level Impacts (dBA)

Receiver No.	Receiver Name	Floor	Ambient Noise Levels (dBA)/1				Predicted Noise Levels (dBA)		Combined Noise Levels (dBA)			Difference between Ambient and Combined (dBA)		
			Daytime	Evening	Nighttime	CNEL	Daytime Evening Nighttime	CNEL	Daytime	Evening	Nighttime	Daytime	Evening	Nighttime
1	Project Site	GF	63.1	63.1	62.8	69.5	80.8	80.8/2	80.9	80.9	80.9	17.8	17.8	18.1
2	SL#2	GF	42.0	42.0	38.2	45.9	37.1	43.8	43.2	43.2	40.7	1.2	1.2	2.5
2	SL#2	1.Fl	42.0	42.0	38.2	45.9	40.4	47.1	44.3	44.3	42.4	2.3	2.3	4.2
3	SL#3	GF	47.3	47.3	38.9	48.9	29.3	36.0	47.4	47.4	39.3	0.1	0.1	0.5
3	SL#3	1.Fl	47.3	47.3	38.9	48.9	34.8	41.4	47.6	47.6	40.3	0.2	0.2	1.4
4	SL#4	GF	48.1	48.1	41.2	50.3	25.5	32.2	48.1	48.1	41.3	0.0	0.0	0.1
4	SL#4	1.Fl	48.1	48.1	41.2	50.3	26.5	33.2	48.1	48.1	41.3	0.0	0.0	0.1

dBA = A-weighted decibels

/1 Ambient noise levels are based on the noise measurements taken by Yorke on June 20, 2023, at daytime and nighttime hours. In order to be conservative, evening noise levels are assumed to be the same as daytime noise levels.

/2 For exposure determination purposes, CNEL at the project site is assumed to be the same as the daytime predicted noise levels since no operators are anticipated to be onsite outside of normal business hours (i.e., Penalties of 5 dB and 10 dB for evening and nighttime hours, respectively, are not applicable).

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 2 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. There is no public or private use airport within 2 miles of the Project RNG Plant or the new SoCalGas pipeline; therefore, no impact would be expected.

Mitigation Measures: No mitigation is required.

3.4.14 Population and Housing

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	Would the project:				
a.	Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?				X
b.	Displace a substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere?				X

Existing Conditions:

The proposed Project is in unincorporated Orange County within the sphere of influence of the City of Irvine, except for a small portion of the new SoCalGas pipeline, which will be located within the City of Irvine.

Discussion:

a. Would the project induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?

No Impact. The proposed Project RNG Plant will be developed within the FRB Landfill boundaries and adjacent to the Bowerman Power Plant. The new SoCalGas pipeline will run from the POR within the RNG Plant boundary to the existing SoCalGas pipeline on the corner of Portola Parkway and Jeffery Road. The proposed Project would not involve the construction of any homes, businesses, or other uses that would encourage or result in direct population growth or new infrastructure that would induce indirect population growth. Further, operation of the RNG Plant would be conducted by 10 employees, and therefore, would not significantly increase the population in the Orange County area. Therefore, no impacts would occur.

Mitigation Measures: No mitigation is required.

b. Would the project displace substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact. Construction of the Project would not require the removal or obstruction of existing housing and thus would not require the displacement of people or the construction of replacement housing elsewhere. Therefore, no impacts would occur.

Mitigation Measures: No mitigation is required.

3.4.15 Public Services

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	Would the project:				
a.	Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a 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 following public services:				
	i.) Fire protection?			X	
	ii.) Police protection?			X	
	iii.) Schools?				X
	iv.) Parks?				X
	v.) Other public facilities?				X

Existing Conditions:

Fire

The Project site (RNG Plant and new SoCalGas pipeline) is located in an SRA Very High Fire Hazard Severity Zone (OSFM 2023). The OCFA would provide fire services to the proposed Project site. The OCFA is a regional fire agency that provides services for 23 cities in Orange County, including all of the unincorporated areas of the County (OCFA 2023). Within its service area, the OCFA protects approximately 2 million residents. In order to support this service area, the OCFA has a total of 78 fire stations located throughout the County (OCFA 2023). The nearest fire station is Orange County Fire Station 55 located at 4955 Portola Parkway in the City of Irvine, approximately 2.2 miles northwest of the proposed Project site.

Police

The Orange County Sheriff's Department (OCSD) would project police services to the proposed Project site. The OCSD has approximately 4,000 sworn officers and staff that are divided into six organizational commands comprising a total of 23 divisions (OCSD 2023). Services provided by OCSD include land, air, and sea-based patrol, custody operations, investigative services, emergency management, and more (OCSD 2023). The nearest OCSD is the Lake Forest Division located at 20202 Windrow Drive in the city of Lake Forest, approximately 4.5 miles southeast of the proposed Project site.

Schools

The Irvine Unified School District (IUSD) provides education services to the area in which the proposed Project is located. The IUSD comprises one early childhood learning center, 24 elementary schools, 5 K-8 schools, 6 middle schools, 5 high schools, one alternative high school, and 2 virtual academies, servicing more than 36,000 students (IUSD 2023). Since its inception in 1972, IUSD has become

recognized nationally for academic, arts, and athletic programs (IUSD 2023). The nearest school in the IUSD is Loma Ridge Elementary School located at 500 Tomato Springs in the City of Irvine, approximately 1.4 miles southwest of the Project site.

Parks

Orange County Parks (OC Parks) provides recreational services to Orange County. The nearest OC Regional Park is the Irvine Ranch Open Space in the unincorporated area of Silverado, located approximately 1.10 miles north of the proposed Project site.

The nearest City of Irvine Parks and Facilities recreational resource is the Jeffery Open Space Trail (JOST), which ends/begins at the southwest corner of Jeffery Road and Portola Parkway. The new SoCalGas connecting pipeline from the proposed Project will join to the SoCalGas pipeline system at the southeast corner of this roadway intersection.

For more information on OC Parks and the City of Irvine Parks and Facilities, please see Section 3.4.16.

Discussion:

a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a 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

Less Than Significant Impact. The RNG Plant will include the emergency systems described in Section 3.4.9.

On-site instrumentation will monitor the status of the equipment and the RNG output. Off-site computers will simultaneously monitor the facility functions in real time. Facility operators will be at the site during normal business hours. An alarm and shutdown monitoring system will notify operators by telephone in the event a malfunction occurs. Access and circulation for large vehicles will be provided to the RNG Plant. Water supply for firefighting would be supplied by existing on-site FRB Landfill water tanks. Therefore, no significant impacts to fire protection services or facilities are expected.

Mitigation Measures: No mitigation is required.

ii.) Police Protection

Less Than Significant Impact. The access gate to the FRB Landfill is locked after operating hours and FRB Landfill security patrols the landfill preventing unauthorized access. The RNG Plant site would be fenced and equipped with security lighting and an alarm system. The addition of the RNG Plant is not expected to create additional demand for police protection services over existing conditions. Therefore, no significant impacts to police protection services or facilities are expected.

Mitigation Measures: No mitigation is required.

iii.) Schools

No Impact. Implementation of the proposed Project would not result in the need for the construction of additional school facilities, as the Project would not result in an increase in population nor would it result in a removal of a school, a reduction of school capacity, or displacement of students from existing schools. Therefore, no impacts to school services or facilities are expected.

Mitigation Measures: No mitigation is required.

iv.) Parks

No Impact. Implementation of the proposed Project would not result in the need for the construction of additional park facilities, as the Project would not result in an increase in population, nor would it result in a removal of a park. The development of the new SoCalGas pipeline system at the southeast corner Jeffery Road and Portola Parkway will not involve or impact the JOST. Therefore, no impacts to parks are expected.

Mitigation Measures: No mitigation is required.

v.) Other Public Facilities

No Impact. The proposed Project would not alter any of the government facilities in the area or produce a need for additional or new government services; therefore, no impacts to other public facilities are expected.

Mitigation Measures: No mitigation is required.

3.4.16 Recreation

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	Would the project:				
a.	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b.	Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				X

Existing Conditions:

OC Parks provides recreation services to Orange County. A total of 24 parks and trails comprising 60,000 acres of open space and shoreline make up OC Parks. OC Parks includes regional, wilderness, and historical facilities, along with coastal areas (OC Parks 2023a). Each year, OC Parks sees over a million visitors to its 24 parks and trails (OC Parks 2023a). As mentioned in Section 3.4.15, Irvine Ranch Open Space is the nearest park to the proposed Project site. The Irvine Ranch Open Space includes 3.3 miles of multi-use trails for hiking, biking, and equestrian riding and comprises 25,000 acres of open space (OC Parks 2023b). Features also include docent-led guided tours for small walking groups. The Irvine Ranch Open Space has been determined as a State and National Natural Landmark (OC Parks 2023b).

The City of Irvine Parks and Facilities provides recreational services to the pipeline component of the proposed Project. The City of Irvine contains 22 community parks and 40 neighborhood parks, as well as additional "special facilities" (City of Irvine 2023a). The JOST and Picnic Area is the closest recreation facility in the City of Irvine to the proposed Project. The JOST is a multi-use urban trail that spans 3.5 miles throughout the City of Irvine (City of Irvine 2023b).

Discussion:

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

No Impact. The Project would bring in workers from the surrounding communities. During the peak of construction, 35 temporary employees would be on site. The maximum number of employees during the operation would be 10. Since it is anticipated that temporary construction workers and permanent operational staff would be commuting from the surrounding communities, the current neighborhood and regional parks would not see a significant increase in use that would cause the deterioration of the recreational facilities. Should any employees relocate to Irvine, it would not be a significant increase in use of these facilities.

Mitigation Measures: No mitigation is required.

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

No Impact. The proposed Project is an RNG Plant and new SoCalGas pipeline. Project components would not interfere with any recreational facilities, nor would they create a need for the expansion of any existing recreational facilities. Therefore, the Project would not have impacts on recreational facilities that may have an adverse physical effect on the environment.

Mitigation Measures: No mitigation is required.

3.4.17 Transportation

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

Existing Conditions:

Regional access to the Project site (RNG Plant and new SoCalGas pipeline) is provided by State Routes 55, 133, and 241; Interstates 5 and 405; Sand Canyon Avenue; Portola Parkway; and Bee Canyon Access Road. Only a subset of these routes would be needed for any given trip to access the Project site from various parts of the Orange County, or other adjacent counties.

Discussion:

e. Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle lanes and pedestrian facilities?

Less Than Significant Impact. The proposed Project would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle lanes, and pedestrian facilities.

The proposed Project will result in a short-term increase in traffic associated with construction of the Project that is expected to occur over a span of 2 years, with the majority of the emitting construction phases overlapping during a 1-year period. This traffic would include an estimated maximum of 123 trips per day during construction for worker access to the Project RNG Plant site. In addition, material delivery trips would also occur. As Project construction traffic would be short term and temporary, impacts are expected to be less than significant.

Construction of the new SoCalGas pipeline will take place in the along Bee Canyon Access Road and Portola Parkway. During construction, traffic control will be needed to temporarily reduce available lanes during the construction within Bee Canyon Access Road and Portola Parkway. A traffic control plan will be prepared to accommodate this work area corridor along the new SoCalGas pipeline route. These impacts would be short-term and temporary and would have a less than significant impact on circulation surrounding FRB Landfill.

During operations, the Project would result in very few vehicle trips for off-site access. There are no products from the facility that would be transported via vehicle. Off-site traffic would primarily be

commuting by the plant operators or periodic delivery vehicles during normal business hours. Therefore, operation of the Project would not result in an increase in vehicle trips beyond what is already addressed in current policies and/or forecasts and impacts would be less than significant.

There is no transit service along Bee Canyon Access Road or Portola Parkway. The Project would not impede transit service and no impacts would occur.

There are no bicycle lanes along Bee Canyon Access Road. There are on-street and off-street bicycle lanes along Portola Parkway (City of Irvine 2023c). During construction of the new SoCalGas pipeline, a portion of the on-street bicycle lane on the northwest bound side of Portola Parkway will require temporary closure. A traffic control plan will be prepared to accommodate this work area corridor along the new SoCalGas pipeline route. These impacts are expected to be less than significant as they would be short-term and temporary and would not impact long-term use of the bicycle lane.

There is no pedestrian sidewalk on the northwest bound side of Portola Parkway and no pedestrian facilities along Bee Canyon Access Road. Therefore, no significant impacts to pedestrian facilities are expected.

Mitigation Measures: No mitigation is required.

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

Less Than Significant Impact. Per the Orange County Local CEQA Procedures Manual (County of Orange 2020b), projects that demonstrate trip generation of less than 500 average daily trips (ADT) may be presumed to cause less than significant transportation impacts, unless the project conflicts with an adopted plan, substantially increases hazards, or results in inadequate emergency access.

As discussed in Section 3.4.17.a, the Project would generate less than 500 ADT and would not conflict with an adopted plan. As discussed in Section 3.4.17.c, the Project would not increase hazards. As discussed in Section 3.4.17.d, the Project would not result in inadequate emergency access. Therefore, the Project would have a less than significant transportation impact and would be consistent with CEQA Guidelines Section 15064.3(b).

Mitigation Measures: No mitigation is required.

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

No Impact. The proposed Project would not include construction of any new off-site roadways. Therefore, the proposed Project would not increase hazards due to design features and it would have no impact.

Mitigation Measures: No mitigation is required.

c. Would the project result in inadequate emergency access?

Less Than Significant Impact. Traffic control will be needed to temporarily reduce available lanes during construction of the new SoCalGas pipeline and street resurfacing, but full road closures are not anticipated during construction. Construction equipment staging for the Project would be within the

Project site. These impacts would be short-term and temporary and would not limit access to emergency services; therefore, no significant impact would occur.

Mitigation Measures: No mitigation is required.

3.4.18 Tribal Cultural Resources

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

PRC section 21074 defines tribal resources as follows:

(a) "Tribal cultural resources" are either of the following:

(1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

(A) Included or determined to be eligible for inclusion in the California Register of Historical Resources.

(B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

(2) 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.

(b) 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.

(c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique 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).

Existing Conditions:

As part of the data collection, a NAHC Sacred Lands File Search was requested on July 20, 2023. The NAHC replied on August 21, 2023, and the results were negative. OCWR initiated tribal consultation under Assembly Bill 52.

Discussion:

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

Less Than Significant With Mitigation Incorporated. Pursuant to notice provided on August 14, 2023, in accordance with PRC section 21080.3.1, the Kizh Nation (Tribe) requested consultation with Orange County regarding the Project, by letter dated August 25, 2023 (sent via email). Following this request, representatives from the Tribe and staff from OCWR engaged in consultation via telephone conference on October 17, 2023. OCWR sent the cultural resources report for the Project on May 24, 2024. The Kizh Nation representative provided comments on the report on May 28, 2024. These comments were incorporated into the cultural report and the final report was shared with the Tribe on July 8, 2024, and consultation was completed. To protect tribal cultural resources and potential unanticipated discoveries associated with tribal cultural resources, CUL-1, CUL-2, and CUL-3 were incorporated into this Project. Therefore, Project impact would be less than significant with mitigation incorporated, and no further analysis is required.

b. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in ©division (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Less Than Significant With Mitigation Incorporated. As identified in the response to 3.4.18 (a) above, consultation with the Kizh Nation is completed. Mitigation measures TCR-1, TCR-2, and TCR-3 to protect potential unanticipated discoveries associated with tribal cultural resources were incorporated into this Project. Therefore, project impact would be less than significant, and no further analysis is required.

Mitigation Measures.

TCR-1 Should evidence of human remains be discovered during project construction, the Orange County Coroner (OCC) shall be immediately notified of the discovery. Evidence of human remains requires mandatory compliance with the provisions of State Health

and Safety Code Section 7050.5, which restricts further disturbance in the vicinity of the discovery, defined herein as a 50-foot radius, until the OCC has made a determination within two business days of the origin and disposition pursuant to Public Resources Code Section 5097.98. If the remains are determined to be Native American, the OCC shall notify the Native American Heritage Commission (NAHC) within 24 hours that remains have been discovered. The NAHC shall determine the identity of the Most Likely Descendant (MLD). The MLD shall complete the inspection of the remains within 48 hours of notification by the NAHC. In addition, per CR-02, SoCalGas Project Archaeologist Ryan Glenn (425) 213-2349 (cell) and RGlenn1@scgcontractor.com or SoCalGas Archaeologist Tricia Dodds (213) 290-7449 (cell) and TDodds@socalgas.com shall be notified of the discovery.

TCR-2 If unanticipated tribal cultural resources or deposits are discovered during earth-moving activities, the following measures will be implemented:

- All work shall halt within a 200-foot radius of the discovery. a qualified professional archaeologist will assess the significance of the find (if a tribal cultural monitor is not present). If the resources are Native American in origin, the OCWR shall coordinate with the Tribe regarding evaluation, treatment, curation and preservation of these resources. The archaeologist will have the authority to modify the no-work radius as appropriate, using professional judgment in consultation with OCWR. Work will not continue within the no-work radius until the archaeologist conducts sufficient research, evidence and data collection to establish that the resource is either: (1) not cultural in origin; or (2) not potentially eligible for listing on the California Register of Historical Resources.

TCR-3 Tribal Cultural Resource Monitor: Prior to the issuance of any grading permit in which soil would be disturbed, Montauk shall provide evidence in the form of an executed Agreement to OCWR that they have retained a qualified Native American tribal monitor to provide third-party monitoring during excavation and grading activities and to recover and catalogue tribal resources as necessary. The tribal monitor shall be from or approved by the Kizh Nation. The agreement shall include (i) professional qualifications for the tribal cultural resource monitor(s); (ii) detailed scope of services to be provided including but not limited to pre-construction education, observation, evaluation, protection, salvage, notification, and/or curation requirements, as applicable, with final documentation/monitoring report to OCWR, as applicable; (iii) contact information; (iv) communication protocols between Contractor and Tribal Cultural Resource Monitor; (v) acknowledgment that if the Kizh Nation monitor is not available, Montauk or their contractor as designee may contract with another qualified tribal monitor acceptable to the OCWR. The selection of the qualified professional(s) shall be subject to OCWR acceptance based on generally accepted professional qualifications and certifications, as applicable. The cover sheet of the grading plans shall include a note to identify that third party tribal monitoring is required during excavation and grading activities in accordance the with the OCWR Agreement.

3.4.19 Utilities and Service Systems

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

Existing Conditions:

Reclaimed water is supplied to the FRB Landfill by an Irvine Ranch Water District (IRWD) reclaimed water line that feeds into a 100,000-gallon reclaimed water tank, located adjacent to the FRB landfill administration building (about 400 feet north of the Project RNG site). Potable water is supplied by an IRWD potable water line that currently supplies water to the Bowerman Power Plant and the FRB Landfill site operations building and crew quarters. Sewage from the FRB landfill administration and crew quarters buildings currently goes to an on-site septic system and leach field. The Bowerman Power Plant is served by a separate on-site septic system and leach field.

Stormwater runoff generated within the FRB Landfill boundary is contained in concrete sedimentation basins owned, operated, and maintained by OCWR. Stormwater contained in the concrete detention basins discharge to the Bee Canyon Retarding Basin owned by the OCFCD via Bee Canyon Wash.

Electrical power service is provided by SCE and natural gas will be provided by SoCalGas. SCE, SoCalGas, and local telecommunications companies operate and maintain transmission and distribution infrastructure in the Project area.

Discussion:

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

Less Than Significant Impact. New distribution lines will be needed for both potable and non-potable water systems, as well as a new collection line for the wastewater system (an on-site septic process) for the RNG Plant. Neither addition will cause significant changes in the volumes of water consumed or treatment capacity needs of the FRB landfill operations. No changes will be needed to the existing sediment basins within the FRB landfill, though a site-specific bioretention basin will be provided on the proposed Project site. Other utilities and service systems would require only minor connection modifications, which will all meet design and construction code requirements for the RNG Plant. The environmental effects associated with these necessary on-site utilities and service systems improvements will be in compliance with established regulatory requirements. Therefore, any environmental effects from the proposed utility improvements would be less than significant.

Mitigation Measures: No mitigation is required.

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

Less Than Significant Impact. The Project (RNG Plant and new SoCalGas pipeline) will use an estimated 350,000 gallons of non-potable water during construction activities (for soil compaction, dust suppression, etc.). Non-potable water for construction activities will either be supplied from existing on-site FRB Landfill water tanks or trucked in from an off-site provider. During operations, the RNG Plant system initially will require 1,000 gallons of water to supply the chiller system. Typically, no additional water will be required for the system except during non-routine maintenance. Personal water use during operations (bathroom, sink, shower, etc.) is estimated to be 110,000 gallons per year. Per Bowerman Power's agreement with OCWR, water for RNG Plant maintenance and personal water use will be supplied by OCWR from the existing domestic water line that currently serves the Bowerman Power Plant.

The IRWD 2020 Urban Water Management Plan (UWMP) includes an assessment of its water service reliability to ensure that adequate water supplies are available to meet existing and future demands (Irvine Ranch Water District 2021). The UWMP found that the total water supplies available to IRWD will meet the projected water demands of existing and planned uses through 2040 under a single dry-year condition and over five years of consecutive drought, as well as in normal year conditions. Therefore, it is expected that there will be sufficient water supplies to serve the Project and impacts would be less than significant.

Mitigation Measures: No mitigation is required.

c. Would the project result in a determination by the wastewater treatment provider that 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. During construction for the RNG Plant and new SoCalGas pipeline, a portable toilet service will be provided for construction workers. During operation, the RNG Plant will have restroom and washing facilities. Sanitary waste will be treated by a septic system within the FRB Landfill. Therefore, the Project will not increase demand on a wastewater treatment provider and no impact will occur.

Mitigation Measures: No mitigation is required.

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

Less Than Significant Impact. The Project RNG Plant and new SoCalGas pipeline construction would produce little solid waste during operations. Although the Project would require the disposal of clearing and grubbing waste (vegetation), as well as construction and demolition debris during the construction process (soil, asphalt, demolished materials, etc.), the generation of these materials would be short term in nature and would not have the capability to substantially affect the capacity of regional landfills. Therefore, impacts would be less than significant.

Mitigation Measures: No mitigation is required.

e. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact. The proposed Project would comply with all federal, state, and local statutes and regulations related to solid waste, including the California Integrated Waste Management Act and OCWR requirements for solid waste generated during the construction process; therefore, no impact would occur.

Mitigation Measures: No mitigation is required.

3.4.20 Wildfire

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

Existing Conditions:

The Project site (RNG Plant and new SoCalGas pipeline) is located in an SRA Very High Fire Hazard Severity Zone (OSFM 2023). The OCFA would provide fire services to the proposed Project site. The OCFA is a regional fire agency that services 23 cities in Orange County, including all of the unincorporated areas of the County (OCFA 2023). Within its service area, the OCFA protects approximately 2 million residents. In order to fulfil this service area, the OCFA has a total of 78 fire stations located throughout the County (OCFA 2023). The nearest fire station is Orange County Fire Station 55 located at 4955 Portola Parkway in the City of Irvine, approximately 2.2 miles northwest of the proposed Project site.

Discussion:

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones:

a. Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. As discussed in Section 3.4.9., due to its location in a high fire hazard severity zone, Project implementation would conform to CBC Chapter 7A (CBC 2022; Materials and Construction Methods for Exterior Wildfire Exposure) and California Fire Code Chapter 47 (CFC 2022: Requirements for Wildland-Urban Interface Fire Areas), which would reduce the risk of loss, injury or death from wildland fires. The RNG Plant will include emergency systems including fire suppression systems. A traffic control plan will be prepared to accommodate the work area corridor along the new

SoCalGas pipeline route. Implementation of consistency measures, appropriate design criteria, and adherence to applicable requirements of CBC Chapter 7A and California Fire Code Chapter 47, would ensure that Project impacts on emergency response and evacuation would be less than significant.

Mitigation Measures: No mitigation is required.

b. Would the project, 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 Impact. The RNG Plant site and new SoCalGas corridor do intersect with hilly terrain that varies in elevation from approximately 780 feet at the northern end of the RNG Plant site to approximately 340 feet at the end of the new SoCalGas pipeline at the corner of Portola Parkway and Jeffrey Road. The RNG Plant site will be located on a flat area, constructed with fill, that will be devoid of vegetation or other fuel sources. An additional 0.8 acre will be cleared of vegetation, see the area shown in red and yellow on Figure 2-11, to comply with OCFA's Fuel Modification and Maintenance Program. Another 0.05 acre will be cleared of vegetation and trenched for installation of a fire suppression water line. Post construction, the areas shown in red, blue, and yellow on Figure 2-11 will be revegetated with low fuel vegetation approved by OCFA and OCWR.

Access to the RNG Plant would be via Bee Canyon Access Road, a paved road. Accordingly, access to and from the RNG Plant would not be substantially encumbered due to a wildfire and persons on the Project site would be able to readily evacuate if necessary. With respect to the new underground SoCalGas RNG transmission pipeline, SoCalGas employees would conduct inspection and maintenance from time to time but would not regularly be in the pipeline corridor. In addition to meeting National Fire Protection Association safety standards and County Regulations as discussed in Section 3.4.15.a, construction plans for the RNG Plant would be reviewed and approved by the OCFA. With the preceding consideration, wildfire risk to persons at the RNG Plant would be less than significant.

Mitigation Measures: No mitigation is required.

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

Less Than Significant Impact. As discussed above in Section 3.4.20.a, construction plans for the Project would be reviewed and approved by the OCFA. Compliance with all National Fire Protection Association safety standards and County regulations would ensure that temporary or ongoing impacts to the environment due to wildfires would be less than significant.

Mitigation Measures: No mitigation is required.

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

Less Than Significant Impact. Construction of the Project RNG Plant site pad will employ engineered fill that will reduce the general slopes of the Project area, and replace native slopes with more stable engineered slopes. Also, as discussed in Section 3.4.7.a.iv, neither the proposed Project site, nor the new pipeline route, will be located on materials prone to landslide. Both project parts have been assessed as having potential for less than significant impacts due to landslides. In addition, Project design of the RNG plant will include an on-site bioretention basin and will implement a site-specific SWPPP during construction and operation (see Section 3.4.10.c.ii). The new pipeline route is located primarily in road rights-of-way that have been previously stabilized, and will only require trenching during placement. As a result, the proposed Project is expected to have less than significant impacts due to flood flows. Therefore, no significant impacts due to landslide, drainage, or flooding are expected, even under post-fire scenarios.

Mitigation Measures: No mitigation is required.

3.4.21 Mandatory Findings of Significance

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

Discussion:

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

Less than Significant Impact with Mitigation Incorporated. As discussed in Section 3.4.4, Biological Resources, with adherence to Mitigation Measures **BIO-1, BIO-2, and BIO-3,** the proposed Project would not have the potential to substantially degrade the quality of the existing environment, reduce habitat of fish or wildlife species, threaten plant or animal communities, and/or reduce the number or restrict the range of rare plants or animals.

In addition, as discussed in Section 3.4.5, Cultural Resources and 3.4.7, Geology and Soils, development of the FRB Landfill and associated infrastructure has disturbed the natural surface and subsurface deposits of the Project site and pipeline route. Intact cultural material may exist within undisturbed deposits. Adherence to Mitigation Measures **CUL-1, CUL-2, CUL-3**, **GEO-1, TCR-1, TCR-2, and TCR-3** would be required in the event unexpected resources are uncovered during the grading and excavation process. With implementation of recommended mitigation, the proposed Project is not expected to eliminate important examples of the major periods of California history or prehistory, and impacts would be less than significant.

Mitigation Measures: Mitigation Measures **BIO-1, BIO-2, BIO-3, CUL-1, CUL-2, CUL-3, GEO-1, TCR-1, TCR-2, and TCR-3.**

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

Less than Significant Impact. The Project would enable fuller utilization of the LFG gas generated at FRB Landfill that would otherwise be burned in the flares. The Project would not result in substantial population growth within the area, either directly or indirectly. Although the Project may incrementally affect other resources at a less than significant level, the Project's contribution to these effects is not considered "cumulatively considerable," in consideration of the relatively nominal impacts of the Project and the mitigation measures provided to lessen impacts. In addition, the proposed project will help reduce greenhouse gas emissions in the long-term by converting landfill gas that is currently flared into electricity, thereby utilizing a renewable energy resource. Therefore, cumulative impacts would be considered less than significant.

Mitigation Measures: No additional mitigation is required beyond what is already included previously.

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

Less than Significant Impact. Previous sections of this Initial Study/Mitigated Negative Declaration reviewed the proposed Project's potential impacts related to aesthetics, air quality, geology and soils, greenhouse gases, hydrology/water quality, noise, hazards and hazardous materials, traffic, and other issues. As concluded in these previous discussions, the proposed Project would result in less than significant environmental impacts; therefore, the proposed Project would not result in environmental impacts that would cause substantial adverse effects on human beings and impacts would be less than significant.

Mitigation Measures: No mitigation is required.

4.0 LIST OF PREPARERS

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FIGURES

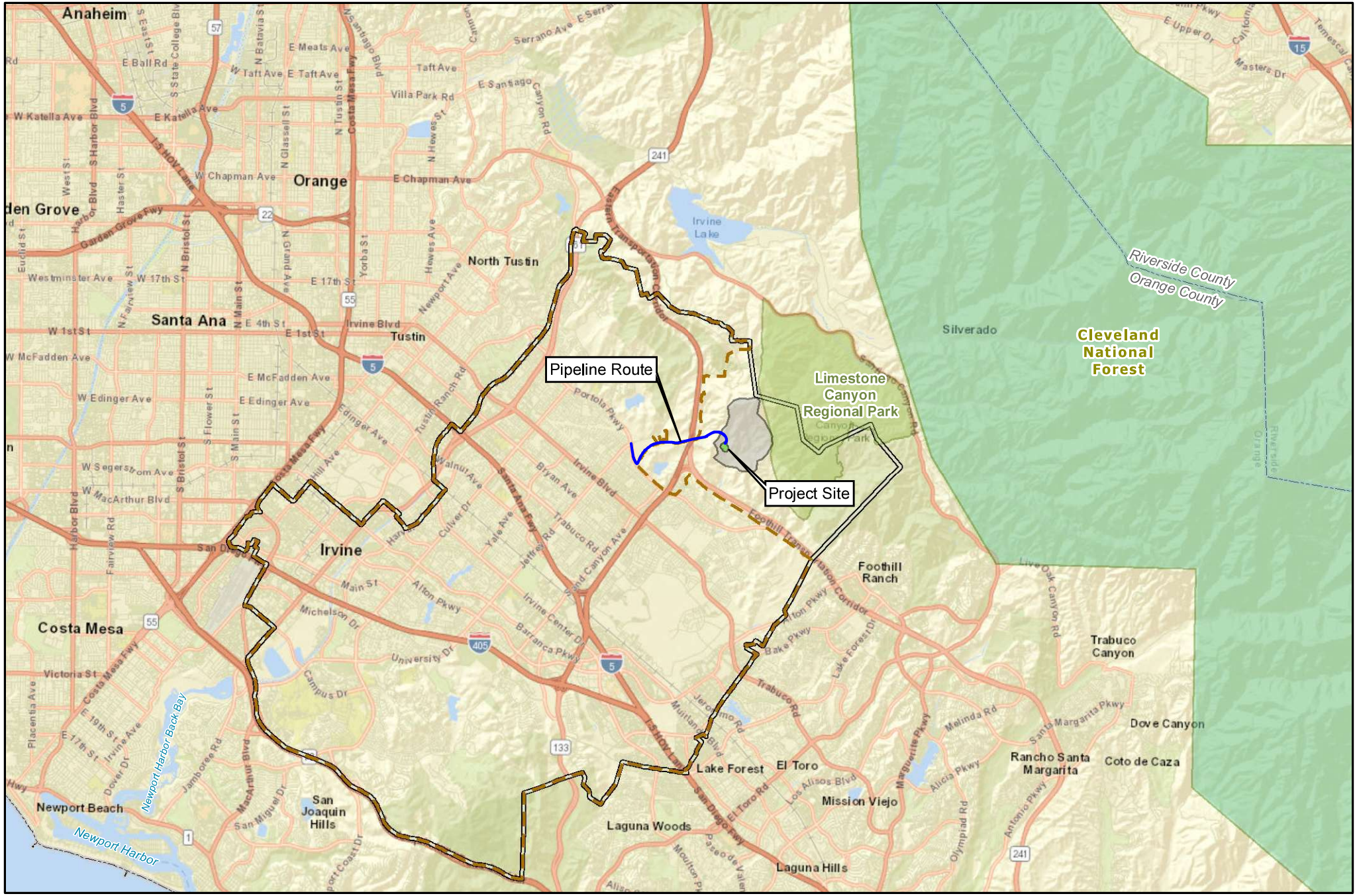


Figure 2-1
Project Vicinity

Bowerman Power RNG Plant Project
Orange County, CA

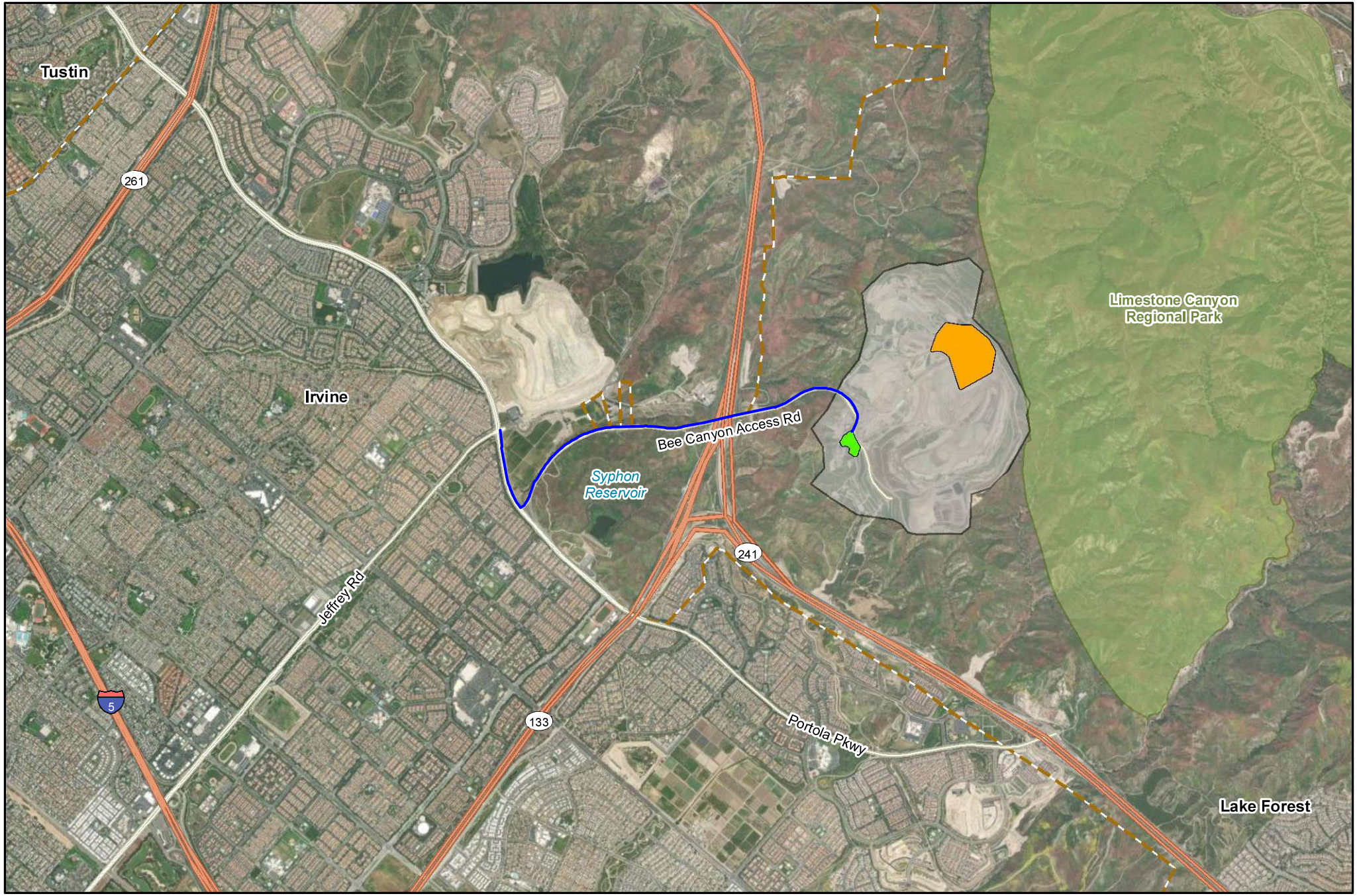


Figure 2-2
Project Location

Bowerman Power RNG Plant Project
Orange County, CA

Project Lease Boundary
Project Site
Pipeline Route
Bowerman Landfill
Bowerman Landfill Soil Stockpile Area
Disturbed Area for Grading Replanted for Fire Fuel Modification
Fuel Modification Area
Temporary Disturbed Area for Trenching
Fire Water Line

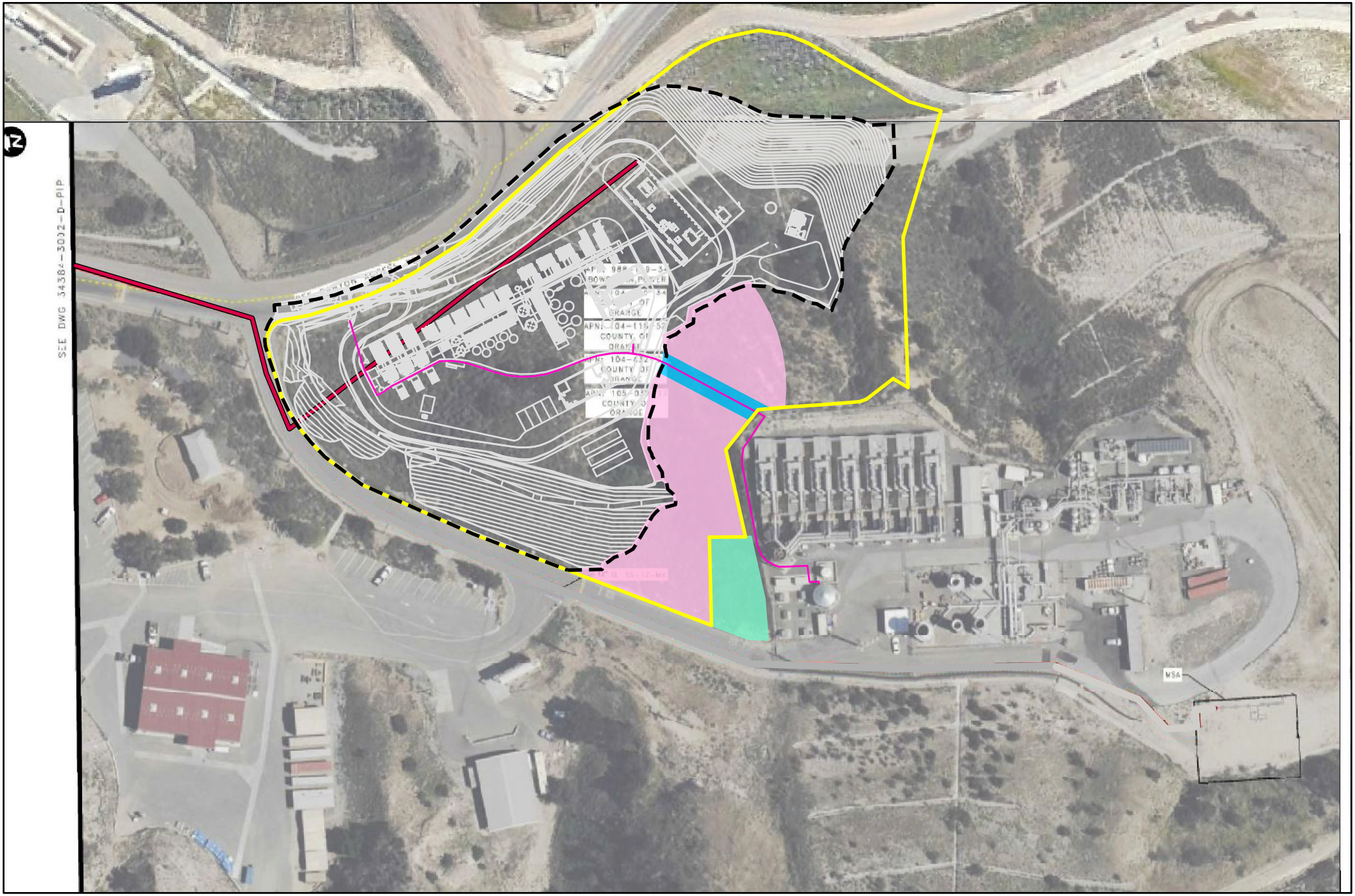
NOT FOR CONSTRUCTION

N

0 250 500 1,000 Feet

Figure 2-3
Project RNG Plant Site and Borrow Area Locations

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route (underground)

Project Lease Boundary

Project Site

NOT FOR CONSTRUCTION

Fire Water Line (underground)

Disturbed Area for Grading Replanted for Fire Fuel Modification

Fuel Modification Area

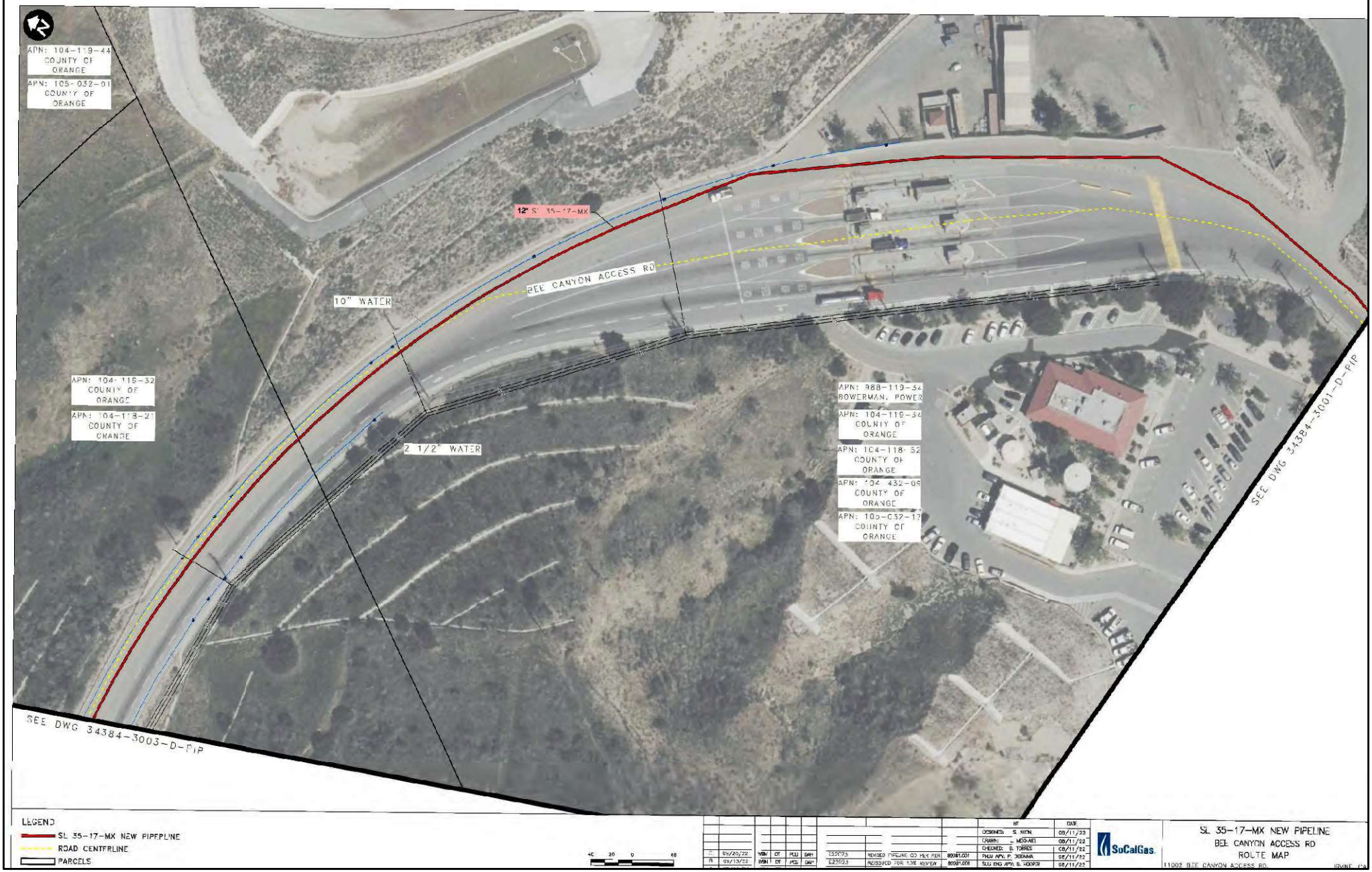
Temporary Disturbed Area for Trenching

N

0 25 50 100 Feet

Figure 2-4.1
Pipeline Route
Sheet 1 of 12

Bowerman Power RNG Plant Project
Orange County, CA



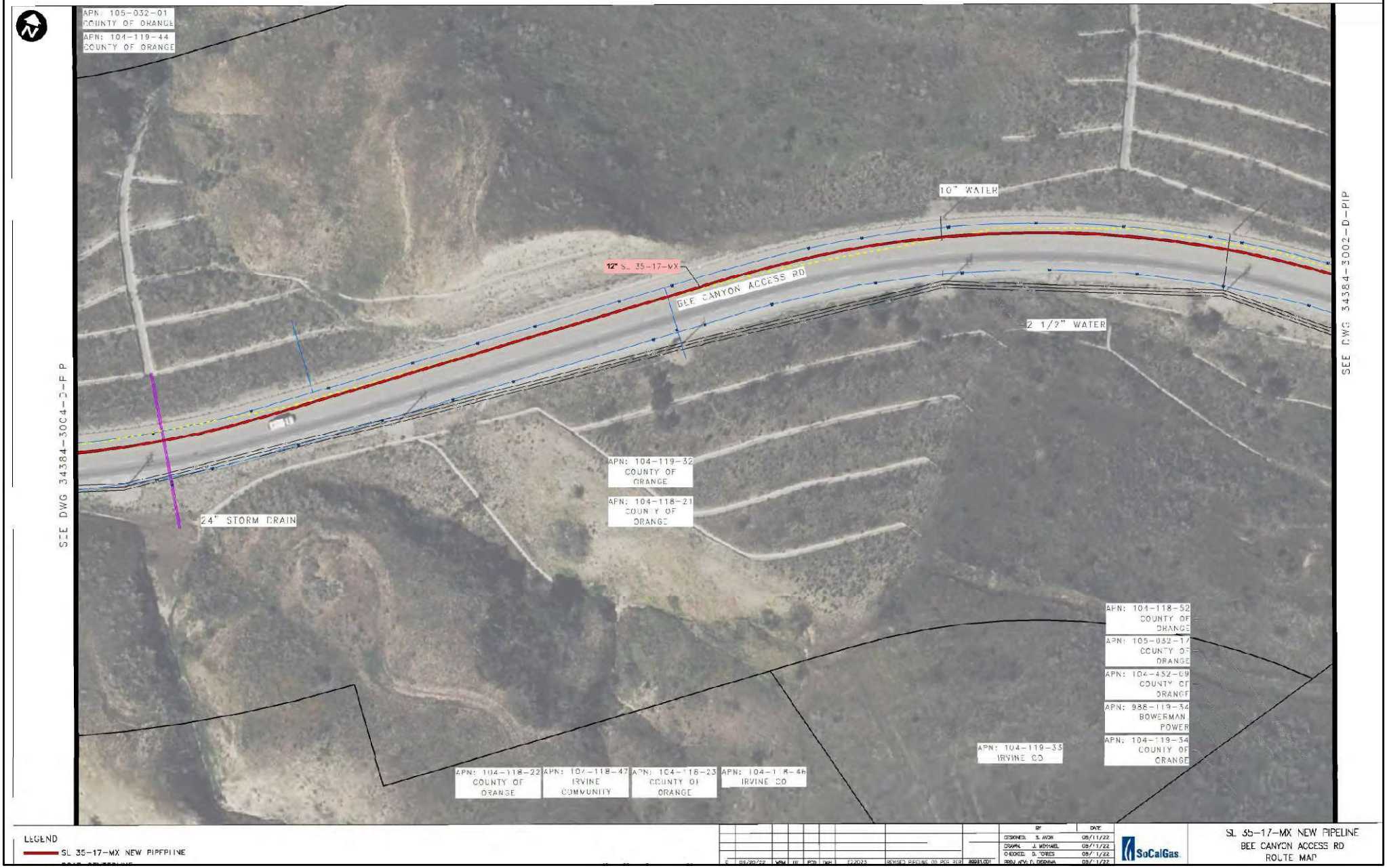
Pipeline Route (underground)

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 2-4.2
Pipeline Route
Sheet 2 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route (underground)

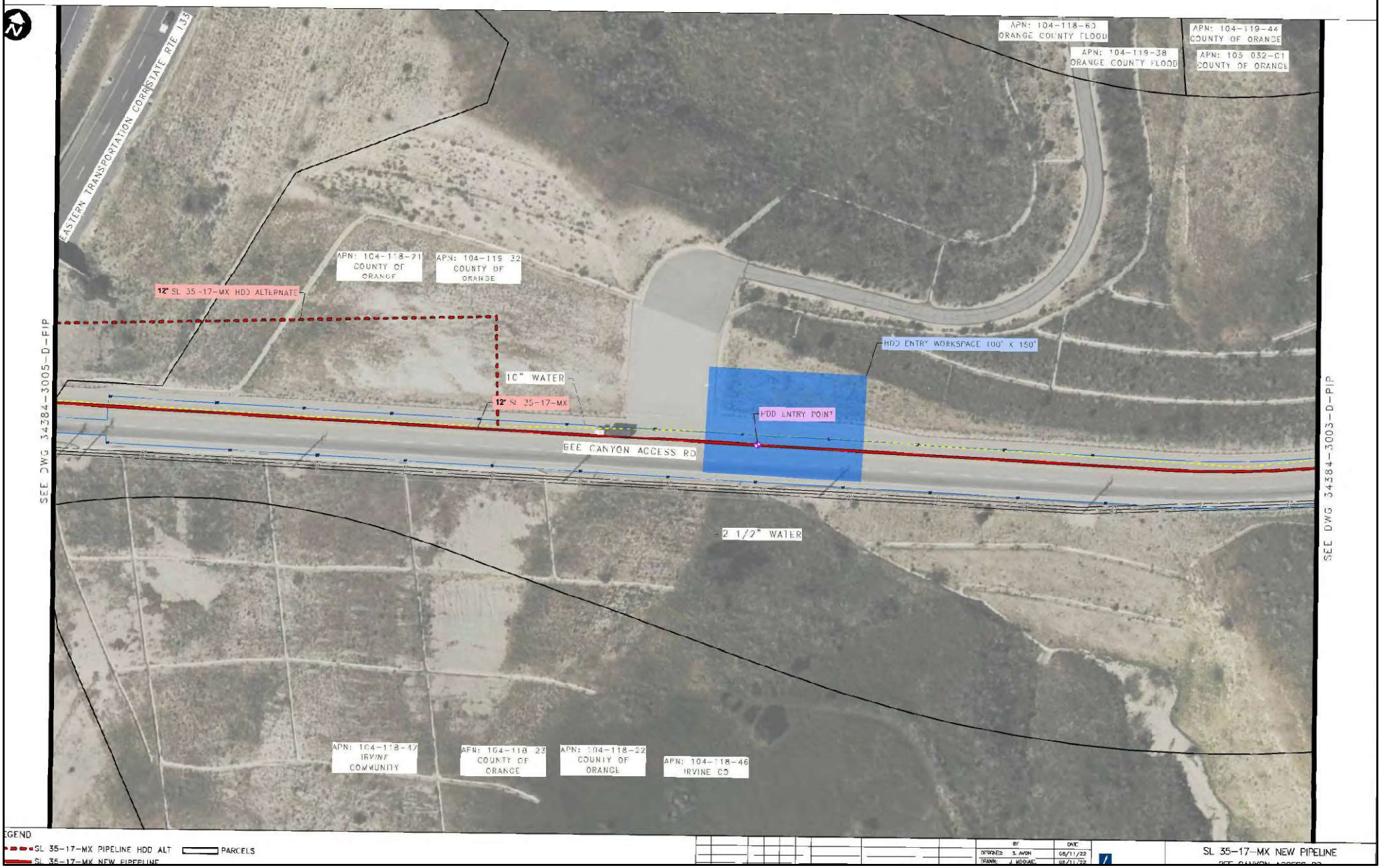
N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 2-4.3
Pipeline Route
Sheet 3 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route (underground)

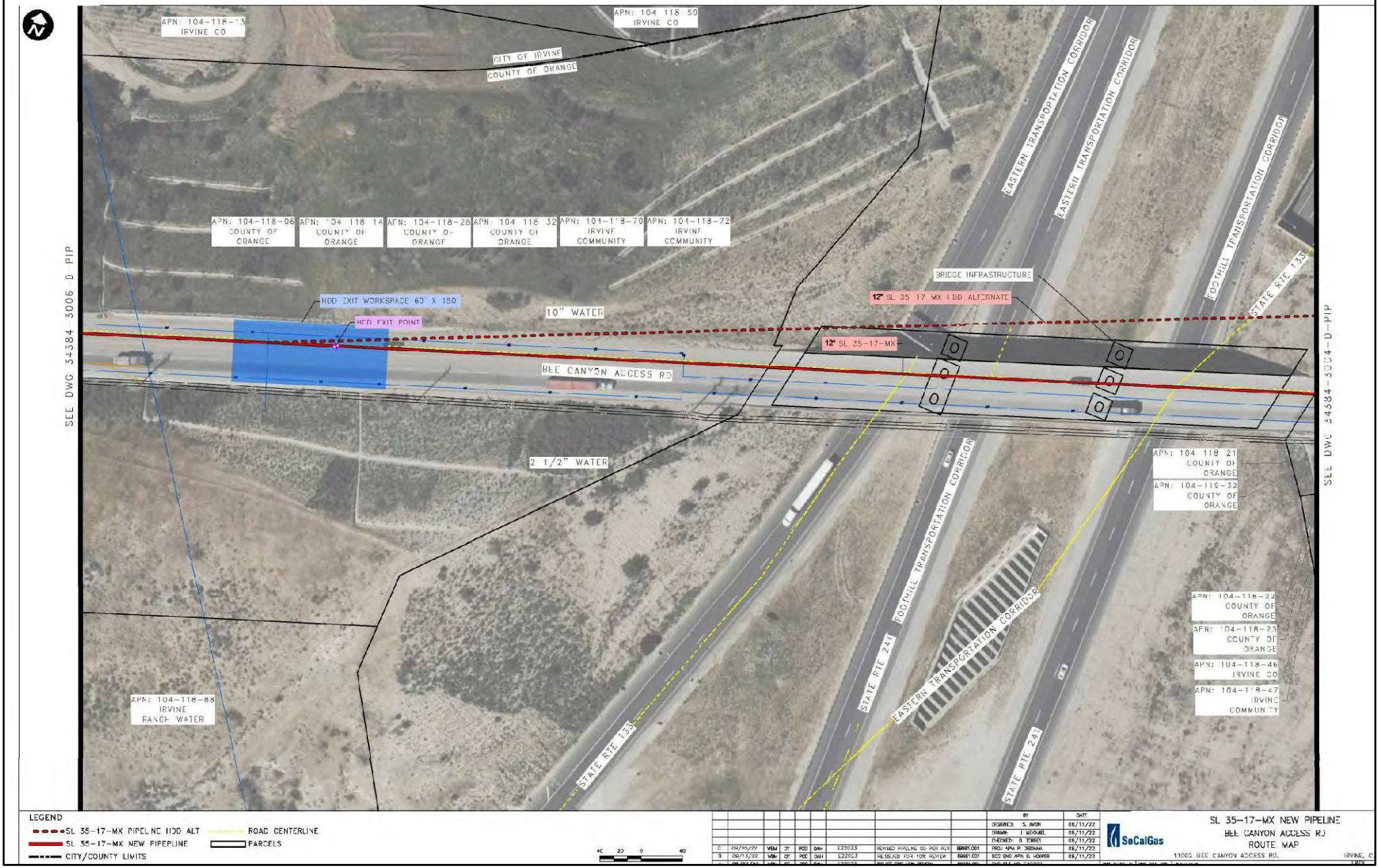
N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 2-4.4
Pipeline Route
Sheet 4 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route (underground)

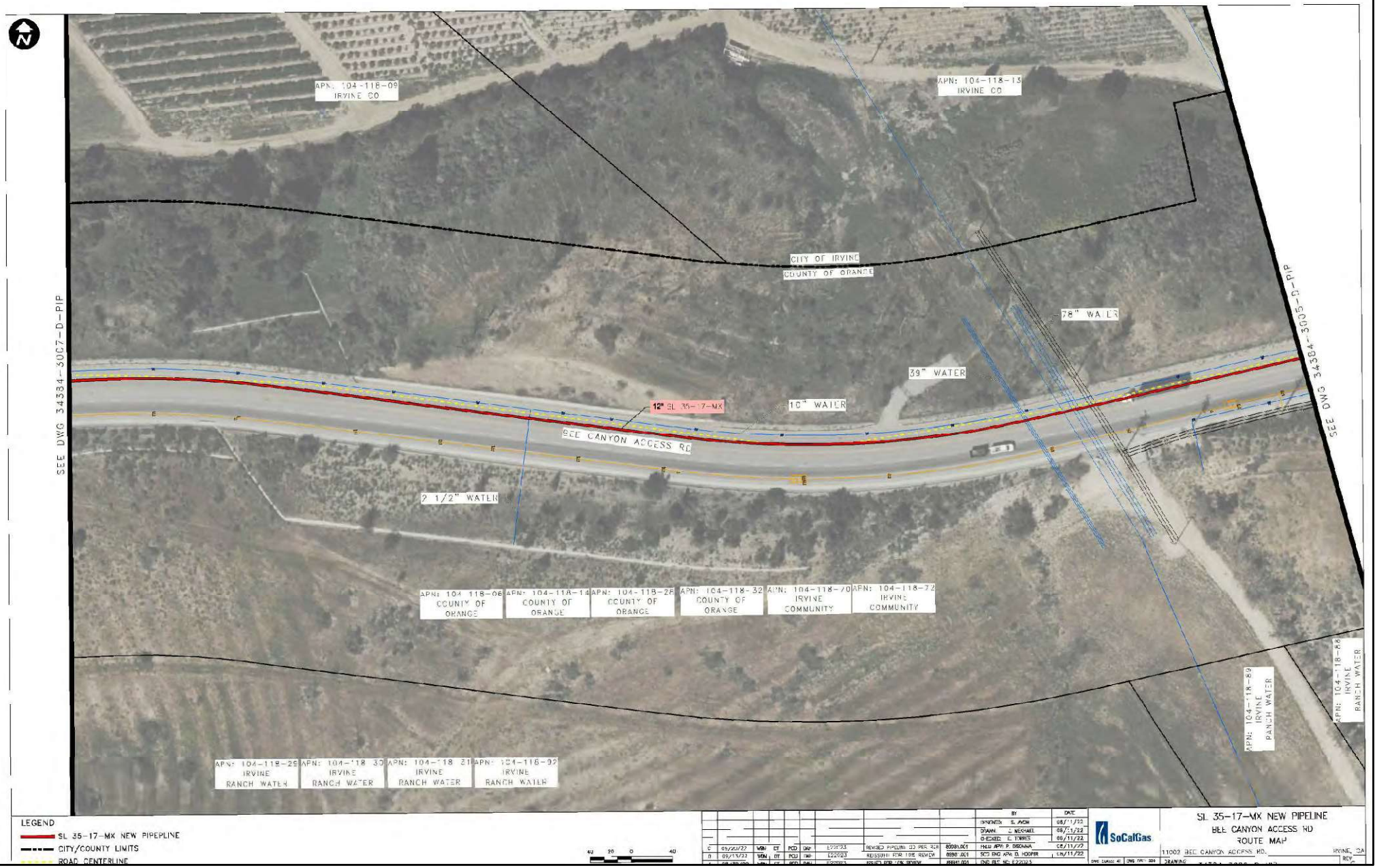
NOT FOR CONSTRUCTION

N

0 25 50 100 Feet

Figure 2-4.5
Pipeline Route
Sheet 5 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route (underground)

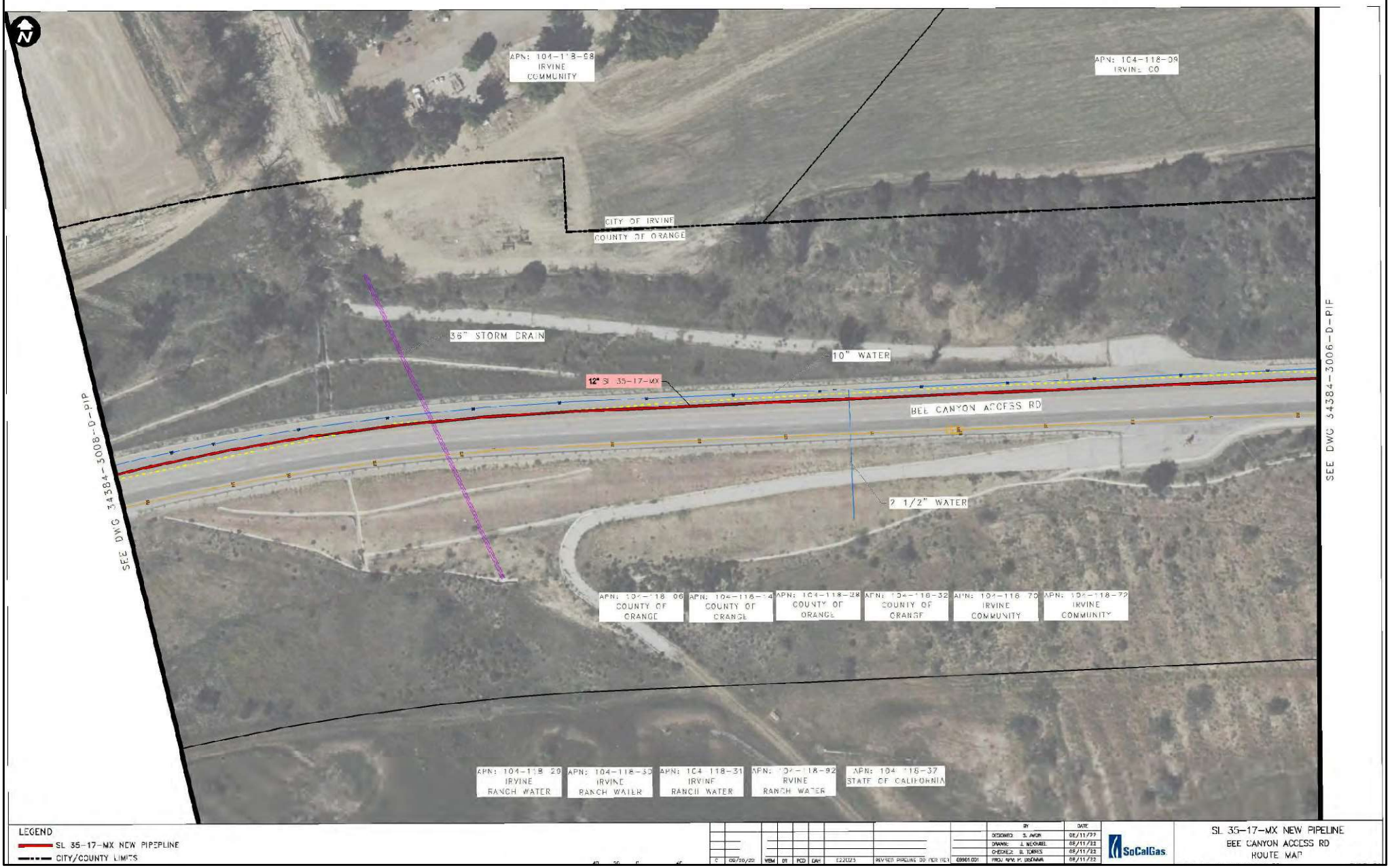
N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 2-4.6
Pipeline Route
Sheet 6 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route (underground)

N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 2-4.7
Pipeline Route
Sheet 7 of 12

Bowerman Power RNG Plant Project
Orange County, CA

Pipeline Route (underground)

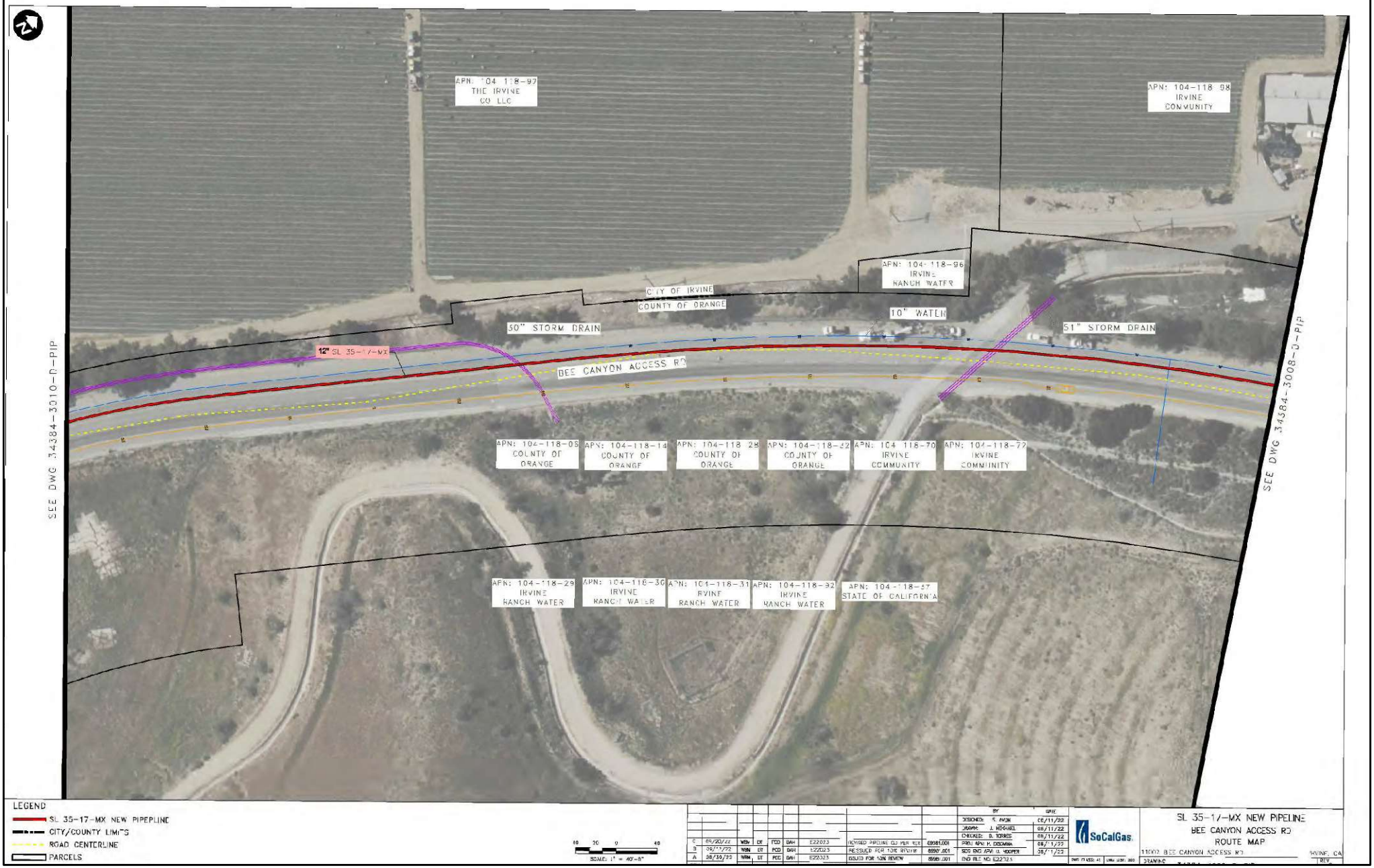
N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 2-4.8
Pipeline Route
Sheet 8 of 12

Bowerman Power RNG Plant Project
Orange County, CA



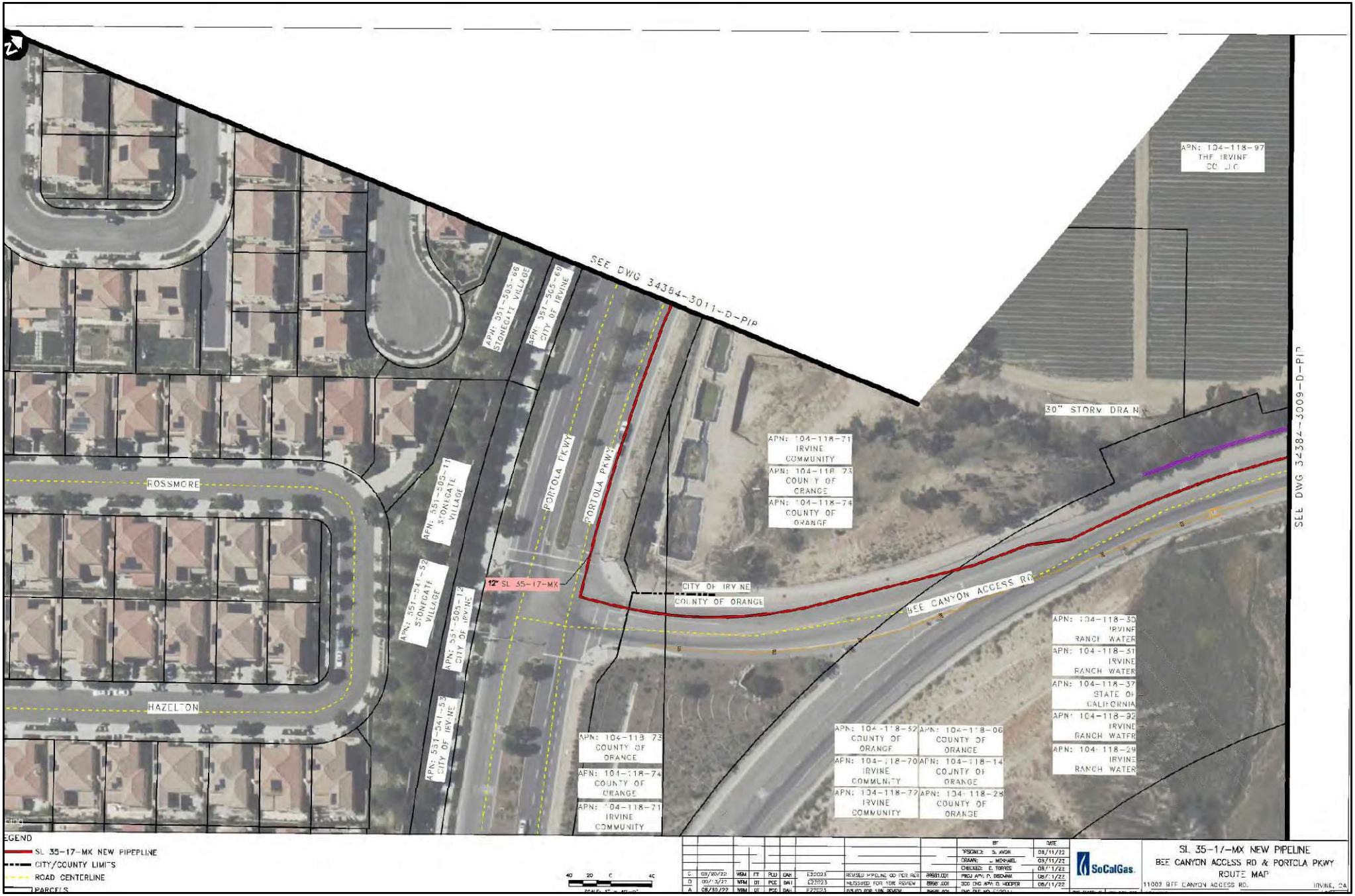
Pipeline Route (underground)

NOT FOR CONSTRUCTION

0 25 50 100 Feet

Figure 2-4.9
Pipeline Route
Sheet 9 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route (underground)

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 2-4.10
Pipeline Route
Sheet 10 of 12

Bowerman Power RNG Plant Project
Orange County, CA

Pipeline Route (underground)

N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 2-4.11
Pipeline Route
Sheet 11 of 12

Bowerman Power RNG Plant Project
Orange County, CA

Pipeline Route (underground)

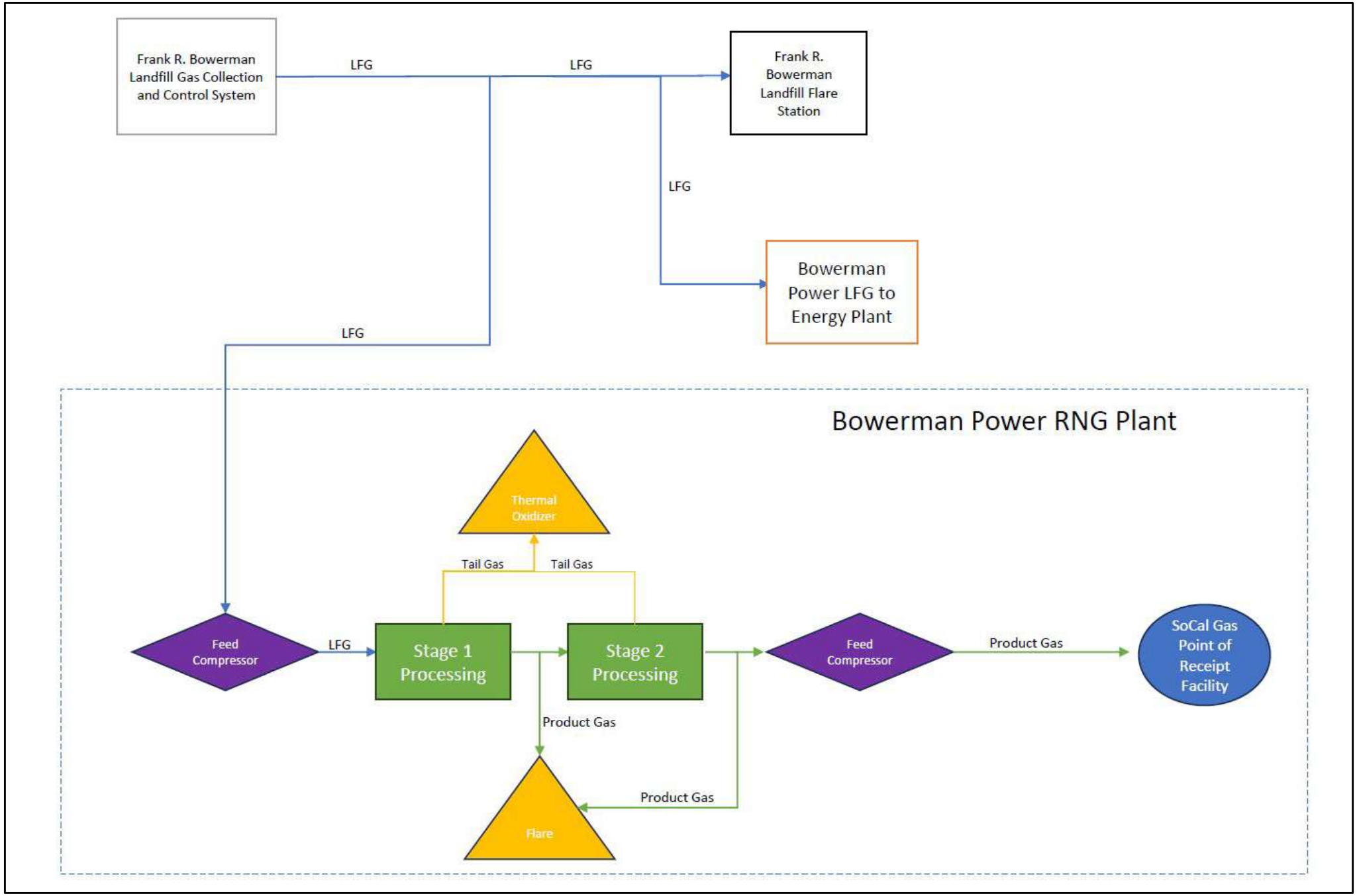
N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 2-4.12
Pipeline Route
Sheet 12 of 12

Bowerman Power RNG Plant Project
Orange County, CA



NOT FOR CONSTRUCTION

Figure 2-5
RNG Process Design Flow

Bowerman Power RNG Plant Project
Orange County, CA

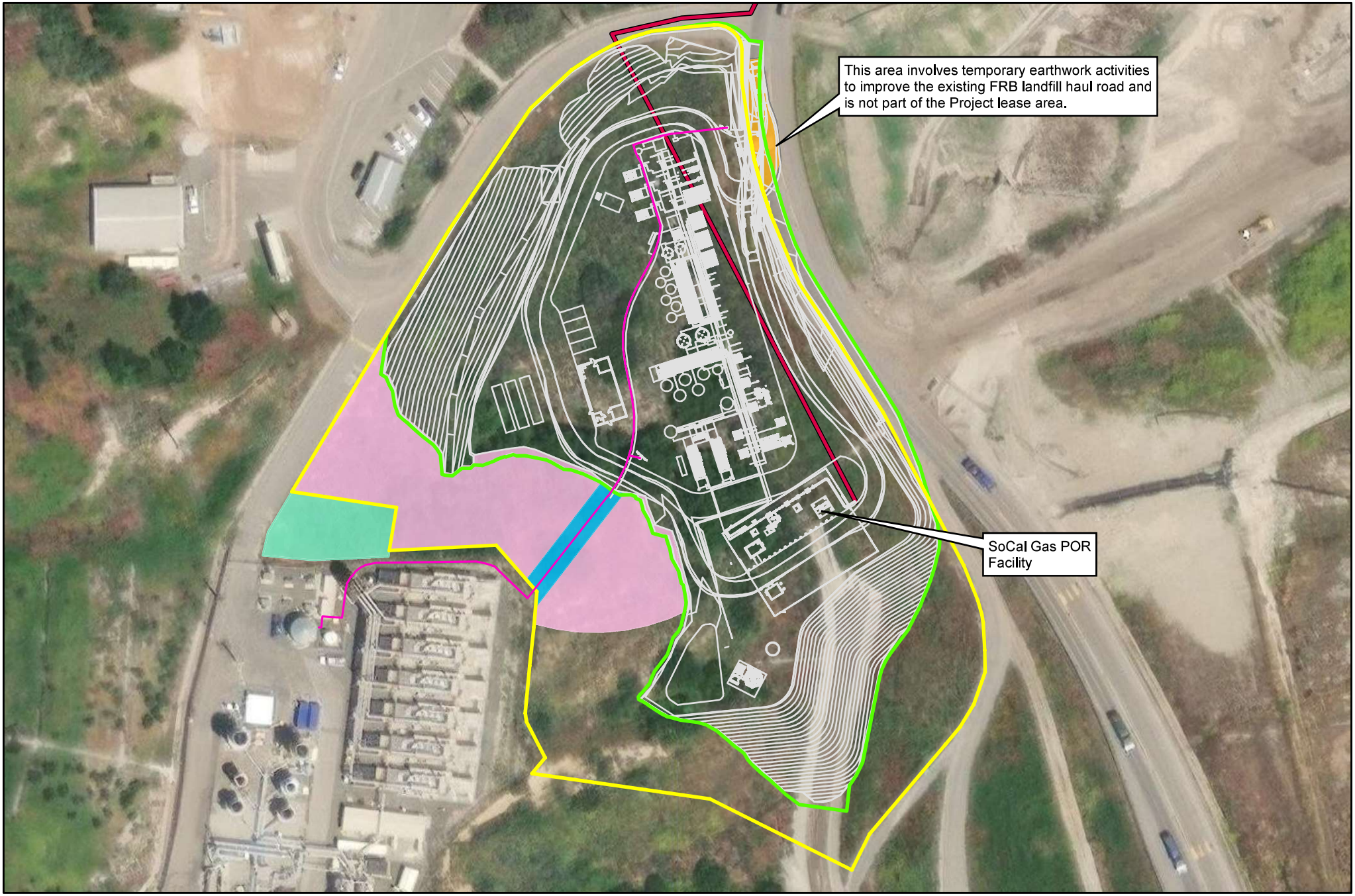
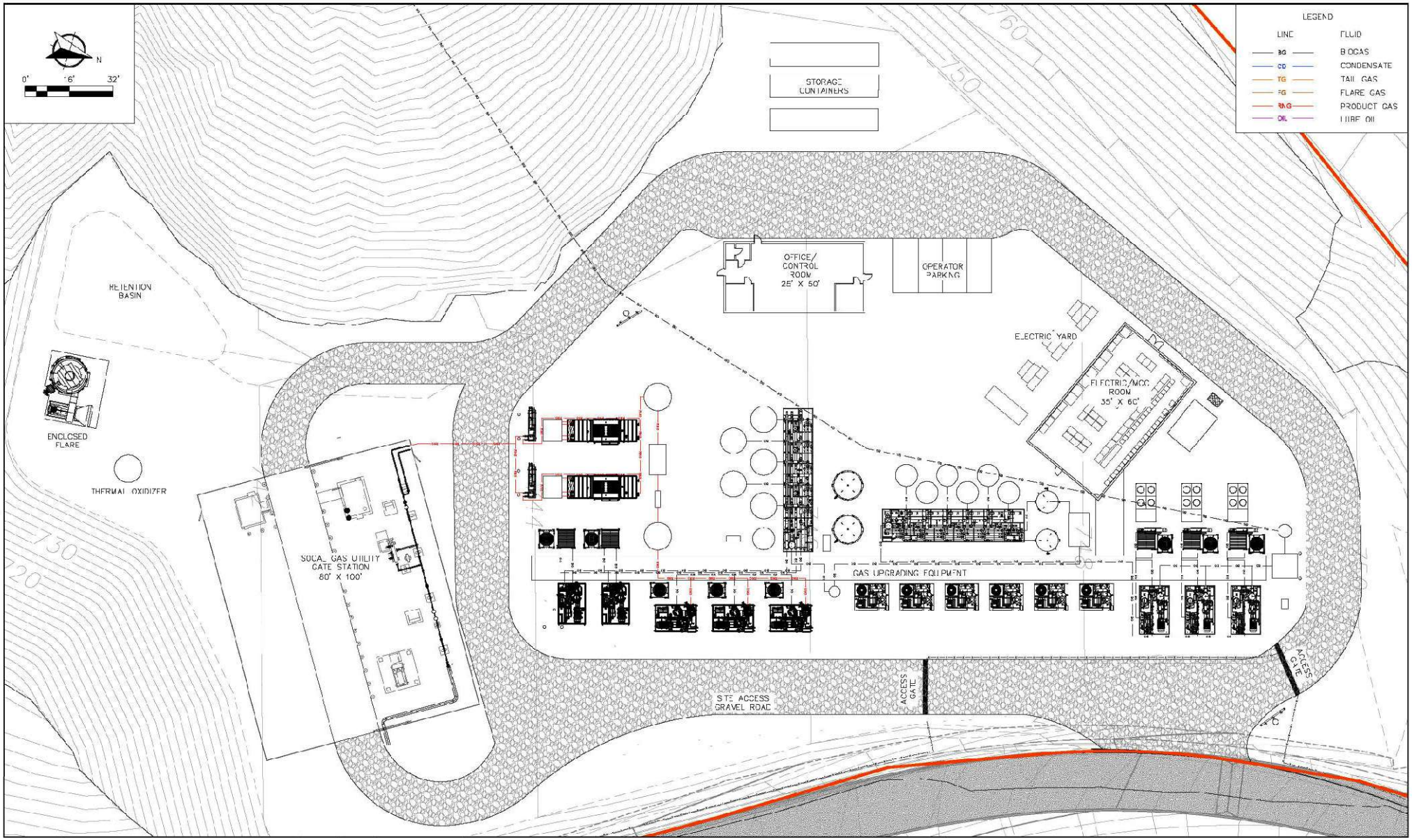


Figure 2-6
Project Site Plan

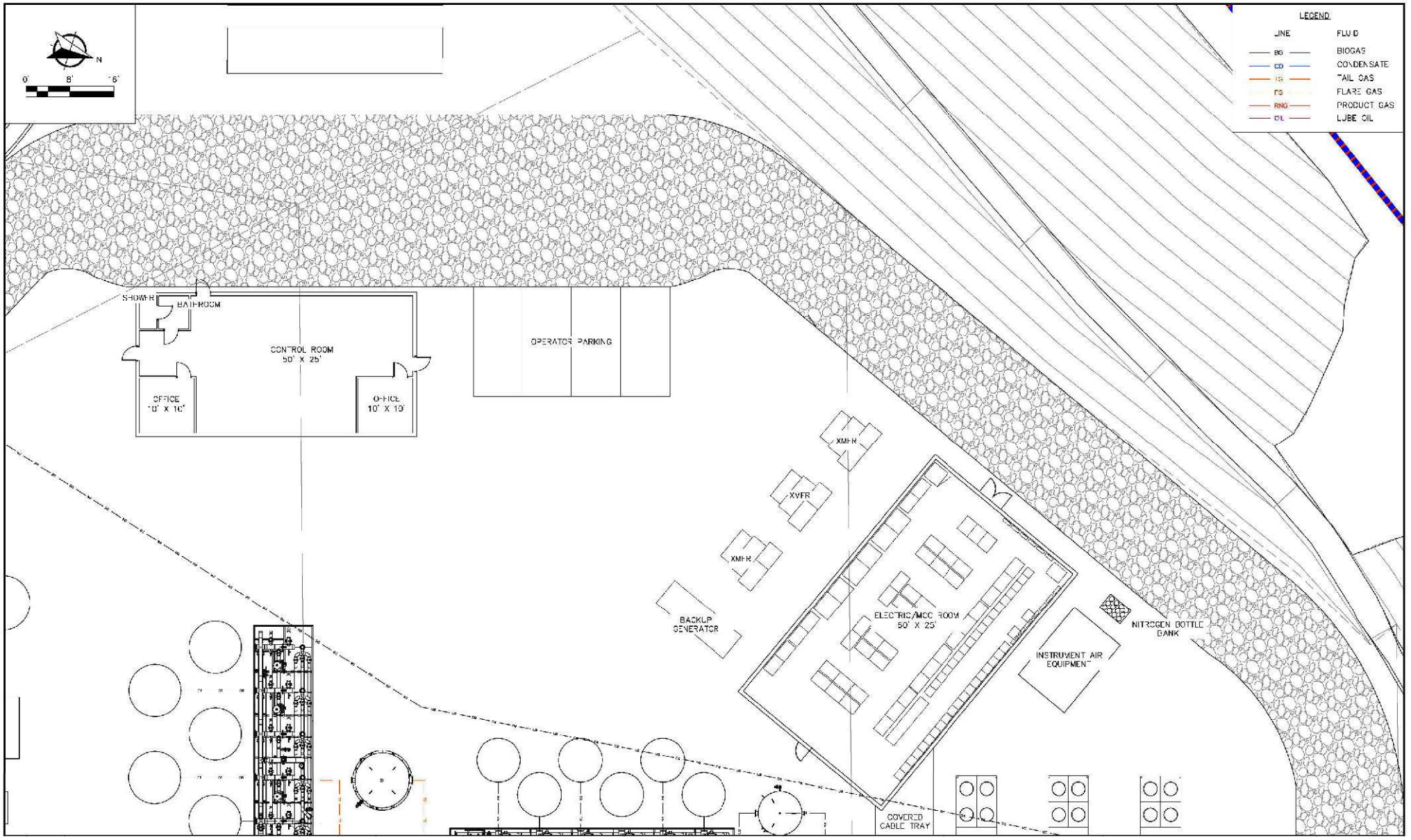
Bowerman Power RNG Plant Project
Orange County, CA



NOT FOR CONSTRUCTION

Figure 2-7
Process Equipment Layout

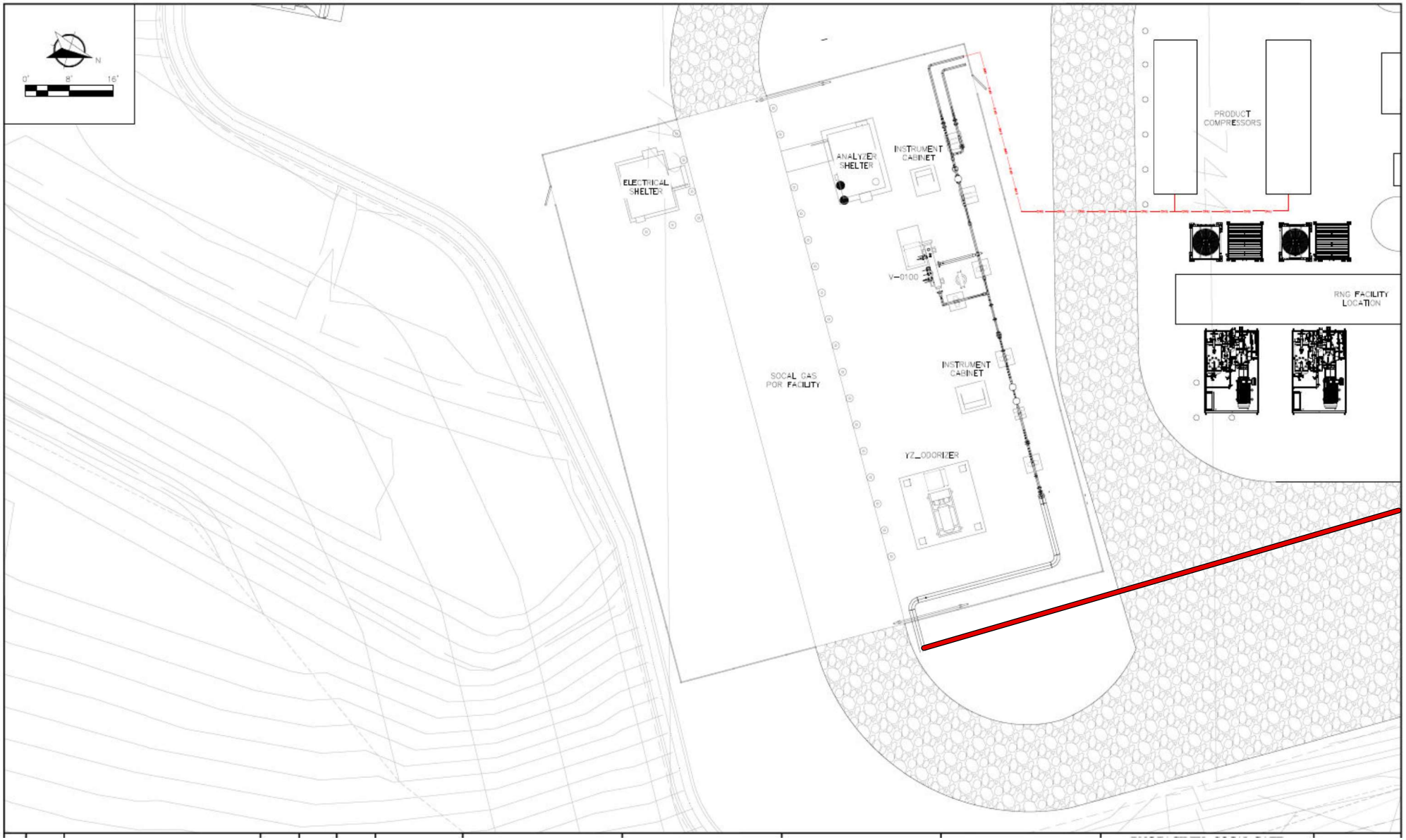
Bowerman Power RNG Plant Project
Orange County, CA



NOT FOR CONSTRUCTION

Figure 2-8
RNG Control / Electric Buildings Layout

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route (underground)

NOT FOR CONSTRUCTION

Figure 2-9
Point of Receipt Facility

Bowerman Power RNG Plant Project
Orange County, CA

RNG Plant Construction

Equipment Type	Quantity
Dump Truck	10-15
Trackhoe	2
Bulldozer	2
Street Sweeper	1
Water Truck	1
Mixer	1
40 Ton Crane	1
100 Ton Crane	1
Extended Boom Forklift	1
Man Lift	1
Skid Steer Loader	1
Grader	1

Pipeline Construction

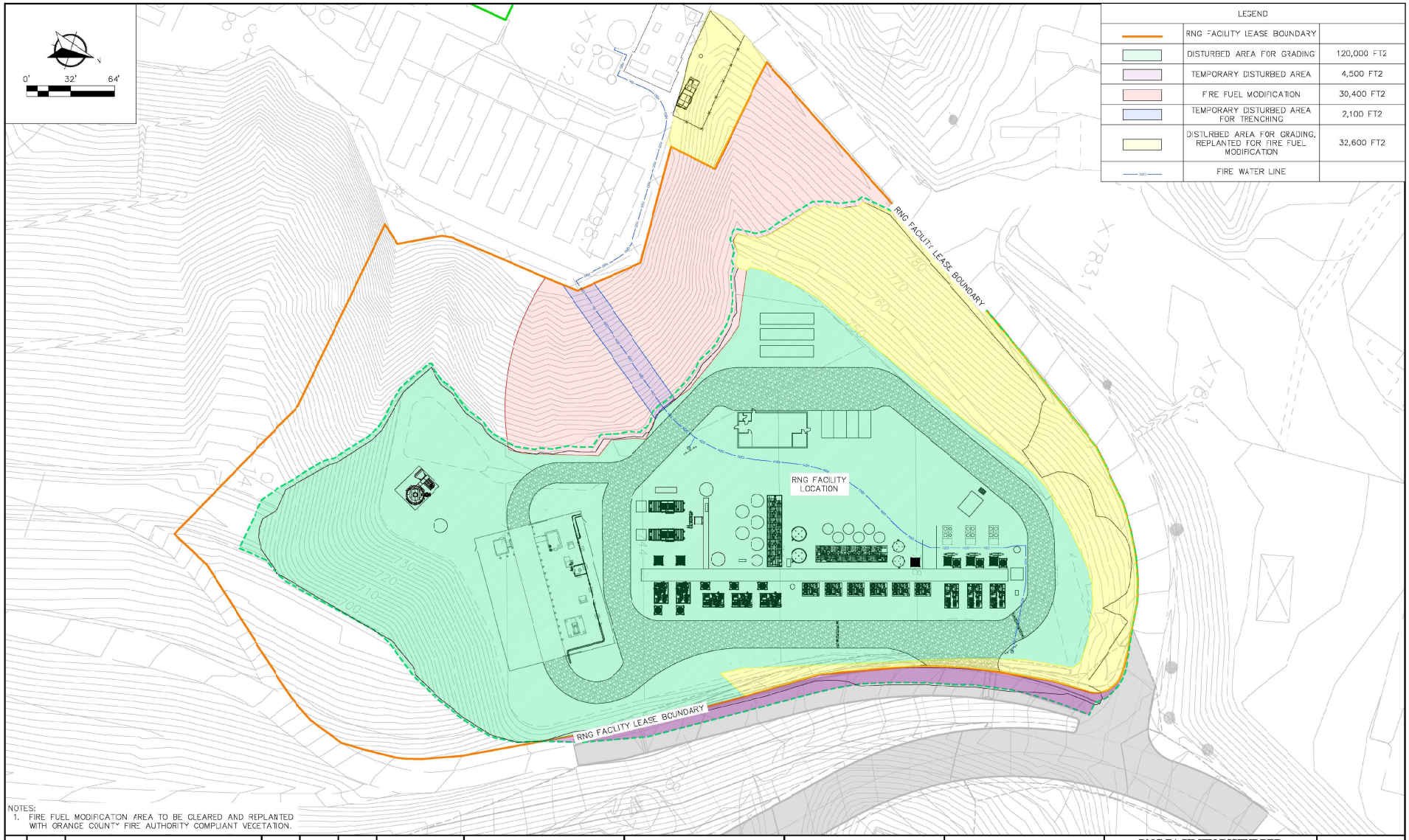
Equipment Type	Quantity
Boring Machine	1
Trackhoe	1
Bulldozer	1
Backhoe	1
Crane	1
Motor Grader	1
Pneumatic Hammer	1
Air Compressor	1
Side Boom Tractor	1
Tractor Tailer	1
Paver	1
Paving Equipment	1
Roller	1
Cement Mixer	1

RNG Plant Operation

Equipment Type	Quantity	Inside Enclosure (Yes/No)
Feed Compressors	3	No
Feed Compressors Aftercoolers	3	No
Feed Compressors Oil Coolers	3	No
Glycol Circulation Pumps	3	No
CO_2 Removal Vacuum Compressors	6	No
RNG Product Gas Cooler	1	No
N_2 Removal Vacuum Compressors	3	No
N_2 Removal Vacuum Compressors Oil Coolers	3	No
N_2 Removal Recycle Compressors	2	No
N_2 Removal Recycle Compressors Aftercoolers	2	No
N_2 Removal Recycle Compressors Oil Coolers	2	No
Product Gas Cooler from EQ PSA	1	No
Product Compressors	2	No
Product Compressors Aftercoolers	2	No
Thermal Oxidizer	1	No
Thermal Oxidizer Blower	1	No
Thermal Oxidizer Combustion Air Blower	1	No
Off-spec gas Flare	1	No
Off-spec gas Flare Combustion Blower	1	No
Instrument Air Compressors	2	No
Ventilation Fans	6	No
Back Up Generator	1	No
PSA Vessels	1	No
CO_2 Removal Vacuum Oil Coolers	3	No
H2S Removal Vessel	1	No

Figure 2-10
Equipment List

Bowerman Power RNG Plant Project
Orange County, CA



NOTES:
1. FIRE FUEL MODIFICATION AREA TO BE CLEARED AND REPLANTED WITH ORANGE COUNTY FIRE AUTHORITY COMPLIANT VEGETATION.

REV	DATE	DESCRIPTION	DEN BY	DSN BY	CHK BY
0	05/03/24	ISSUED FOR CEQA	MV	-	JF

MONTAUK RENEWABLES
53 3 Campbells Run Road,
Pittsburgh, PA 15205

TENT ENGINEERING
452 NE Greenwood Ave.
Bend, OR 97701
www.tentengr.com

RNG FACILITY DISTURBED AREA

Bowerman RNG Facility
Bowerman Power LFG, LLC
11006 Bee Canyon Access Road,
Irvine, CA 92602

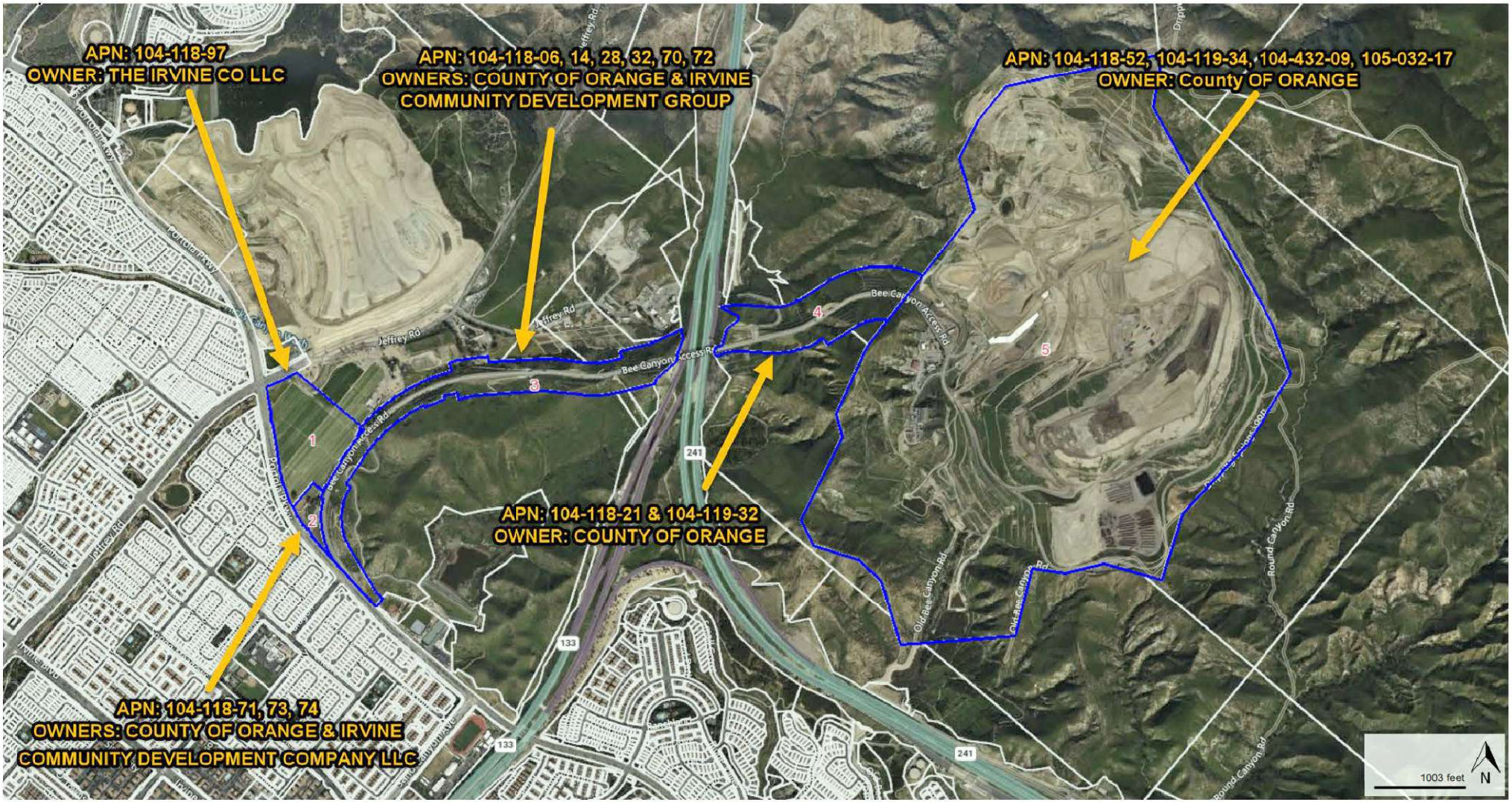
DRAWING NO.
G1.12

PROJECT NO.
164.02

NOT FOR CONSTRUCTION

Figure 2-11
Disturbed Area

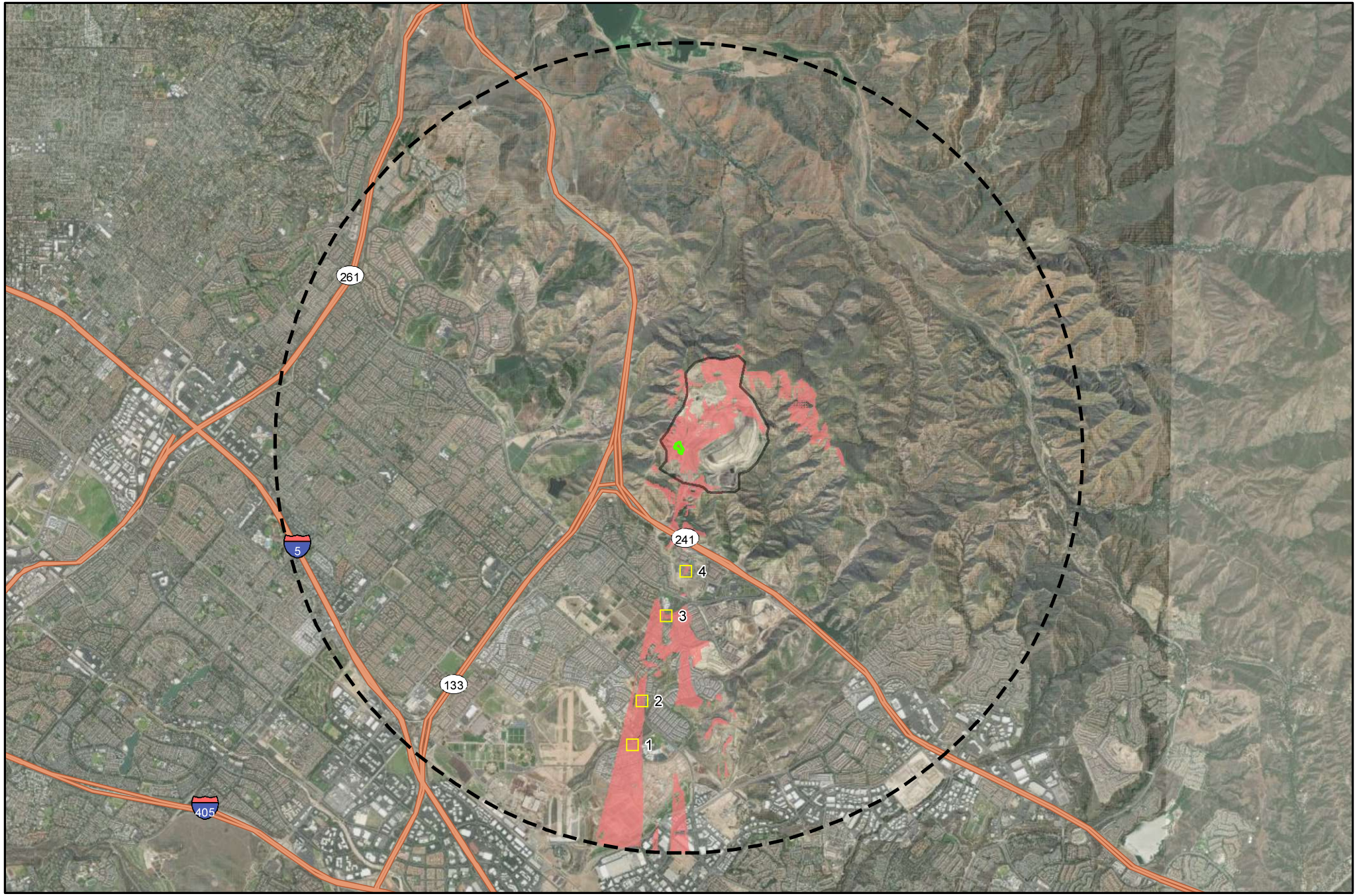
Bowerman Power RNG Plant Project
Orange County, CA



NOT FOR CONSTRUCTION

Figure 2-12
Project Site Parcels

Bowerman Power RNG Plant Project
Orange County, CA



Bowerman Landfill
Project Site
Project Site 4-mile Buffer
Project Potentially Visible
Key Observation Point

NOT FOR CONSTRUCTION

Potential Visibility assumes building height of 55 feet and viewer height of 6 feet.
Analysis incorporated bare earth elevation, with no vegetative screening.

N

0 0.5 1 Miles

Figure 3.4-1
Project Zone of Visual Influence and Key Observation Points

Bowerman RNG Plant Project
Orange County, CA

BOWERMAN POWER RNG PLANT PROJECT

Figure 3.4-2
KOP 1: Cadence

PHOTO SIMULATIONS

VICINITY MAP

LEGEND

- PROPOSED PROJECT LOCATION
- KOP WITH SIMULATION
- BOWERMAN LANDFILL BOUNDARY

PHOTOGRAPH INFORMATION

TIME:	1:12 PM
DATE:	8/11/2023
WEATHER CONDITION:	PARTLY CLOUDY
VIEWING DIRECTION:	NORTHEAST
LATITIUDE:	33.673353°
LONGITUDE:	-117.716923°
DISTANCE FROM PROJECT:	2.9 MILES

DISCLAIMER: PRELIMINARY VISUALIZATIONS ARE FOR REFERENCE ONLY; PROJECT LAYOUT IS IN DEVELOPMENT AND SUBJECT TO CHANGE.

BOWERMAN POWER RNG PLANT PROJECT

Figure 3.4-3
KOP 2: Episode

PHOTO SIMULATIONS

VICINITY MAP

LEGEND

- PROPOSED PROJECT LOCATION
- KOP WITH SIMULATION
- BOWERMAN LANDFILL BOUNDARY

PHOTOGRAPH INFORMATION

TIME:	12:52 PM
DATE:	8/11/2023
WEATHER CONDITION:	PARTLY CLOUDY
VIEWING DIRECTION:	NORTHEAST
LATITIUDE:	33.680717°
LONGITUDE:	-117.717133°
DISTANCE FROM PROJECT:	2.46 MILES

DISCLAIMER: PRELIMINARY VISUALIZATIONS ARE FOR REFERENCE ONLY; PROJECT LAYOUT IS IN DEVELOPMENT AND SUBJECT TO CHANGE.

BOWERMAN POWER RNG PLANT PROJECT

Figure 3.4-4
KOP 3: Portola Overlook Trail
PHOTO SIMULATIONS

VICINITY MAP

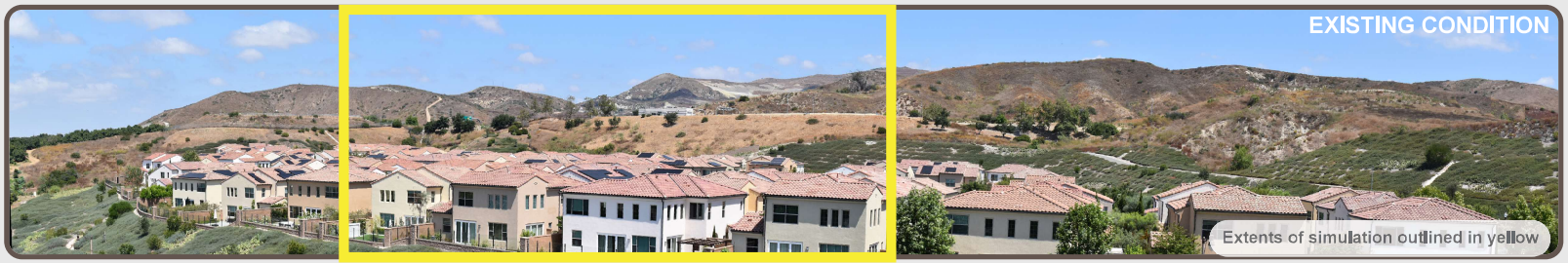
LEGEND

- PROPOSED PROJECT LOCATION
- KOP WITH SIMULATION
- BOWERMAN LANDFILL BOUNDARY

PHOTOGRAPH INFORMATION

TIME:	12:27 PM
DATE:	8/11/2023
WEATHER CONDITION:	PARTLY CLOUDY
VIEWING DIRECTION:	NORTH
LATITIUDE:	33.692200°
LONGITUDE:	-117.711400°
DISTANCE FROM PROJECT:	1.64 MILES

DISCLAIMER: PRELIMINARY VISUALIZATIONS ARE FOR REFERENCE ONLY; PROJECT LAYOUT IS IN DEVELOPMENT AND SUBJECT TO CHANGE.



BOWERMAN POWER RNG PLANT PROJECT

Figure 3.4-5
KOP 4: Tomato Springs

PHOTO SIMULATIONS

VICINITY MAP

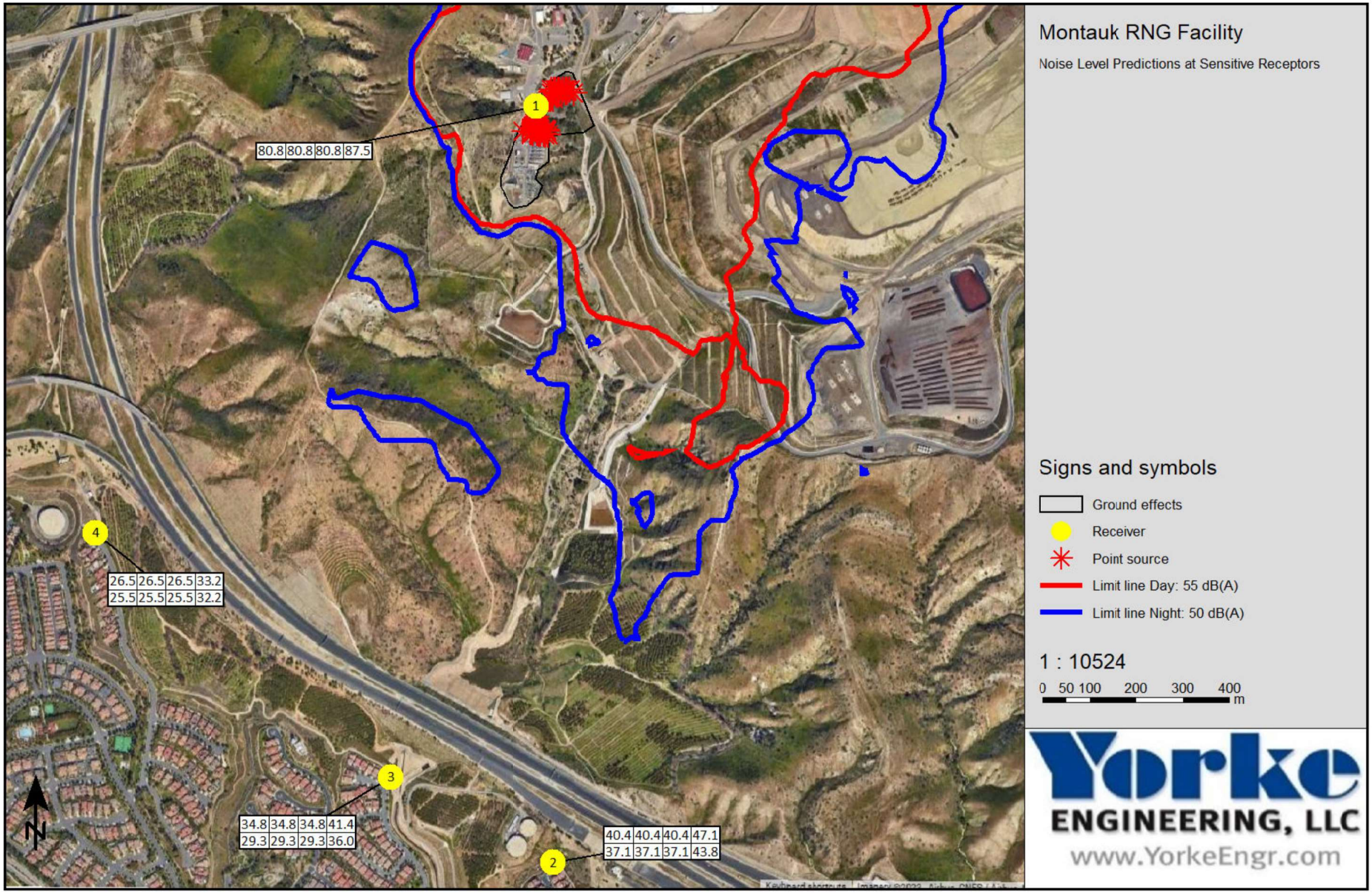
LEGEND

- PROPOSED PROJECT LOCATION
- KOP WITH SIMULATION
- BOWERMAN LANDFILL BOUNDARY

PHOTOGRAPH INFORMATION

TIME:	11:53 AM
DATE:	8/11/2023
WEATHER CONDITION:	PARTLY CLOUDY
VIEWING DIRECTION:	NORTH
LATITIUDE:	33.698850°
LONGITUDE:	-117.708133°
DISTANCE FROM PROJECT:	1.17 MILES

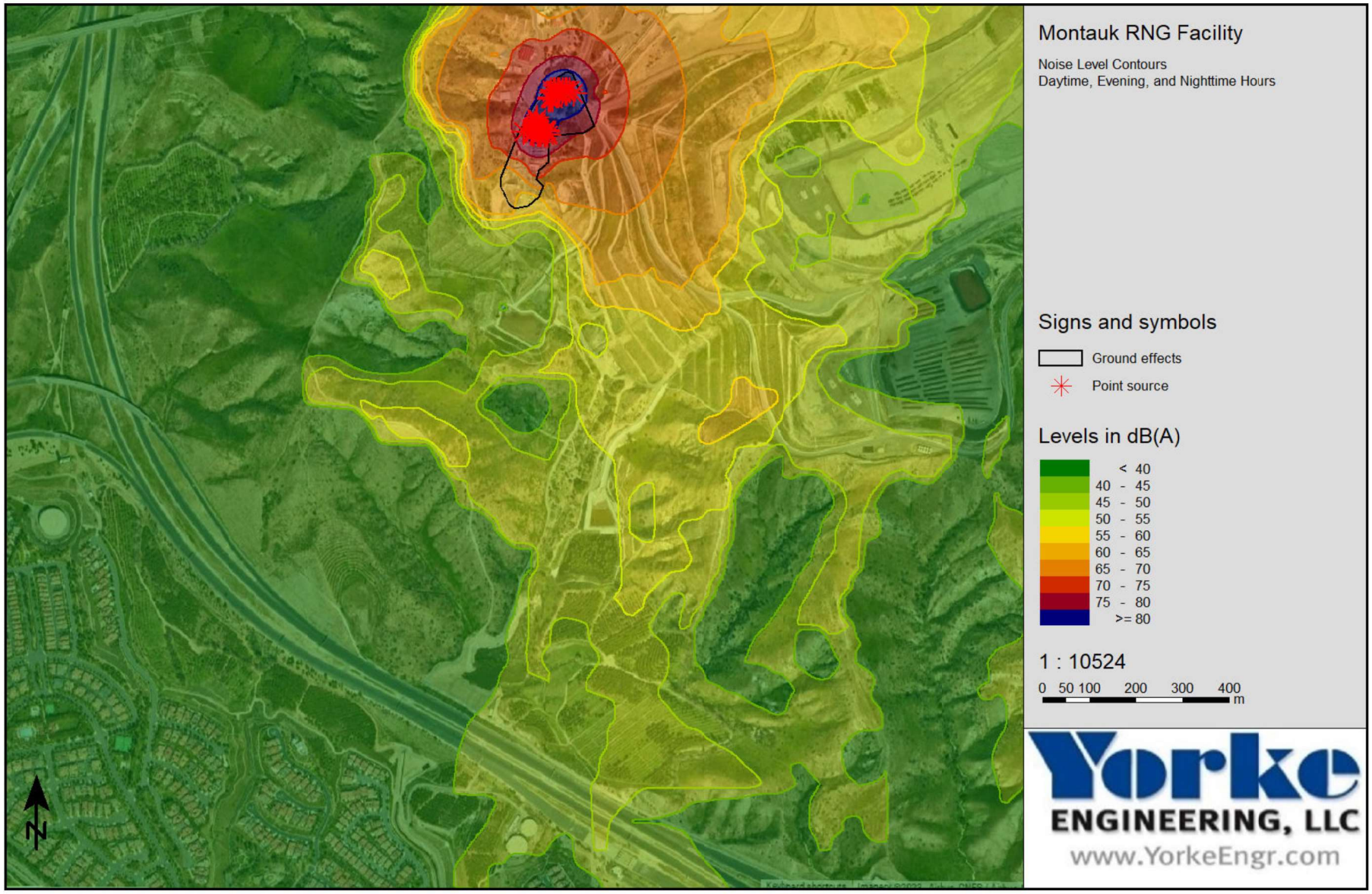
DISCLAIMER: PRELIMINARY VISUALIZATIONS ARE FOR REFERENCE ONLY; PROJECT LAYOUT IS IN DEVELOPMENT AND SUBJECT TO CHANGE.



NOT FOR CONSTRUCTION

Figure 3.4-6
Receptor Locations

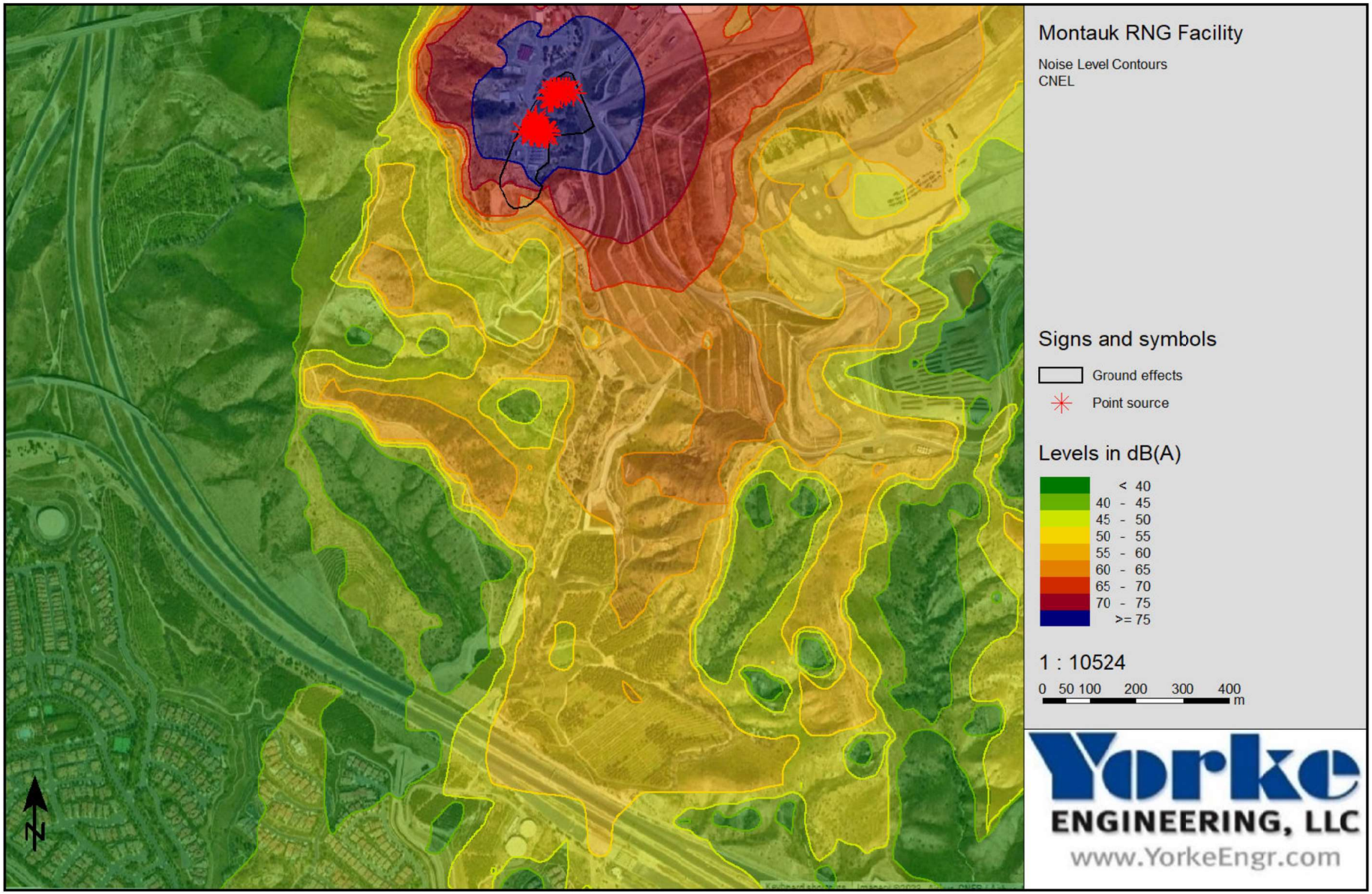
Bowerman Power RNG Plant Project
Orange County, CA



NOT FOR CONSTRUCTION

Figure 3.4-7
Operations Noise Level
Contours (dBA)

Bowerman Power RNG Plant Project
Orange County, CA



NOT FOR CONSTRUCTION

Figure 3.4-8
Operations Noise Level Contours (CNEL)

Bowerman Power RNG Plant Project
Orange County, CA

APPENDIX A: MITIGATION MONITORING AND REPORTING PLAN

OC Waste & Recycling
Bowerman Power Renewable Natural Gas Plant Project

MITIGATION MONITORING AND REPORTING PROGRAM

Prepared For:

OC Waste & Recycling
601 N. Ross Street, 5th Floor
Santa Ana, CA 92701

MITIGATION MONITORING AND REPORTING PROGRAM

Public Resources Code, Section 21081.6 (Assembly Bill 3180) requires that mitigation measures identified in environmental review documents prepared in accordance with California Environmental Quality Act (CEQA) are implemented after a project is approved. Therefore, this Mitigation Monitoring and Reporting Program (MMRP) has been prepared to ensure compliance with the adopted mitigation measures during the Bowerman Power Renewable Natural Gas Plant Project (Project). The OC Waste & Recycling (OCWR) is the agency responsible for assuring the implementation by Bowerman Power LFG, LLC (Bowerman Power) of the mitigation measures identified in the Initial Study/Mitigated Negative Declaration.

This MMRP provides OCWR with a convenient mechanism for quickly reviewing all the mitigation measures including the ability to focus on select information such as timing. The MMRP includes the following information for each mitigation measure:

- The phase of the project during which the required mitigation measure must be implemented;
- The phase of the project during which the required mitigation measure must be monitored; and
- The monitoring agency.

The MMRP includes a checklist to be used during the mitigation monitoring period. The checklist will verify the name of the monitor, the date of the monitoring activity, and any related remarks for each mitigation measure.

MITIGATION MONITORING AND REPORTING PROGRAM							
Permit Name / Regulatory Condition	**Mitigation Measure**	**Implementation Phase**	**Implementation Party**	**Monitoring Phase**	**Monitoring Agency**	**Compliance Verification**	
						Initial	**Date**
NCCP/HCP	**BIO-1:** To address potential Project impacts to intermediate mariposa lily (*Calochortus weedii* var. *intermedius*), an in-lieu fee shall be paid via minor amendment to the NCCP/HCP, as approved by USFWS and CDFW. The in-lieu fee will contribute to a management and monitoring program for rare plants in the Nature Reserve of Orange County. Silt fencing or flagging shall be installed under the guidance of a biological monitor along the limits of coastal sage scrub areas that are immediately outside of the grading/impact limits. The silt fencing/flagging shall be used to minimize impacts to sensitive natural resources including special-status plant species and native plant communities outside and immediately adjacent to the grading limits. Construction activities and personnel will be	Pre-Construction	Bowerman Power	Pre-Construction	OCWR		

MITIGATION MONITORING AND REPORTING PROGRAM

Permit Name / Regulatory Condition	Mitigation Measure	Implementation Phase	Implementation Party	Monitoring Phase	Monitoring Agency	Compliance Verification	
						Initial	Date
	restricted within these adjacent coastal sage scrub areas and a biological monitor will be present during the silt fence/flagging installation and removal.						
Special Status Species	**BIO-2:** Impacts to coastal sage scrub habitat shall occur outside the breeding and nesting season of the coastal California gnatcatcher (February 15 through July 15) to the extent practicable. A pre-construction survey shall be conducted within the Project site to determine the presence/absence of coastal California gnatcatcher and coastal cactus wren prior to clearing or grading activities. The survey shall include a 100-foot buffer around the grading limits. Any coastal California gnatcatcher or coastal cactus wren observations shall be recorded and marked on the construction/grading plans. All coastal sage scrub habitat outside of the Project impact area shall be fenced or marked with flagging materials prior to the commencement of grading. No construction access, parking, or storage of equipment or materials shall be allowed within these areas. A qualified biologist shall conduct and document a pre-construction meeting to educate construction staff (including supervisors, equipment operators, and other site employees) on all mitigation measures required for the Project. A qualified biologist shall monitor the clearing of coastal sage scrub and oak woodland. USFWS/CDFW shall be notified at least 7 calendar days (preferably 14 calendar days) prior to clearing habitat occupied by Target/Identified Species, if observed. The qualified biologist shall ensure that clearing activities and earth-moving equipment do not harm coastal California gnatcatchers or coastal cactus wren. The biologist shall	Pre-Construction, Construction	Bowerman Power	Pre-Construction, Construction	OCWR		

MITIGATION MONITORING AND REPORTING PROGRAM

Permit Name / Regulatory Condition	Mitigation Measure	Implementation Phase	Implementation Party	Monitoring Phase	Monitoring Agency	Compliance Verification	
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	also ensure that these activities do not harm other species that may occur, including western spadefoot, orange-throated whiptail, red-diamond rattlesnake, and coast patch-nosed snake. The access road(s) shall be sprayed with water on occasion to reduce dust accumulation on the leaves of coastal sage scrub species, as overseen by the biological monitor.						
Special Status Species	**BIO-3:** Avoid ground-disturbing and vegetation removal activities during the nesting bird season (February 15 to September 15). If these activities must occur during the nesting season, a pre-construction nesting bird survey shall be conducted by a qualified biologist on and within 300 feet of the Project construction area. The survey shall be conducted no more than 10 days prior to initiation of ground-disturbance, vegetation clearing, or construction activities and repeated between delays of greater than 10 days during the nesting season. If an active nest is found, an appropriate no-disturbance buffer for the species shall be visibly established in the field by a qualified biologist (e.g., flagging, staking, caution tape). No ground-disturbing or vegetation removal activities shall occur within the buffer until the nesting season has ended or the nest is vacated and juveniles have fledged, as determined by the qualified biologist. At the discretion of a qualified biologist, limited encroachment into the buffer may occur for non-listed bird species but no disturbance of active nests or nesting activities is allowed per the Migratory Bird Treaty Act.	Pre-Construction, Construction	Bowerman Power	Pre-Construction, Construction	OCWR		
Archaeological Resources	**CUL -1:** Environmental Training – Prior to construction of the Project, a Secretary of Interior-qualified archaeologist shall be retained by Bowerman Power to serve as the Project Archaeologist. Cultural resource awareness training shall be provided by the Project Archaeologist that	Pre-Construction, Construction	Bowerman Power	Pre-Construction, Construction	OCWR		

MITIGATION MONITORING AND REPORTING PROGRAM							
Permit Name / Regulatory Condition	**Mitigation Measure**	**Implementation Phase**	**Implementation Party**	**Monitoring Phase**	**Monitoring Agency**	**Compliance Verification**	
						Initial	**Date**
	includes all applicable laws and penalties pertaining to disturbing cultural resources, a brief discussion of the prehistoric and historic regional context and archaeological sensitivity of the area, types of cultural resources found in the area, and instruction that Project workers shall halt construction if a cultural resource is inadvertently discovered during construction, and Project personnel contact information in the event of an inadvertent discovery.						
Archaeological Resources	**CUL -2:** Archaeological Monitoring – A qualified Archaeological monitor acceptable to the OCWR shall be retained by Bowerman Power prior to Project-related ground disturbance. The selection of the qualified professional(s) shall be subject to OCWR acceptance based on generally accepted professional qualifications and certifications, as applicable. A qualified Archaeological Monitor shall have at least a BS or BA degree in anthropology, archaeology, historic archaeology, or a related field and previous monitoring experience. The monitors shall conduct on-site daily archaeological monitoring of construction ground disturbance. The Archaeological monitor shall provide daily documentation of construction activity and any findings. The Archaeological monitor shall prepare a daily monitoring log and submit it daily to the Project Archaeologist via email, briefly describing the field conditions, construction progress and activities, non-compliance activities, and record any finds of archaeological material. A final report summarizing the monitoring activities shall be prepared by the Project Archaeologist.	Pre-Construction, Construction	Bowerman Power	Pre-Construction, Construction	OCWR		
Archaeological Resources	**CUL -3:** Monitoring and Inadvertent Discovery Plan – Prior to the start of construction, a Secretary of Interior-qualified Project Archaeologist (retained by Bowerman Power) shall prepare a Monitoring and Inadvertent Discovery Plan (Plan) for the Project. The Plan shall be submitted to OCWR for	Pre-Construction, Construction	Bowerman Power	Pre-Construction, Construction	OCWR		

MITIGATION MONITORING AND REPORTING PROGRAM							
Permit Name / Regulatory Condition	**Mitigation Measure**	**Implementation Phase**	**Implementation Party**	**Monitoring Phase**	**Monitoring Agency**	**Compliance Verification**	
						Initial	**Date**
	review and approval prior to the start of construction. The Plan shall include at a minimum: • Overview of mitigation measures and responsibility for compliance; • Project description of construction activities and maps; • Description of relevant laws and regulations; • Brief cultural context information and types and description of cultural resources that could be inadvertently discovered; • Description of how monitoring shall occur; • The roles and responsibility of the Archaeological Monitor (e.g., authority to halt construction for an inadvertent discovery, daily monitoring, daily reporting, etc.) and Project Archaeologist (e.g., oversee monitors, response to inadvertent discovery, final reporting, etc.); • Description of protocols in the event of an inadvertent discovery (i.e., halt work) and notification procedures and contact list; and • Description of final monitoring report. Stop work protocols shall be implemented in the event of an inadvertent discovery of cultural resources. If a cultural resource is encountered within the new SoCalGas pipeline route, halt work protocols shall include notifying the SoCalGas Project Archaeologist Ryan Glenn or SoCalGas Archaeologist Tricia Dodds and OCWR Environmental Engineering Specialist, Weena Dalby. See contact information below. Cultural resources shall not be relocated without consultation with a SoCalGas Archaeologist.						

MITIGATION MONITORING AND REPORTING PROGRAM

Permit Name / Regulatory Condition	Mitigation Measure	Implementation Phase	Implementation Party	Monitoring Phase	Monitoring Agency	Compliance Verification	
						Initial	Date
Paleontological Resources	**GEO-1:** Worker Education Program. The project proponent shall retain a qualified paleontologist, defined as a paleontologist meeting the Society for Vertebrate Paleontology's Professional Standards (SVP 2010), to carry out all mitigation measures related to paleontological resources. The qualified paleontologist shall conduct the following: a. Prior to the start of any ground disturbing activities, the qualified paleontologist shall conduct a Paleontological Resources Awareness Training program for all construction personnel working on the project site. A Paleontological Resources Awareness Training Guide approved by the qualified paleontologist shall be provided to all personnel. A copy of the Paleontological Resources Awareness Training Guide shall be submitted to the OCWR. The training guide may be presented in video form. b. Paleontological Resources Awareness Training may be conducted in conjunction with other awareness training requirements. c. The training shall include an overview of potential paleontological resources that could be encountered during ground disturbing activities to facilitate worker recognition, avoidance, and subsequent immediate notification to the qualified paleontologist for further evaluation and action, as appropriate; and penalties for unauthorized artifact collecting or intentional disturbance of paleontological resources. d. The project operator shall ensure all new employees who have not participated in earlier Paleontological Resources Sensitivity Trainings shall meet the provisions specified above.	Pre-Construction, Construction	Bowerman Power	Pre-Construction, Construction	OCWR		

MITIGATION MONITORING AND REPORTING PROGRAM

Permit Name / Regulatory Condition	Mitigation Measure	Implementation Phase	Implementation Party	Monitoring Phase	Monitoring Agency	Compliance Verification	
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	e. The Paleontological Resources Awareness Training Guides shall be kept available for all personnel to review and be familiar with as necessary.						
Paleontological Resources	**GEO-2:** Project Monitoring. A qualified paleontologist or designated monitor shall be onsite initially to spot-check excavations below a depth of one foot below the ground surface in areas of undetermined paleontological potential. If it is determined that sediments consist of older alluvium, then full-time paleontological monitoring shall ensue within that area. If sediments are determined to consist of Holocene Quaternary alluvium, paleontological monitoring shall not be required unless an excavation depth of 15 feet below the ground surface is reached in the area. The use of post-driving or rotary drilling shall not require monitoring. a. The duration and timing of monitoring shall be determined by the qualified paleontologist in consultation with OCWR and shall be based on a review of geologic maps and grading plans. b. During the course of monitoring, if the paleontologist can demonstrate based on observations of subsurface conditions that the level of monitoring should be reduced, the paleontologist, in consultation with OCWR, may adjust the level of monitoring to circumstances, as warranted. c. Paleontological monitoring shall include inspection of exposed rock units during active excavations within sensitive geologic sediments. The qualified paleontologist shall have authority to temporarily divert excavation operations away from exposed fossils to collect associated data and recover the fossil specimens if deemed necessary. d. Following the completion of construction, the paleontologist shall prepare a report documenting the	Construction	Bowerman Power	Construction	OCWR		

MITIGATION MONITORING AND REPORTING PROGRAM

Permit Name / Regulatory Condition	Mitigation Measure	Implementation Phase	Implementation Party	Monitoring Phase	Monitoring Agency	Compliance Verification	
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	absence or discovery of fossil resources onsite. If fossils are found, the report shall summarize the results of the inspection program, identify those fossils encountered, recovery and curation efforts, and the methods used in these efforts, as well as describe the fossils collected and their significance. A copy of the report shall be provided to OCWR and to an appropriate repository such as the Natural History Museum of Los Angeles County.						
Paleontological Resources	**GEO-3:** Inadvertent Discoveries of Paleontological Resources — If construction staff or others observe previously unidentified paleontological resources during ground disturbing activities, they shall halt work within a 200-foot radius of the find(s), delineate the area of the find with flagging tape or rope (may also include dirt spoils from the find area), and immediately notify a qualified paleontologist. Construction shall halt within the flagged or roped-off area. The paleontologist shall assess the resource as soon as possible and determine appropriate next steps in coordination with OCWR. Such finds shall be formally recorded and evaluated. The resource shall be protected from further disturbance or looting pending evaluation.	Construction	OCWR	Construction	OCWR		
Tribal Cultural Resources	**TCR – 1:** Should evidence of human remains be discovered during project construction, the Orange County Coroner (OCC) shall be immediately notified of the discovery. Evidence of human remains requires mandatory compliance with the provisions of State Health and Safety Code Section 7050.5, which restricts further disturbance in the vicinity of the discovery, defined herein as a 50-foot radius, until the OCC has made a determination within two business days of the origin and disposition pursuant to Public Resources Code Section 5097.98. If the remains are determined to be Native American, the OCC shall notify the Native American Heritage Commission (NAHC) within 24 hours that remains have been discovered. The NAHC shall	Construction	Bowerman Power	Construction	OCWR		

MITIGATION MONITORING AND REPORTING PROGRAM

Permit Name / Regulatory Condition	Mitigation Measure	Implementation Phase	Implementation Party	Monitoring Phase	Monitoring Agency	Compliance Verification	
						Initial	Date
	determine the identity of the Most Likely Descendant (MLD). The MLD shall complete the inspection of the remains within 48 hours of notification by the NAHC. In addition, per CR-02, SoCalGas Project Archaeologist Ryan Glenn (425) 213-2349 (cell) and RGlenn1@scgcontractor.com or SoCalGas Archaeologist Tricia Dodds (213) 290-7449 (cell) and TDodds@socalgas.com shall be notified of the discovery.						
Tribal Cultural Resources	**TCR – 2:** If unanticipated tribal cultural resources or deposits are discovered during earth-moving activities, the following measures shall be implemented: All work shall halt within a 200-foot radius of the discovery. a qualified professional archaeologist shall assess the significance of the find (if a tribal cultural monitor is not present). If the resources are Native American in origin, the OCWR shall coordinate with the Tribe regarding evaluation, treatment, curation and preservation of these resources. The archaeologist shall have the authority to modify the no-work radius as appropriate, using professional judgment in consultation with OCWR. Work shall not continue within the no-work radius until the archaeologist conducts sufficient research, evidence and data collection to establish that the resource is either: (1) not cultural in origin; or (2) not potentially eligible for listing on the California Register of Historical Resources.	Construction	OCWR	Construction	OCWR		
Tribal Cultural Resources	**TCR – 3:** Tribal Cultural Resource Monitor: Prior to the issuance of any grading permit in which soil would be disturbed, Montauk shall provide evidence in the form of an executed Agreement to OCWR that they have retained a qualified Native American tribal monitor to provide third-party monitoring during excavation and grading activities and to recover and catalogue tribal resources as necessary.	Pre-Construction, Construction	Bowerman Power	Pre-Construction, Construction	OCWR		

MITIGATION MONITORING AND REPORTING PROGRAM							
Permit Name / Regulatory Condition	**Mitigation Measure**	**Implementation Phase**	**Implementation Party**	**Monitoring Phase**	**Monitoring Agency**	**Compliance Verification**	
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	The tribal monitor shall be from or approved by the Kizh Nation. The agreement shall include (i) professional qualifications for the tribal cultural resource monitor(s); (ii) detailed scope of services to be provided including but not limited to pre-construction education, observation, evaluation, protection, salvage, notification, and/or curation requirements, as applicable, with final documentation/monitoring report to OCWR, as applicable; (iii) contact information; (iv) communication protocols between Contractor and Tribal Cultural Resource Monitor; (v) acknowledgment that if the Kizh Nation monitor is not available, Montauk or their contractor as designee may contract with another qualified tribal monitor acceptable to the OCWR. The selection of the qualified professional(s) shall be subject to OCWR acceptance based on generally accepted professional qualifications and certifications, as applicable. The cover sheet of the grading plans shall include a note to identify that third party tribal monitoring is required during excavation and grading activities in accordance the with the OCWR Agreement.						

APPENDIX B: AIR QUALITY, GHG, HRA, AND LST STUDY

Air Quality, GHG, HRA, AQIA, and LST Study for a Renewable Natural Gas Facility in Irvine, CA

Bowerman Power LFG, LLC

11006 Bee Canyon Access Road
Irvine, CA 92602

September 2024

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September 2024

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List of Acronyms and Abbreviations

AB	Assembly Bill
ADMRT	Air Dispersion Modeling and Risk Tool
AERMOD	AMS/EPA Regulatory Model
AMS	American Meteorological Society
AQIA	Air Quality Impact Analysis
AQMP	Air Quality Management Plan
BAAQMD	Bay Area Air Quality Management District
BMP	Best Management Practice
BPIPPRM	Building Profile Input Program for Prime
CAAP	Climate Action and Adaptation Plan
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DPM	Diesel Particulate Matter
FRB	Frank R. Bowerman
GHG	Greenhouse Gas
GLC	Ground-Level Concentration
HAP	Hazardous Air Pollutant
HARP2	Hotspots Analysis and Reporting Program, Version 2
HFC	Hydrofluorocarbon
HIA	Acute Hazard Index
HIC	Chronic Hazard Index
HRA	Health Risk Assessment
HVAC	Heating, Ventilation, and Air Conditioning
ICE	Internal Combustion Engine
LFG	Landfill Gas
LST	Localized Significance Threshold
LTS	Less Than Significant
MEIR	Maximally Exposed Individual Resident
MEIW	Maximally Exposed Individual Worker
MPO	Metropolitan Planning Organization
MT	Metric Ton
N_2O	Nitrous Oxide

NAAQS	National Ambient Air Quality Standards
NED	National Elevation Dataset
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
OCWR	Orange County Waste & Recycling
OEHHA	Office of Environmental Health Hazard Assessment
POR	Point of Receipt
PM_{10}	Particulate Matter Less Than 10 Microns in Size
$PM_{2.5}$	Particulate Matter Less Than 2.5 Microns in Size
ppb	Parts per Billion
ppm	Parts per Million
REL	Reference Exposure Level
RELOOC	Regional Landfill Options for Orange County
RMP	Risk Management Policy
RNG	Renewable Natural Gas
ROG	Reactive Organic Gases
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
scfm	Standard Cubic Feet per Minute
SCS	Sustainable Communities Strategy
SJVAPCD	San Joaquin Valley Air Pollution Control District
SoCalGas	Southern California Gas Company
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
SRA	Source-Receptor Area
TAC	Toxic Air Contaminant
U.S. EPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
$\mu g/m^3$	Micrograms per Cubic Meter
VOC	Volatile Organic Compound

Air Quality, GHG, HRA, AQIA, and LST Study for a Renewable Natural Gas Facility in Irvine, CA

1.0 INTRODUCTION

This technical report includes air quality, greenhouse gas (GHG), health risk assessment (HRA), air quality impact analysis (AQIA), and localized significance threshold (LST) analyses for the construction and operation of a new renewable natural gas (RNG) facility that will be located at an existing landfill in Irvine, CA, which is within the jurisdiction of the County of Orange (the County) and the South Coast Air Quality Management District (SCAQMD).

1.1 Project Description

The Frank R. Bowerman (FRB) Landfill is a state-of-the-art, Class III, municipal solid waste facility owned by the County of Orange and operated and maintained by Orange County Waste & Recycling (OCWR). The FRB Landfill opened in 1990 and is the ninth largest landfill in the United States. The property spans approximately 725 acres of hillside with 534 acres allocated for waste disposal. It is permitted for 11,500 tons per day maximum with an annual average of 8,500 tons per day. The FRB Landfill is currently receiving approximately 8,000 tons of refuse per day. The FRB Landfill has enough projected capacity to serve residents and businesses until approximately 2053. The current permitted capacity is 266 million cubic yards, of which approximately 105.7 million cubic yards have been placed as of June 2022.

The Regional Landfill Options for Orange County (RELOOC) defines the permitted vertical and horizontal expansions for the Master Development Plan of the FRB Landfill (County of Orange 2006). The permitted vertical and horizontal expansions are implemented in phases to provide for sufficient landfill operation areas and not disturb all parts of the landfill at once. The Master Development Plan includes three Phase VIII subareas (VIII A, B, and C). The FRB Master Development Plan also includes several on-site stockpile locations for soil excavated as part of landfill phase development and operations. All soil stockpiles are within the landfill property. The soil is used for daily and intermediate cover, liner, road construction, and other related uses. Excavations are currently underway for the development of Phase VIIIA1. Soils excavated from the development of Phase VIIIA1 are stockpiled in the soil stockpile area.

The landfill gas (LFG) currently natively created is managed via a gas collection and control system, which includes vertical and horizontal gas extraction wells, a collection pipe system, and a flare station complex comprised of six flares. The Bowerman Power Plant, an existing 19.6-megawatt LFG-to-energy facility, was opened in 2016 and is an award-winning, public-private partnership producing enough electricity for the City of Anaheim to power 26,000 homes. Bowerman Power currently owns and operates the Bowerman Power Plant. It is located adjacent to the flare station and processes approximately 8,350 standard cubic feet per minute (scfm) of raw LFG to remove moisture and contaminants. The LFG not processed by the Bowerman Power Plant is incinerated at the flaring station.

Bowerman Power is working with OCWR to develop an RNG Plant at the FRB Landfill. The RNG Plant will be designed to process a portion of the excess LFG that has not been processed at

the Bowerman Power Plant and would otherwise require incineration at the existing adjacent flare station and then deliver the processed RNG to Southern California Gas Company (SoCalGas) via a pipeline. The RNG Plant layout will be comprised of two areas: the process equipment area and the control and electrical buildings.

The RNG Plant will be designed to process a maximum of 6,000 scfm of raw LFG at the inlet. The process will remove moisture, nitrogen, oxygen, carbon dioxide, hydrogen sulfide, volatile organic chemicals, hydrogen sulfide, and other minor impurities to meet the gas specifications of SoCalGas.

Excavation is currently underway for the development of FRB Landfill Phase VIIIA1. The soils removed during the excavation are stockpiled within the FRB Landfill's boundaries. The RNG Plant pad is expected to require approximately 70,000 cubic yards of fill material. This fill material will be extracted from within the soil stockpile area and trucked to the RNG Plant site for development of the RNG Plant foundation pad.

SoCalGas will develop a point of receipt (POR) facility that will receive RNG from the plant, odorize it, compress it, and insert the RNG into its pipeline. A 250-gallon odorant tank will be installed in the POR facility. SoCalGas will construct a new 12-inch diameter pipeline to convey the RNG from the POR on the Project site to the existing SoCalGas pipeline at the corner of Portola Parkway and Jeffrey Road, in the City of Irvine. The new SoCal Gas pipeline will be approximately 2.0 miles in length along Bee Canyon Access Road and approximately 0.4 miles in length along Portola Parkway, for a total of 2.4 miles.

The proposed RNG systems are intended to support continuous operation with appropriate equipment and components. To support minimal staffing, the RNG Plant will be automated to allow station operations. Under normal conditions, maintenance personnel will be on-site for site inspections and maintenance only as needed, and typically only during daylight hours.

The RNG Plant will be supplied with LFG from the existing flare station for processing into pipeline quality gas. The RNG Plant will be designed to produce RNG that meets the Product Gas Composition requirements as set forth pursuant to SoCalGas's Rule Number 30 requirements.

The RNG Plant will have two buildings: an electrical building, which is planned to be unoccupied, and a Control Building, which will be occupied by the operational staff. The process equipment will be placed outside on the RNG Plant pad. The Control Building will house the Control Center (computer stations) and lavatories, and the Electric Building will house the electrical room.

The POR facility will be 8,000 square feet and include an electrical shelter, analyzer shelter, automated control valve(s), filter separator, meter, odorant skid, aboveground piping and pipe supports, bollards, fencing, roadways, and gates.

Normal operational power will be provided by Southern California Edison (SCE) service. In case of SCE power outage, a natural gas emergency generator will be on-site to power critical facility safety and control systems. The generator will be used for temporary backup power only.

1.2 Process Description

The RNG Plant will consist of four main processes:

- A Landfill Gas Treatment System (LFGTS) comprised of subsystems to compress the influent LFG; remove particles, water, Volatile Organic Compounds (VOC), siloxanes, Hydrogen Sulfide (H_2S), Carbon Dioxide (CO_2), Oxygen (O_2), and Nitrogen (N_2); and

process the resulting gas by dehydration and compression; all to meet SoCalGas sales gas specifications. The LFGTS does not have its own direct emissions to atmosphere.

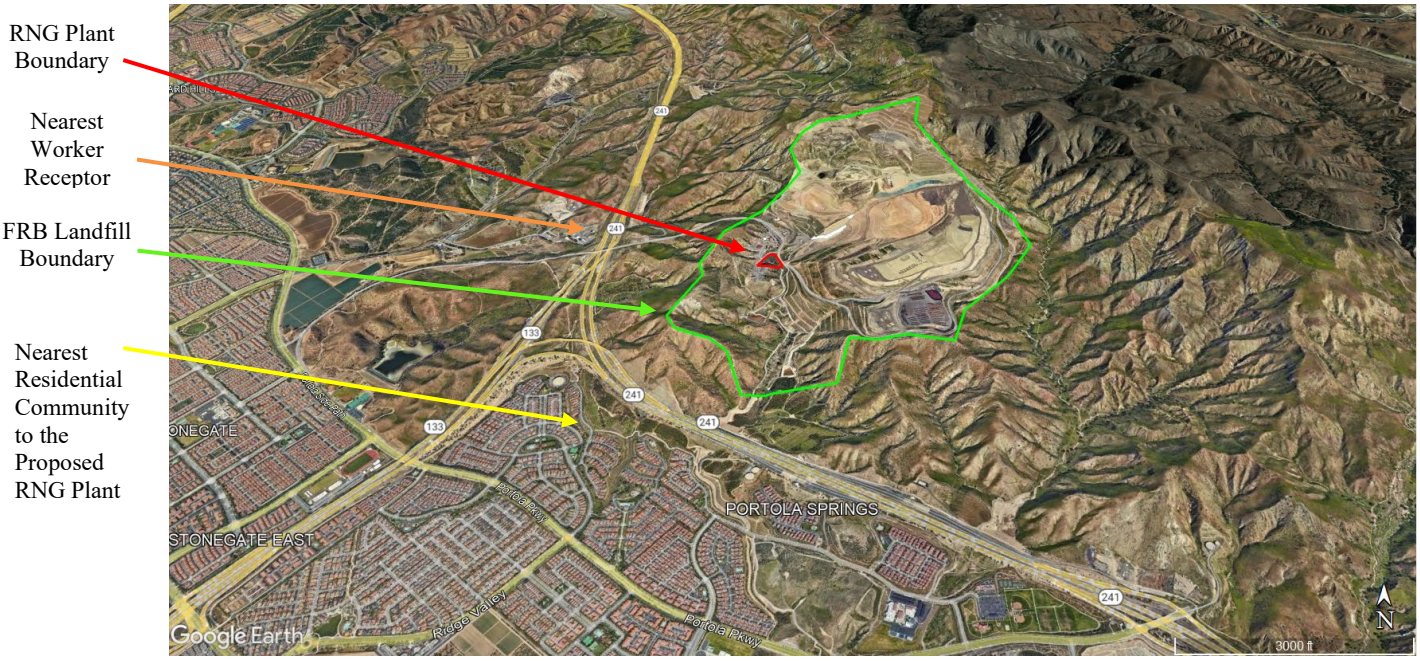
- A 32.9 Million British Thermal Units (MMBTU)/hr (at High Heating Value or HHV) Low-Nitrogen Oxides (NOx) thermal oxidizer, also referred to herein as a Thermal Oxidizer Unit (TOU), to continuously destroy streams of low-BTU tail gases that are produced from LFGTS; with up to 280 scfm natural gas as supplemental fuel.
- A 120.0 MMBTU/hr flare to destroy off-specification (off-spec) product and process gases, as well as gases vented during initial and periodic start-up operations and plant depressurization associated with shutdown operations; with a 0.10 MMBTU/hr pilot, fueled by natural gas, and operating continuously to allow for intermittent lower and higher heating value streams to be routed to the flare for disposal.
- A Caterpillar DG 150 generator set, driven by a 253 horsepower (hp) natural gas-fueled emergency Internal Combustion Engine (ICE), to provide backup power when grid power is unavailable.

1.3 Facility Location

The proposed site is located at 11006 Bee Canyon Access Road in Irvine, CA, which is within the jurisdiction of the County of Orange (the County). The facility is located in the unincorporated General Agricultural, Citrus Rural District (A1) zone. The nearest residential receptors are homes located in the City of Irvine, Portola Springs neighborhood, generally south of the Project site, on the south side of State Route (SR) 241 and east of SR 133. The nearest worker receptor is located at Jimni Systems Inc., located west of State Route 133.

Figure 1-1 is satellite imagery showing the location of the proposed facility, the surrounding area, highways, and the nearest receptors.

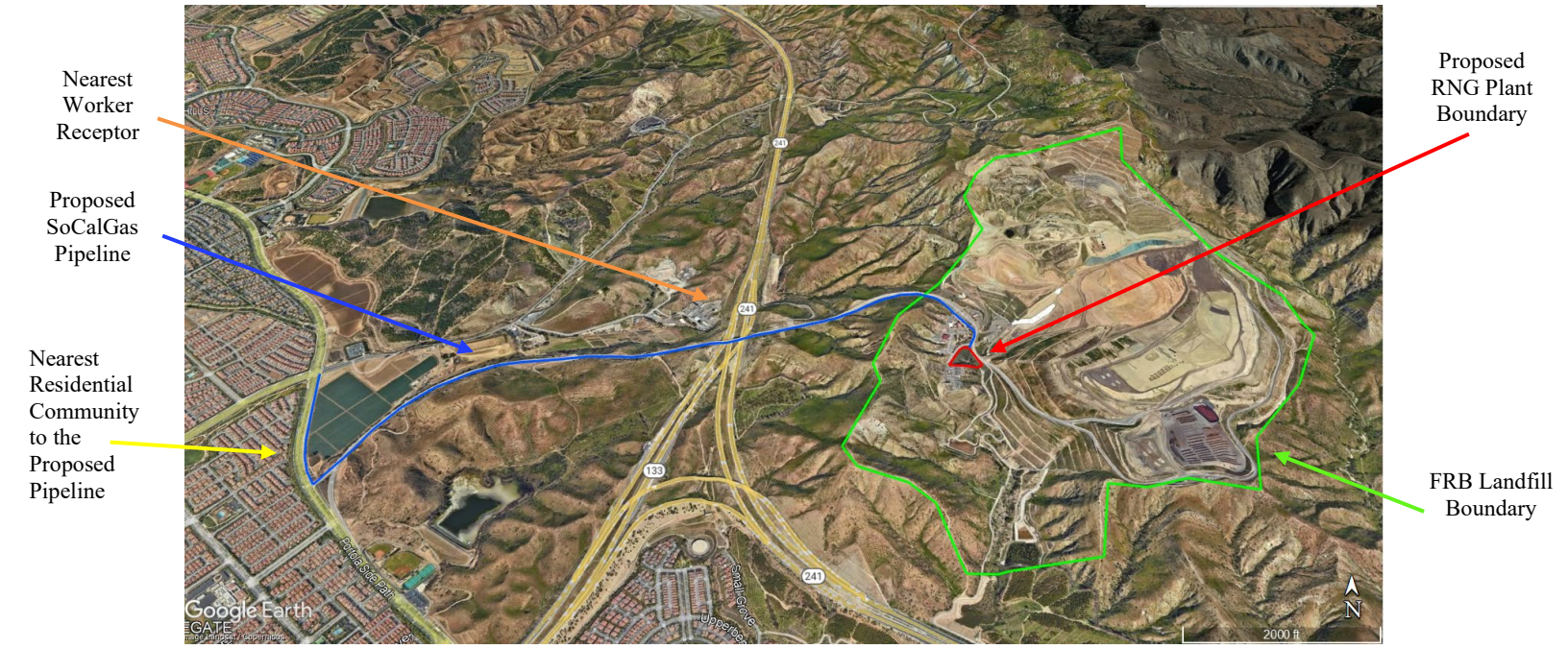
Figure 1-1: Proposed RNG Plant Location Diagram



The new SoCalGas pipeline will run from the point of interconnect within RNG Plant boundary, down Bee Canyon Access Road to the existing SoCal Gas pipeline on the corner of Portola Parkway and Jeffery Road, as shown in Figure 1-2. The new SoCal Gas pipeline will be approximately 2.0 miles in length along Bee Canyon Access Road and approximately 0.4 miles in length along Portola Parkway, for a total of 2.4 miles.

The Project will be located in unincorporated Orange County within the sphere of influence of the City of Irvine, except for a small portion of the new SoCal Gas pipeline, which will be located within the City of Irvine.

Figure 1-2: Proposed SoCalGas Location Diagram



2.0 ASSUMPTIONS

The following sources of information were used in developing the emissions estimates for the proposed Project using the California Emissions Estimator Model® (CalEEMod). CalEEMod default settings that have a particularly important impact on the Project are listed below.

- The Applicant defined:
  - Basic Project design features, including size of building features, parking spaces, number of units, landscaping, etc.;
  - Low VOC paints will be used in compliance with SCAQMD rules;
  - During construction, any exposed soil and unpaved access roads will be watered a minimum of three times a day, as required by the SCAQMD;
  - Paved roads outside access points to the parcel will be swept daily during the construction, site preparation, and grading phases to control track-out; and
  - The Control Building will meet the 2022 Title 24 Building Envelope Energy Efficiency Standards; and

- CalEEMod defaults were used for:
  - Construction equipment load factors;
  - Fleet average age;
  - Architectural coating areas; and
  - Average vehicle trip distances.

3.0 AIR QUALITY AND GREENHOUSE GAS IMPACTS ANALYSES

In order to evaluate the potential for air quality and GHG impacts from a proposed project, quantitative significance criteria established by the local air quality agency, such as the SCAQMD, may be relied upon to make significance determinations based on mass emissions of criteria pollutants and GHGs, as presented in this report. As shown below, approval of the Project would not result in any significant effects relating to air quality or GHGs.

3.1 CEQA Thresholds of Significance

3.1.1 Criteria Pollutants, Toxic Air Contaminants, and Odors

The Air Quality section of Appendix G of the CEQA Guidelines (Environmental Checklist Form) contains four air quality significance criteria. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

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

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?

The SCAQMD air quality significance thresholds for construction and operation to evaluate local and regional impacts are presented in Table 3-1.

3.1.2 Greenhouse Gases

The Greenhouse Gas Emissions section of Appendix G of the CEQA Guidelines contains two GHG significance criteria. 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?

The SCAQMD CEQA threshold of significance for GHGs for industrial facilities is 10,000 MT per year CO_2e (Table 3-1). This threshold accounts for operational emissions as well

as emissions generated during construction amortized over a 30-year projected project lifetime.

Table 3-1: SCAQMD CEQA Thresholds of Significance

Pollutant	Project Construction (lbs/day)	Project Operation (lbs/day)
ROG (VOC)	75	55
NO_x	100	55
CO	550	550
SO_x	150	150
PM_{10}	150	150
$PM_{2.5}$	55	55
24-hour $PM_{2.5}$ Increment	10.4 µg/m^3	2.5 µg/m^3
24-hour PM_{10} Increment	10.4 µg/m^3	2.5 µg/m^3
Annual PM_{10} Increment	1.0 µg/m^3 annual average	
1-hour NO_2 Increment	0.18 ppm (state)	
Annual NO_2 Increment	0.03 ppm (state) & 0.0534 ppm (federal)	
1-hour SO_2 Increment	0.25 ppm (state) and 0.075 ppm (federal – 99th percentile)	
24-hour SO_2 Increment	0.04 ppm (state)	
24-hour Sulfate Increment	25 µg/m^3 (state)	
1-hour CO Increment	20 ppm (state) and 35 ppm (federal)	
8-hour CO Increment	9.0 ppm (state/federal)	
Toxic Air Contaminants (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥10 in one million	
	Cancer Burden >0.5 excess cancer cases (in areas ≥1 in one million)	
	Chronic and Acute Hazard Index ≥1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to Rule 402	
GHGs	10,000 MT/yr CO_2e for industrial facilities	
	3,000 MT/yr CO_2e for land use projects (draft proposal)	

Source: SCAQMD 2023, 2008b.

3.2 Project Emissions Estimation

The land use construction and operation analyses were performed using CalEEMod version 2022.1.1.28, the official statewide land use computer model designed to provide a uniform platform for estimating potential criteria pollutant and GHG emissions associated with both construction and operations of land use projects under the California Environmental Quality Act (CEQA). The model quantifies direct emissions from construction and operations (including vehicle use), as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. The mobile source emission factors used in the model – published by the California Air Resources Board (CARB) – include the Pavley standards and Low Carbon Fuel standards. The model also identifies Project design features, regulatory measures, and control measures to reduce criteria pollutant and GHG emissions along with calculating the benefits achieved from the selected measures. CalEEMod was developed by the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the SCAQMD, the Bay Area Air Quality Management District (BAAQMD), the San Joaquin Valley Air Pollution Control District (SJVAPCD), and other California air districts. Default land use data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) were provided by the

various California air districts to account for local requirements and conditions. As the official assessment methodology for land use projects in California, CalEEMod is relied upon herein for construction and land use operational (i.e., mobile, energy and water use, etc.) emissions quantification, which forms the basis for the impact analysis.

The stationary equipment that would contribute to the emissions of criteria pollutants, TACs, and GHGs during the operational phase are described in Section 1.2 and include:

- The thermal oxidizer;
- The off-spec flare pilot (the rationale for excluding gas disposed in the flare is described in Section 3.2.2); and
- The generator set ICE.

Emissions from combustion for each of these sources were calculated separately and entered into CalEEMod under the "User Defined" category. These emissions are summarized in Sections 3.5 and 4.3, Tables 3-10, and 4-7 to 4-10. Detailed emission calculations are included Appendix D.

3.2.1 Construction

Based on information received from the Applicant, representative land use data for the proposed Project activities that were used for CalEEMod input are presented in Table 3-2.

Table 3-2: Land Use, RNG Plant, and SoCalGas Pipeline Data for CalEEMod Input

Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage (footprint)	Square Feet	Description
Commercial	General Office Building	2.670	1,000 sq. ft.	0.061	2,670	Control Building on site
Industrial	General Heavy Industry	22.045	1,000 sq. ft.	0.51	22,045	Site of Renewable Gas Facility
Parking	Other Asphalt Surfaces	23.240	1,000 sq. ft.	0.53	23,240	Parking Areas (Concrete hardscape and asphalt paving)
Parking	Other Non-Asphalt Surfaces	136.840	1,000 sq. ft.	3.14	136,840	Graded Non-Asphalt Areas
Linear	User Defined Linear	2.40	Mile	–	–	SoCalGas Pipeline
			Project Size	**4.24**	**184,800**	

Sources: Applicant 2023, CalEEMod version 2022.1.1.28.

Notes:

Electric utility: Southern California Edison.

Gas utility: Southern California Gas Company.

The Project is expected to require up to approximately 1.5 years of planned work activities (i.e., from mobilization to substantial completion) comprising six construction phases:

1. Site preparation;
2. Grading;
3. Building construction;
4. Paving;
5. Architectural coating; and
6. Trenching and pipeline construction.

Table 3-3: Proposed Project Preliminary Construction Schedule by Phase

Phase #	Phase Name	CalEEMod Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase
1	Earthworks A	Site Preparation	2/12/2025	2/26/2025	5	11
2	Earthworks B	Grading	2/27/2025	5/6/2025	5	49
3	Building Construction A	Building Construction	5/7/2025	12/19/2025	5	163
	Building Construction B		12/23/2025	1/6/2026	5	11
	Building Construction C		1/7/2026	3/4/2026	5	41
4	Paving	Paving	3/5/2026	3/19/2026	5	11
5	Architectural Coating	Architectural Coating	3/20/2026	4/9/2026	5	16
6	SoCalGas Pipeline Construction	Linear, Drainage, Utilities, & Sub-Grade	4/1/2025	7/1/2026	5	327

Table 3-4: Proposed Project Offroad Equipment Used for Construction Phases for CalEEMod Input

Phase #	Phase Name	Equipment Description	Fuel Type	Engine Tier	Qty	Hours/ Day	hp	Load Factor
1	Site Preparation	Rubber Tired Dozers	Diesel	Average	3	8	367	0.4
		Tractors/Loaders/Backhoes	Diesel	Average	4	8	84	0.37
2	Grading	Rubber Tired Dozers	Diesel	Average	2	6	148	0.41
		Tractors/Loaders/Backhoes	Diesel	Average	2	6	84	0.37
		Cement and Mortar Mixers	Diesel	Average	1	6	367	0.4
		Sweepers/Scrubbers	Diesel	Average	1	6	36	0.46
		Dumpers/Tenders	Diesel	Average	10	6	16	0.38
		Off-Highway Trucks	Diesel	Average	1	6	376	0.38
		Excavators	Diesel	Average	1	8	36	0.38
3	Building Construction	Cranes	Diesel	Average	2	6	367	0.29
		Forklifts	Diesel	Average	3	8	82	0.2
		Tractors/Loaders/Backhoes	Diesel	Average	1	6	14	0.74
		Aerial Lifts	Diesel	Average	1	6	84	0.37
		Off-Highway Trucks	Diesel	Average	1	6	46	0.45
4	Paving	Tractors/Loaders/Backhoes	Diesel	Average	1	8	84	0.37
		Pavers	Diesel	Average	1	8	81	0.42
		Paving Equipment	Diesel	Average	2	6	89	0.36
		Rollers	Diesel	Average	2	6	36	0.38
		Cement and Mortar Mixers	Diesel	Average	2	6	10	0.56
5	Architectural Coating	Air Compressors	Diesel	Average	1	6	37	0.48
6	Trenching and Pipeline Construction	Bore/Drill rigs	Diesel	Average	1	6	83	0.5
		Excavators	Diesel	Average	1	6	36	0.38
		Rubber Tired Dozers	Diesel	Average	1	6	367	0.4
		Tractors/Loaders/Backhoes	Diesel	Average	1	6	84	0.37
		Cranes	Diesel	Average	1	6	367	0.29
		Graders	Diesel	Average	1	6	148	0.41
		Other General Industrial Equipment	Diesel	Average	1	6	35	0.34
		Air Compressors	Diesel	Average	1	6	37	0.48
		Other Construction Equipment	Diesel	Average	1	6	82	0.42

The CalEEMod default distances of 18.5 miles and 10.2 miles were used for the worker and vendor trips, respectively. The CalEEMod default distance of 20 miles was used for the hauling trips Table 3-5 summarizes the construction trip rates and mileages

Table 3-5: Proposed Project Construction Traffic Summary

Phase #	Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
1	Earthworks A	Worker	17.5	18.5	LDA,LDT1,LDT2
2	Earthworks B	Hauling	178.6	20.0	HHDT
		Worker	45.0	18.5	LDA,LDT1,LDT2
3	Building Construction A	Worker	10.1	18.5	LDA,LDT1,LDT2
		Vendor	4.1	10.2	HHDT,MHDT
4	Building Construction B	Worker	10.1	18.5	LDA,LDT1,LDT2
		Vendor	4.1	10.2	HHDT,MHDT
5	Building Construction C	Worker	10.1	18.5	LDA,LDT1,LDT2
		Vendor	4.1	10.2	HHDT,MHDT
6	Paving	Worker	20.0	18.5	LDA,LDT1,LDT2
7	Architectural Coating	Worker	6.1	18.5	LDA,LDT1,LDT2
8	SoCalGas Pipeline Construction	Hauling	0.4	20.0	HHDT
		Onsite truck	2.0	20.0	HHDT
		Worker	22.5	18.5	LDA,LDT1,LDT2

Key: LDA = Light-Duty Automobile; LDT = Light-Duty Truck; MHDT = Medium-Heavy-Duty Truck; HHDT = Heavy-Heavy-Duty Truck

3.2.2 Operation

The term "project operations" refers to the full range of activities that can or may generate criteria pollutant, GHG, and TAC emissions when the project is functioning in its intended use. CalEEMod estimates emissions from the following sources:

- "Mobile" sources, which include emissions from onroad vehicles required to operate the proposed Project;
- "Area" sources, which include emissions from consumer products, architectural coatings, and landscaping equipment;
- "Energy" Sources, which include emissions from building electricity and natural gas usage (non-hearth);
- "Water and Wastewater", which includes the GHG emissions associated with supplying and treating water and wastewater used and generated by the project land uses;
- "Waste", which includes the GHG emissions at landfills associated with disposal of solid waste generated for each project land use subtype; and
- "Refrigerants", which includes the fugitive GHG emissions associated with building air conditioning (A/C) and refrigeration equipment.

Emissions from the abovementioned sources are collectively referred to as "miscellaneous operational sources" in this document.

For industrial projects and some commercial projects, equipment operation and manufacturing processes, i.e., permitted stationary sources, can be of greatest concern from an emissions standpoint. For this Project, the stationary sources of combustion byproducts,

criteria pollutants, and GHGs are the RNG thermal oxidizer, RNG flare, and emergency generator.

This report evaluates only the calculated incremental operational emissions increases from the stationary sources, which include the combustion of pilot fuel (natural gas) and tail gas in the RNG thermal oxidizer, the combustion of pilot fuel (natural gas) in the RNG flare, as well as the combustion of natural gas in the emergency generator. Combustion of gas sent to the RNG flare for disposal during transient conditions, e.g., equipment start-up, is excluded from the evaluation since this is analogous to disposal in the flare station at the FRB Landfill and does not represent a new source of emissions. Emissions from combustion for each of these sources were calculated separately and entered into CalEEMod under the "User Defined" category. Further details regarding the source dimensions, specifications, and a process flow diagram of the project are presented in Appendix B.

Regional CEQA Significance of Criteria Pollutants

3.2.3 Construction

A project's construction phase produces many types of emissions, and generally, particulate matter less than 10 microns in size (PM_{10}) [including particulate matter less than 2.5 microns in size ($PM_{2.5}$)] in fugitive dust and diesel engine exhaust are the pollutants of greatest concern. Construction-related emissions can cause substantial increases in localized concentrations of PM_{10}, as well as affecting PM_{10} compliance with ambient air quality standards on a regional basis. The use of diesel-powered construction equipment emits ozone precursors NO_x and reactive organic gases (ROG), as well as diesel particulate matter (DPM); however, the use of diesel-powered equipment would be minimal. Use of architectural coatings and other materials associated with finishing buildings may also emit ROG and toxic air contaminants (TACs). CEQA significance thresholds address the impacts of construction activity emissions on local and regional air quality. Thresholds are also provided for other potential impacts related to Project construction, such as odors and TACs.

The SCAQMD's approach to CEQA analyses of fugitive dust impacts is to require implementation of effective and comprehensive dust control measures rather than to require detailed quantification of emissions. PM_{10} emitted during construction can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions, and other factors, making quantification difficult. Despite this variability in emissions, experience has shown that there are several feasible control measures that can be reasonably implemented to significantly reduce fugitive dust emissions from construction. For larger projects, the SCAQMD has determined that compliance with an approved fugitive dust control plan comprising Best Management Practices (BMPs), primarily through frequent water application, constitutes sufficient control to reduce PM_{10} impacts to a level considered less than significant.

CalEEMod outputs are in Appendix A. It should be noted that although emissions are labeled as "mitigated" in the CalEEMod outputs, these emissions reflect project design features, i.e., required BMPs. For this project, applicable SCAQMD and Planning

Department approved BMPs will be implemented as project design features. This is a standard Condition of Approval and pursuant to CEQA, is not considered mitigation.

Table 3-6 shows the proposed Project's criteria pollutants emissions for construction and evaluates them against SCAQMD significance thresholds.

As shown in Table 3-6, mass emissions of criteria pollutants from construction would be below applicable SCAQMD significance thresholds.

PROJECTED IMPACT: Less Than Significant (LTS)

Table 3-6: Construction Emissions Summary and Significance Evaluation

Criteria Pollutants	Construction Emissions (lbs/day)	Threshold (lbs/day)	Significance
ROG (VOC)	11.1	75	LTS
NO_x	56.8	100	LTS
CO	50.0	550	LTS
SO_x	0.16	150	LTS
Total PM_{10}	24.9	150	LTS
Total $PM_{2.5}$	6.5	55	LTS

Sources: SCAQMD 2023, CalEEMod version 2022.1.1.28.

Notes:

lbs/day are winter or summer maxima for planned land use.

Total PM_{10}/$PM_{2.5}$ comprises fugitive dust plus engine exhaust.

3.2.4 Operation

Table 3-7 shows baseline and the proposed Project's criteria pollutants emissions for operations and evaluates the proposed Project's emissions against SCAQMD significance thresholds.

As previously stated, the RNG Plant is designed to process a maximum of 6,000 scfm of raw LFG at the inlet. As such, the Project's baseline is defined as the emissions from disposal of 6,000 scfm of raw LFG in the flare station at the FRB Landfill. These emissions are estimated from the emission factors in the SCAQMD Permit to Construct for Flare I-6, the newest flare at the flare station. This allows for a conservative comparison of emissions from the RNG Plant with baseline emissions, is subject to lower emission standards than the other flares in the flare station at the FRB Landfill.

The operational emissions only include the calculated incremental operational emissions increases from Miscellaneous Operational Sources (i.e., mobile, area, energy sources) as well as the stationary sources (i.e., pilot fuel (natural gas) and tail gas for the thermal oxidizer, pilot fuel for the flare, as well as natural gas for emergency generator usage). The difference ([G]) between the proposed Project ([F]) and baseline emissions ([A]) represent the incremental change in emissions, and these incremental changes are compared to the SCAQMD CEQA significance thresholds ([H]). These emissions represent the peak operating day with the TOU, Flare, and Emergency Engine operating on the same day. This is a conservative estimate because a normal operating day would not involve emergency engine usage, which is limited to maintenance and testing hours only.

As shown in Table 3-7, mass emissions of criteria pollutants from operation are below applicable SCAQMD CEQA significance thresholds. The proposed Project would provide a beneficial use for the LFG generated from the landfill and therefore, would have a less than significant impact.

PROJECTED IMPACT: Less Than Significant (LTS)

Table 3-7: Operational Emissions Summary and Significance Evaluation

Emission Source		Criteria Pollutant Emissions on Peak Operating Day [8] (lb/day)					
		VOC	NO_x	CO	SO_x[9]	PM_{10}[10]	$PM_{2.5}$[10]
[A]	Baseline Existing LFG Flare Emissions [1] (6,000 scfm LFG)	25.92	108.00	259.20	124.01	52.70	52.70
[B]	Proposed TOU[2]	4.34	25.29	57.81	124.26	5.16	5.16
[C]	Proposed Flare[3]	0.01	0.14	0.14	0.00	0.01	0.01
[D]	Proposed Engine[4]	0.11	0.70	1.17	0.00	0.07	0.07
[E]	Proposed Miscellaneous Operational Sources[5]	0.75	0.32	1.59	0.00	0.12	0.05
[F] = [B + C + D + E]	**Proposed Project[6]**	**5.22**	**26.46**	**60.72**	**124.27**	**5.37**	**5.29**
[G] = [F] - [A]	**Proposed Project - Baseline Existing LFG Flare Emissions**	**-20.70**	**-81.54**	**-198.48**	**0.25**	**-47.34**	**-47.34**
[H]	SCAQMD Mass Daily Thresholds for Operation [7]	55	55	550	150	150	150
[G] > [H]	Significance	LTS	LTS	LTS	LTS	LTS	LTS

[1] Baseline is calculated as the emissions from flaring 6,000 scfm LFG (~180 mmBtu/hr) for 24 hours at the Flare I-6 emission factors.
[2] Proposed TOU: 2,315 scfm Tail Gas 1 (~6.4 mmBtu/hr) + 885 scfm Tail Gas 2 (~6.1 mmBtu/hr) + 280 scfm Supplemental Fuel (~17.6 mmBtu/hr), 24 hours. Note: RNG Plant inlet compression removes approximately 400 scfm moisture from the incoming LFG. The RNG Plant is projected to generate on the order of 2,400 scfm RNG. Tail Gas 1 + Tail Gas 2 + RNG = 2,315 scfm + 885 scfm + 2,400 scfm = 5,600 scfm. RNG Plant Inlet – Moisture Removal = 6,000 scfm – 400 scfm = 5,600 scfm. Further information regarding tail gas compositions and fuel heat ratings are provided in Appendices B and C.
[3] Proposed Flare: ~1.6 scfm Supplemental Fuel (0.1 mmBtu/hr), 24 hours.
[4] Proposed Engine: Engine is natural gas fired and used for maintenance and testing.
[5] Proposed Miscellaneous Operational Sources: Includes Mobile, Area, and Energy sources from CalEEMod.
[6] Proposed Project: Proposed TOU + Proposed Flare + Proposed Engine + Proposed Miscellaneous Operational Sources.
[7] Source: SCAQMD (2023).
[8] Peak operating day with emergency engine usage is shown here. A typical day would not involve emergency generator usage, which is limited to maintenance and testing hours only.
[9] SOx EF is based on daily/hourly BACT basis (85 ppm or 14.354 lb/mmscf). Proposed TOU SOx emissions include 100% of the Landfill Tail Gas SOx emissions + SOx from supplemental fuel. Proposed Flare SOx emissions include SOx from supplemental fuel.
[10] Total PM_{10} / $PM_{2.5}$ comprises fugitive dust plus engine exhaust.

3.3 Localized Significance Threshold Analysis

The SCAQMD's LST methodology (SCAQMD 2008a) was used to analyze the neighborhood scale impacts of NO_x, carbon monoxide (CO), PM_{10}, and $PM_{2.5}$ associated with Project-specific mass emissions. Introduced in 2003, the LST methodology was revised in 2008 to include the $PM_{2.5}$ significance threshold methodology and update the LST mass rate lookup tables for the new 1-hour nitrogen dioxide (NO_2) standard.

For determining localized air quality impacts from small projects in a defined geographic source-receptor area (SRA), the LST methodology provides mass emission rate lookup tables for 1-acre, 2-acre, and 5-acre parcels by SRA. The tabulated LSTs represent the maximum mass emissions from a project that will not cause or contribute to an exceedance of California or national ambient air quality standards (CAAQS or NAAQS) for the above pollutants and were developed based on ambient concentrations of these pollutants for each SRA in the South Coast Air Basin (SCAQMD 2008a).

For most land use projects, the highest daily emission rates occur during the site preparation and grading phases of construction; where applicable, these maximum daily emissions were used in the LST analysis.

The proposed Project site is 4.24 acres in SRA Zone 19 – Saddleback Valley. As a conservative estimate, the 2-acre screening lookup tables were used to evaluate NO_x, CO, PM_{10}, and $PM_{2.5}$ impacts on nearby receptors. The nearest receptor is approximately 1,300 meters (4,200 feet) away from the proposed RNG facility. Therefore, the impact evaluation was performed using the closest distance within SCAQMD LST tables of 500 meters for construction (SCAQMD 2008a).

3.3.1 Construction

The LST results provided in Table 3-8 show that on-site emissions from construction would meet the LST passing criteria at the nearest receptors. Thus, impacts would be less than significant.

PROJECTED IMPACT: Less Than Significant (LTS)

Table 3-8: Construction Localized Significance Threshold Evaluation

Criteria Pollutants	Construction Emissions (lbs/day)	Threshold (lbs/day)	Percent of Threshold	Result
NO_x	56.8	233	24.4%	Pass
CO	50.0	8,454	0.6%	Pass
PM_{10}	24.9	129	19.3%	Pass
$PM_{2.5}$	6.5	74	8.7%	Pass

Sources: SCAQMD 2008a, CalEEMod version 2022.1.1.28.

Notes:

SRA: Zone 19 – Saddleback Valley. 2-acre area, 500 meters to receptor.

3.3.2 Operation

An AQIA was conducted to evaluate localized air quality impacts from operational emissions and is discussed in Section 4.3.1.

3.4 Greenhouse Gas Emissions from Construction and Operation

GHGs – primarily CO_2, methane (CH_4), and nitrous oxide (N_2O), collectively reported as carbon dioxide equivalents (CO_2e) – are directly emitted from stationary source combustion of natural gas in equipment such as water heaters, boilers, process heaters, and furnaces. GHGs are also emitted from mobile sources, such as on-road vehicles and off-road construction equipment, burning fuels such as gasoline, diesel, biodiesel, propane, or natural gas (compressed or liquefied). Indirect GHG emissions result from electric power generated elsewhere (i.e., power plants) used to operate process equipment, lighting, and utilities at a facility. Also, included in GHG quantification is electric power used to pump the water supply (e.g., aqueducts, wells, pipelines) and disposal and decomposition of municipal waste in landfills (CARB 2022a).

California's Building Energy Efficiency Standards are updated on an approximately 3-year cycle. The 2022 standards improved upon the 2019 standards for new construction of, and additions and alterations to, residential, commercial, and industrial buildings. The 2022 standards went into effect on January 1, 2023 (CEC 2022).

Since the Title 24 standards require energy conservation features in new construction [e.g., high-efficiency lighting; high-efficiency heating, ventilation, and air conditioning (HVAC) systems; thermal insulation; double-glazed windows; water conserving plumbing fixtures; etc.], they indirectly regulate and reduce GHG emissions.

Using CalEEMod, direct on-site and off-site GHG emissions were estimated for construction and operation, and indirect off-site GHG emissions were estimated to account for electric power used by the proposed Project, water conveyance, and solid waste disposal. CalEEMod also quantifies common refrigerant GHGs (abbreviated as "R" in the model output) used in air conditioning and refrigeration equipment, some of which are hydrofluorocarbons (HFCs).

The SCAQMD officially adopted an industrial facility mass emissions threshold of 10,000 metric tons (MT) CO_2e per year (SCAQMD 2023).

The City of Irvine adopted its Climate Action and Adaptation Plan (CAAP) in June 2021. The measures identified in the CAAP represent the City's actions to achieve the GHG reduction targets of Assembly Bill (AB) 32 for target year 2030. Local measures included in the CAAP include:

- An energy measure that directs the City to create an energy action plan to reduce energy consumption citywide;
- Land use and transportation measures that encourage alternative modes of transportation (walking, biking, and transit), reduce motor vehicle use by allowing a reduction in parking supply, voluntary transportation demand management to reduce vehicle miles traveled, and land use strategies that improve jobs-housing balance (increased density and mixed-use); and
- Solid waste measures that reduce landfilled solid waste in the City.

Table 3-9 shows a breakdown of the Project construction GHG emissions over the approximately 1.5 years construction period. Table 3-10 shows a breakdown of the Project operation GHG emissions. All CO_2 derived from LFG is considered biogenic (i.e., are part of the natural biological/physical carbon cycle) and does not result in a net increase in atmospheric CO_2. All CH_4 and N_2O emissions are anthropogenic and result in net increases in atmospheric GHG. Thus, for the tail gas streams, the combustion byproducts of CH_4 and N_2O are included in this analysis

but biogenic CO_2, both as a component of the tail gas streams and formed from combustion, are excluded.[1] Details of the analysis are shown in Appendix D.

Table 3-11 combines the emissions from Table 3-9 and Table 3-10 for comparison to baseline emissions. Baseline emissions include CH_4 and N_2O resulting from combustion of 6,000 scfm LFG. As shown in Table 3-11, incremental GHG emissions from operations are below the applicable SCAQMD CEQA significance threshold. The Project is expected to have a less than significant impact.

PROJECTED IMPACT: Less Than Significant (LTS)

Table 3-9: Construction Greenhouse Gas Emissions Summary by Year

Year	CO_2	CH_4	N_2O	R	CO_2e
	MT/yr	MT/yr	MT/yr	MT/yr	MT/yr
2025	940.73	0.05	0.06	0.36	959
2026	233.97	0.01	0.00	0.04	236
Total	**1,174.70**	**0.06**	**0.06**	**0.40**	**1,194**

Source: CalEEMod version 2022.1.1.28

Table 3-10: Operation Greenhouse Gas Emissions Summary by Sector/Equipment

Year	CO_2	CH_4	N_2O	R	CO_2e
	MT/yr	MT/yr	MT/yr	MT/yr	MT/yr
Mobile	17.79	0.00	0.001	0.03	18
Area	0.50	0.00	0.000	0.00	1
Energy	116.17	0.01	0.001	0.00	117
Water	10.92	0.18	0.004	0.00	17
Waste	2.66	0.27	0.000	0.00	9
Refrigeration	0.00	0.00	0.000	0.95	1
Thermal Oxidizer (TOU)	8,195.16	0.26	0.026	0.00	8,210
Off-Spec Flare	46.46	0.02	0.026	0.00	55
Genset with ICE	4.61	0.002	0.0026	0.00	5
Total	**8,394.3**	**0.74**	**0.06**	**0.98**	**8,432**

Source: CalEEMod version 2022.1.1.28

[1] EPA has identified biogenic sources (that is, sources not related to energy production and consumption) as those with GHG emissions that are generated during the decomposition of biologically based material, such as landfills, manure management, wastewater treatment, livestock respiration, fermentation processes, and combustion of biogas not resulting in energy production (for example, flaring of collected LFG). Some climate models do not include biogenic CO_2 emissions from the decomposition of organic material, because decomposition is part of the natural carbon cycle. Biogenic GHG emissions need not be considered part of the project's indirect and direct GHG emissions if it can be demonstrated that they are part of the natural biological/physical carbon cycle and do not result in a net increase of GHG emission. (AEP 2016)

Table 3-11: Greenhouse Gas Emissions Summary and Significance Evaluation

GHGs	Baseline (MT/yr)[1]	Construction (MT/yr)	Operation (MT/yr)[1]	Total[2] (MT/yr)	Expected Net Change in Emissions (MT/yr)	Threshold (MT/yr)	Significance
Anthropogenic CO_2	0	1,174.70	8,394.3	8,433	8,433	–	–
CH_4	6	0.06	0.74	0.74	-4.80	–	–
N_2O	1	0.06	0.06	0.06	-1.03	–	–
R	0	0.4	0.98	0.99	0.99	–	–
Anthropogenic Total (as CO_2e)	464	1,194	8,432	8,472	8,007	10,000	LTS

Sources: SCAQMD 2008b, Yorke 2024 (Appendix D), CalEEMod version 2022.1.1.28.

Notes:

[1]All CO_2 derived from LFG is considered biogenic and does not result in a net increase in atmospheric CO_2. All CH_4 and N_2O emissions are anthropogenic and result in net increases in atmospheric GHG. Thus, the combustion byproducts of CH_4 and N_2O are included in this analysis.

[2]Total CO_2e emissions comprises annual operational emissions plus construction emissions amortized over 30 years.

4.0 MODELING AND HEALTH RISK ASSESSMENT

CEQA requires that the environmental impacts of a proposed project be identified and assessed. If these impacts are found to be significant, the impacts must be mitigated to the extent feasible.

The SCAQMD has developed CEQA thresholds for determination of significance and determination if AQIA modeling is required (SCAQMD 2023); these criteria are described further in Section 5. Per SCAQMD Final Localized Significance Threshold Methodology, LST analysis is not applicable for project sites where emissions are distinctly non-uniform across the site (SCAQMD, 2008a); therefore, an AQIA was conducted for operations.

The modeling analyses discussed in this section include criteria pollutant AQIA modeling with respect to the NAAQS/CAAQS/SCAQMD thresholds for operational activities and two separate HRAs for construction and operations.

The methodology used to develop the AQIA and HRAs is described below and based on SCAQMD guidance documents and policies, in particular, "South Coast AQMD Modeling Guidance for AERMOD" (SCAQMD 2016). The AERMOD dispersion model was used as the basis for both the AQIA and HRAs.

4.1 Dispersion Modeling

4.1.1 Air Dispersion Model

The air dispersion model used for the AQIA/HRAs is the **A**MS/**E**PA **R**egulatory **Mod**el (AERMOD). AERMOD is a steady-state plume dispersion model that incorporates air dispersion calculations based on planetary boundary layer turbulence structure and scaling concepts. AERMOD includes the treatment of both surface and elevated sources and simple and complex terrain. AERMOD, like most dispersion models, uses mathematical algorithms to characterize the atmospheric processes that disperse pollutants emitted by a source. Using emission rates, release parameters, terrain characteristics, and

meteorological inputs, AERMOD calculates downwind pollutant concentrations at specified receptor locations.

The Lakes Environmental Software Implementation/user interface, AERMOD View™, version 12.0.0, was used for this Project. This version of AERMOD View™ implements version 23132 of AERMOD.

4.1.2 Modeling Options

AERMOD View™ allows the user to select from a variety of dispersion options. For this project, "Regulatory Default" options were used.

4.1.3 Meteorological Data

Five years of AERMOD-ready preprocessed meteorological data files for 2012-2016 were obtained from the SCAQMD for the Mission Viejo (MSV) meteorological station (SCAQMD 2016).

4.1.4 Terrain Data

Digital elevation data were imported into AERMOD and elevations were assigned to receptors, buildings, and emissions sources, as necessary. Future on-site buildings have elevations set to their post-construction elevations. National Elevation Dataset (NED) elevation data were obtained through the AERMOD View™ WebGIS import feature. The dataset has a resolution of approximately 10 meters. Per SCAQMD modeling guidance, since some receptors are lower and some receptors are higher than the base elevation of the sources, AERMOD was run twice– once using the default elevated option and the second time using the non-default (flat) option. The maximum ground-level concentration from both runs, whichever is greater, is reported.

4.1.5 Urban/Rural Dispersion Coefficient

Consistent with SCAQMD guidance, the model uses urban dispersion coefficients and the population of the County where the Project is located. The Project is located in Orange County, so the model used a population of 3,010,232.

4.1.6 Receptor Locations

Grid receptors representing nearby residents, sensitive receptors, and off-site workers were located:

- Every 100 meters along the facility boundary;
- At 50-meter spacing from the center of source locations out to 1,000 meters; and
- At 250-meter spacing between 1,000 meters and 5,000 meters from the center of source locations.

For the HRA, additional receptor grids were placed in residentially dense areas to ensure worst-case concentrations were captured.

For the construction HRA, since AERMOD does not correctly predict concentrations for receptors within volume source exclusion zones, receptors located within the RNG Plant boundary or within the truck volume source exclusion zone were excluded.

Figure 4-1 shows the facility layout, buildings, and receptor locations.

Figure 4-1: Air Dispersion Modelling Receptor Setup

Notes:
RNG Plant buildings shown in blue. Bowerman landfill boundary shown in red. Receptor locations shown in light green.

4.1.7 Buildings

For the operational HRA and AQIA, the modeling included existing and future on-site and off-site structures expected to have the potential to result in downwash effects. Building downwash effects were assessed for all emissions sources using the Building Profile Input Program for PRIME (BPIPPRM).

Building locations are shown in Figure 4-1. Building locations and dimensions are included with the AERMOD Project files.

Buildings were not included in the construction HRA since the modeling solely involves volume and line-volume sources, neither of which are affected by building downwash.

4.1.8 Source Information and Release Parameters

For the HRAs, AERMOD was run with a unit emission rate [1 gram per second (g/s)] for each source to calculate the concentration of TACs from each source per unit emission rate, known as X/Q (Chi/Q), for 1-hour and period (annual) averaging time options per receptor. The modeled X/Q concentration was calculated for each source, at each receptor, for each averaging time for input into the Hotspots Analysis and Reporting Program, version 2 (HARP2).

4.1.8.1 Construction

HRA modeling was conducted for the DPM exhaust from the construction equipment and delivery trucks. The construction HRA encompassed all stages of construction spanning the 1-year period.

Source release parameters for each source are described in detail below; the sources are shown in Figure 4-2. DPM emissions from the RNG Plant construction were modeled as a 47,961 square feet surface-based volume source in the middle of the site, corresponding to the total on-site land use in Table 3-1. The pipeline construction trucks were parameterized in AERMOD as a 3,917-meter (2.43-mile) line-volume source. The path was set based on the proposed pipeline trenching pathway. The line-volume source represents a series of separated volume sources with parameters based on truck dimensions and the algorithms in the United States Environmental Protection Agency's (U.S. EPA's) Haul Road Workgroup for volume sources (EPA 2012).

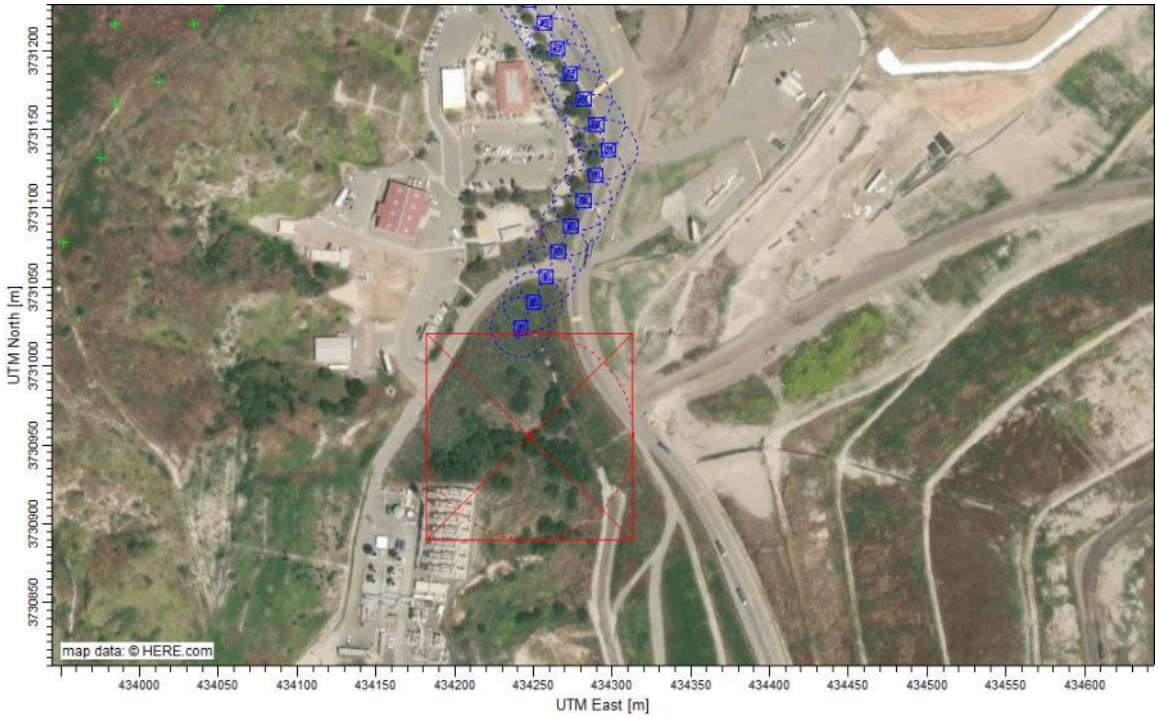
Table 4-1: Source Parameters – RNG Facility Construction

Source ID	Source Type	Release Height (m)	Length of Side (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
RNG_FAC	Volume	2.5	131.06	30.48	1.16

Table 4-2: Source Parameters – SoCalGas Pipeline Construction

Source ID	Source Type	Plume Height (m)	Plume Width (m)	Release Height (m)	Total Length (m)
PIPELINE	Line Volume	5.1	9.0	2.55	3917

Figure 4-2: Construction HRA Source Setup



Notes:

Volume source for the RNG Plant construction shown in red.

Truck travel line volume source shown in blue.

4.1.8.2 Operations

An AQIA and HRA for the proposed Project were prepared to evaluate criteria pollutant levels and health risk impacts due to operational emissions. The equipment and operations that would contribute to the emissions of criteria pollutants and TACs from the combustion equipment, and thus were included in the AQIA/HRA, are:

- The thermal oxidizer unit that uses tail gas from the landfill and natural gas as the supplemental fuel;
- The off-spec flare pilot that uses natural gas; and
- The generator set ICE that uses natural gas.

Figure 4-3 shows the location of each source.

Figure 4-3: Operational AQIA/HRA Source Setup

Notes:

Point sources for flare, thermal oxidizer unit, and generator set with ICE shown in red.
Proposed Project building layout shown in blue.

All stationary sources were modeled as point sources, including the flare, thermal oxidizer unit, and generator set with ICE. The emissions for the point sources were based on the methodology discussed in Section 3.2.2, and further shown in Appendix D.

The release parameters utilized for each source are shown in Table 4-3.

For the AQIA, emissions for each criteria pollutant and source were used in AERMOD. Maximum hourly, daily, and annual emissions were used in modeling all hourly, 24-hour, and annual averaging periods, respectively. Maximum 8-hour emissions were used in modeling the 8-hour averaging period for CO.

For the HRAs, AERMOD was run with a unit emission rate for each source for 1-hour and period averaging times.

Table 4-3: Source Parameters – RNG Plant Operation

Source ID	Source Description	UTM Easting (m)	UTM Northing (m)	Release Height (ft)	Exit Temperature (°F)	Inside Diameter (ft)	Exhaust Flow (scfm)	Exit Velocity (m/s)
FLARE	Off-Spec Flare	434,255.01	3,730,882.74	50	1,018	11.77	150,000	7.003
ICE	CAT DG150 Backup Generator ICE	434,246.91	3,730,967.73	6.15	1,304	0.4167	1,177	43.852
TOU	PEI Thermal Oxidizer – Pilot Gas	434,255.52	3,730,894.15	50	1,000	5.6	39,000	8.044

4.2 Construction – Health Risk Assessment

The principal TAC emitted during Project construction would be DPM from diesel-powered equipment. DPM emissions were derived from the CalEEMod runs in Attachment A, where DPM is assumed to be the same amount as the exhaust PM_{10} emissions.

Although the total Project construction period is expected to occur over a span of approximately 1.5 years, the majority of DPM-emitting construction phases overlap during a 1-year period. Thus, a conservative approach was used, where the total DPM emissions from the RNG Plant and SoCalGas pipeline construction over the approximately 1.5-year period were assumed to simultaneously emit over a 1-year period. The DPM emission rates for the RNG Plant and SoCalGas pipeline construction are shown in Table 4-4. Annual emission rates were calculated by conservatively assuming that the total DPM exhaust emissions during construction occur over a single year. Hourly emission rates were calculated by dividing the total DPM emissions by the number of working days, divided by 24 hr (e.g, 151 lbs / 302 days / 24 hr / day = 0.0208 lbs/hr).

Table 4-4: DPM Emissions for RNG Plant and SoCalGas Pipeline Construction

Construction Phase	DPM (PM_{10}) Exhaust Emissions During Construction (lbs)	Working Days	Annual Emission Rate[1] (lbs/year)	Hourly Emission Rate (lbs/hour)
RNG Facility Construction	151	302	151	0.0208
SoCalGas Pipeline Construction	234	327	234	0.0298

1) To be conservative, it was assumed that the total DPM exhaust emissions during construction occur over a single year.

4.2.1 Health Risk Assessment Calculations

This HRA was conducted in accordance with SCAQMD Risk Assessment Procedures (SCAQMD 2017) and the Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program Guidance Manual (OEHHA 2015).

The construction HRA health risk calculations were performed using the HARP2 Air Dispersion Modeling and Risk Tool (ADMRT, version 22118, CARB 2022b). The X/Q 1-hour and annual values that were determined for each source using AERMOD were imported into HARP2 and used in conjunction with hourly and annual emissions to determine the ground-level concentration (GLC) of DPM to an individual. The GLCs were then used to estimate the long-term cancer health risk to an individual. Since DPM is the only TAC in this HRA, and only carcinogenic and chronic toxicity values are documented for DPM, only cancer and chronic risk assessments were conducted.

A description of the health risk indices and associated calculations conducted in HARP2 is provided below. Table 4-5 provides a listing of the HARP2 options that were selected for the analysis.

4.2.2 Cancer Risk

Cancer risk is the estimated probability of a maximally exposed individual potentially contracting cancer as a result of exposure to TACs over a period of time. Cancer risk at all receptors was estimated over a 1-year period, corresponding to the 1-year construction period shown in Table 4-4. This provides a conservative health risk estimate since the total DPM emissions are assumed to be emitted over a single year, which provides the largest overlap with the highest sensitive specific age group weighting factors (3rd trimester and 0-2 years).

Residential receptor cancer risk estimates were calculated using CARB's Risk Management Policy (RMP), "RMP Using the Derived Method," and off-site workplace cancer risk estimates used the "OEHHA Derived" calculation method. The RMP uses high-end breathing rates (95th percentile) for children from the third trimester through age 2 and 80th percentile breathing rates for all other ages for residential exposures (CARB 2015). The "OEHHA Derived" method uses high-end exposure parameters for the top two exposure pathways and mean exposure parameters for the remaining pathways for cancer risk estimates. The "RMP Using the Derived Method" combines the two approaches.

4.2.3 Chronic Hazard Index

DPM also has non-cancer health risk due to long-term (chronic) exposure. The Chronic Hazard Index (HIC) is the sum of the individual substance HICs for all TACs affecting the same target organ system. Chronic risk was calculated using the "OEHHA Derived" Method at all receptors for an annual exposure duration. The same exposure pathways, as outlined in Table 4-5, were used in the HIC assessment.

4.2.4 Acute Hazard Risk

Some TACs may have non-cancer health risk due to short-term (acute) exposures. Acute Hazard Index (HIA) is the sum of the individual substance HIAs for all TACs affecting the same target organ system. Since DPM does not have an acute reference exposure level (REL), no acute risks were estimated for the construction scenario.

Table 4-5: Construction HRA – HARP2 Model Options

Parameter	Assumptions				Comments
Multi-Pathway					
Inhalation	Res	☒	Work	☒	–
Soil	Res	☒	Work	☒	–
Dermal	Res	☒	Work	☒	"Warm" climate
Mother's Milk	Res	☒	Work	☐	–
Drinking Water	Res	☐	Work	☐	–
Fish	Res	☐	Work	☐	–
Homegrown Produce	Res	☒	Work	☐	Default for "Households that Garden"
Beef/Dairy	Res	☐	Work	☐	–
Pigs, Chickens, and/or Eggs	Res	☐	Work	☐	
Deposition Velocity	0.02 m/s				
Residential Cancer Risk Assumptions					
Exposure Duration	1 year				Corresponding to overlapped 1-year construction period
Fraction of Time at Home	3rd Trimester to 16 years: Off 16 years to 30 years: On				–
Analysis Option	RMP Using the Derived Method				–
Worker Cancer Risk Assumptions					
Exposure Duration	1 year				Corresponding to overlapped 1-year construction period
Analysis Option	OEHHA Derived Method				–
Inhalation Rate Basis	8-hour breathing rates, moderate intensity				–
Worker Adjustment Factor	Yes, 5.6				Construction will take place 5 days/week, 6 hours/day
Residential and Worker Non-Cancer Risk Assumptions					
Analysis Option	OEHHA Derived Method				–
Inhalation Rate Basis	Long-term 24-hour (resident) Moderate 8-hour (worker)				–
Worker Adjustment Factor	1				–

4.2.5 Construction HRA Results

The construction HRA results predict that all health risk factors would be less than the CEQA significance thresholds at all actual receptors. The results of the HRA are summarized in Table 4-6.

The maximally exposed individual resident (MEIR) was predicted to be at the end of the pipeline construction line within the Portola Springs community, and the maximally exposed individual worker (MEIW) was predicted to be Jimni Systems Inc., located west of State Route 133. Figure 4-4 shows the locations of the MEIR and MEIW receptors. All

health risk values were predicted to be less than the CEQA significance thresholds and are shown in Table 4-6.

Figure 4-4: Maximally Exposed Receptors – Construction HRA Cancer Risk

Notes:

RNG Plant shown in red. Truck travel line volume source shown in blue.

MEIR shown in light green circle. MEIW shown in orange circle.

Table 4-6: Summary of Construction HRA Results

Risk[1]	Receptor	Receptor	UTM Easting Coordinate (m)	UTM Northing Coordinate (m)	Estimated Risk Value	CEQA Threshold[2]	Health Risk Significant?
Cancer	MEIR	2515	431,461	3,730,680	7.03	10 in one million	No
	MEIW	2565	433,119	3,731,289	0.26		No
Chronic	MEIR	2515	431,461	3,730,680	0.0079	1.0	No
	MEIW	2565	433,119	3,731,289	0.0036		No

1. Maximum risk values from flat terrain AERMOD run.
2. Source: SCAQMD 2023.

4.3 Operation

An AQIA and HRA for the proposed Project were prepared to evaluate criteria pollutant level and health risk impacts due to operational emissions. The equipment and operations that would contribute to the emissions of criteria pollutants and TACs from the combustion equipment, and thus be included in the AQIA/HRA, are:

- The thermal oxidizer unit that uses tail gas from the landfill and natural gas as the supplemental fuel;
- The off-spec flare pilot that uses natural gas; and
- The generator set ICE that uses natural gas.

Criteria pollutant and TAC emissions from operational activity for each of the sources are shown in Tables 4-7 to 4-9 and Table 4-10, respectively. Emission calculation methodology is shown in Appendix D.

Table 4-7: Criteria Pollutant Emissions from Operations – Thermal Oxidizer Unit

Pollutant	1-Hour Averaging Period (lb/hr)	8-Hour Averaging Period (lb/8-hr)	24-Hour Averaging Period (lb/24-hr)	Annual Averaging Period (lb/yr)
NO_2	1.054E+00	--	--	9.23E+03
SO_2	5.177E+00	--	1.243E+02	3.20E+04
CO	2.409E+00	1.927E+01	--	--
PM_{10}	--	--	5.162E+00	1.88E+03
$PM_{2.5}$	--	--	5.162E+00	1.88E+03

Table 4-8: Criteria Pollutant Emissions from Operations – Off-Spec Flare

Pollutant	1-Hour Averaging Period (lb/hr)	8-Hour Averaging Period (lb/8-hr)	24-Hour Averaging Period (lb/24-hr)	Annual Averaging Period (lb/yr)
NO_2	6.000E-03	--	--	5.256E+01
SO_2	5.714E-05	--	1.371E-03	5.006E-01
CO	6.000E-03	4.800E-02	--	--
PM_{10}	--	--	1.394E-02	5.089E+00
$PM_{2.5}$	--	--	1.394E-02	5.089E+00

Table 4-9: Criteria Pollutant Emissions from Operations – Generator Set with ICE

Pollutant	1-Hour Averaging Period (lb/hr)	8-Hour Averaging Period (lb/8-hr)	24-Hour Averaging Period (lb/24-hr)	Annual Averaging Period (lb/yr)
NO_2	1.672E-01	–	–	8.359E+00
SO_2	9.929E-04	–	4.170E-03	4.965E-02
CO	2.786E-01	1.170E+00	–	–
PM_{10}	–	–	6.950E-02	8.274E-01
$PM_{2.5}$	–	–	6.950E-02	8.274E-01

Table 4-10: TAC Emissions from Operations

Pollutant	CAS No.	Thermal Oxidizer Unit		Off-Spec Flare		Generator Set with ICE	
		Annual Emissions (lb/year)	Maximum Hourly Emissions (lb/hr)	Annual Emissions (lb/year)	Maximum Hourly Emissions (lb/hr)	Annual Emissions (lb/year)	Maximum Hourly Emissions (lb/hr)
1,3-Butadiene	106990	–	–	–	–	5.59E-02	1.12E-03
1,1-Dichloroethene	75354	2.13E-01	2.44E-05	–	–	–	–
1,1-Dichloroethane	75343	1.94E-01	2.21E-05	–	–	–	–
1,2-Dichloroethane	107062	2.31E+00	2.64E-04	–	–	9.52E-04	1.90E-05
1,1,1-Trichloroethane	71556	1.45E-01	1.65E-05	–	–	–	–
1,1,2-Trichloroethane	79005	–	–	–	–	1.29E-03	2.58E-05
1,1,2,2-Tetrachloroethane	79345	–	–	–	–	2.13E-03	4.27E-05
Acetaldehyde	75070	7.79E-01	8.89E-05	3.59E-02	4.10E-06	2.36E-01	4.72E-03
Acrolein	107028	6.78E-01	7.74E-05	8.34E-03	9.52E-07	2.22E-01	4.44E-03
Ammonia	7664417	8.04E+02	9.18E-02	–	–	2.65E-01	5.30E-03
Benzene	71432	1.99E+01	2.27E-03	1.33E-01	1.51E-05	1.33E-01	2.66E-03
Carbon Tetrachloride	56235	–	–	–	–	1.50E-03	3.00E-05
Chlorobenzene	108907	5.83E+01	6.65E-03	–	–	–	–
Chloroform	67663	6.13E-02	7.00E-06	–	–	1.16E-03	2.32E-05
Chrysene	218019	–	–	–	–	–	–

Pollutant	CAS No.	Thermal Oxidizer Unit		Off-Spec Flare		Generator Set with ICE	
		Annual Emissions (lb/year)	Maximum Hourly Emissions (lb/hr)	Annual Emissions (lb/year)	Maximum Hourly Emissions (lb/hr)	Annual Emissions (lb/year)	Maximum Hourly Emissions (lb/hr)
Ethyl Benzene	100414	1.73E+00	1.98E-04	1.20E+00	1.38E-04	2.09E-03	4.19E-05
Ethylene Dibromide	106934	–	–	–	–	1.80E-03	3.59E-05
Formaldehyde	50000	3.09E+00	3.53E-04	9.75E-01	1.11E-04	1.73E+00	3.46E-02
Hexane	110543	1.16E+00	1.32E-04	2.42E-02	2.76E-06	–	–
Methylene Chloride	75092	6.56E+00	7.49E-04	–	–	3.48E-03	6.95E-05
Methanol	67561	–	–	–	–	2.58E-01	5.16E-03
Naphthalene	91203	7.54E-02	8.60E-06	9.18E-03	1.05E-06	8.19E-03	1.64E-04
PAH	1151	2.51E-02	2.87E-06	2.50E-03	2.86E-07	–	–
Styrene	100425	–	–	–	–	1.00E-03	2.00E-05
Tetrachloroethene	127184	7.14E+00	8.16E-04	–	–	–	–
Toluene	108883	8.30E+01	9.47E-03	4.84E-02	5.52E-06	4.71E-02	9.42E-04
Trichloroethylene	79016	1.75E+00	1.99E-04	–	–	–	–
Vinyl Chloride	75014	1.09E+00	1.24E-04	–	–	6.06E-04	1.21E-05
Xylenes	1330207	6.45E+01	7.36E-03	2.42E-02	2.76E-06	1.65E-02	3.29E-04

4.3.1 Air Quality Impact Analysis

CEQA requires that the environmental impacts of a proposed project be identified and assessed. If these impacts are found to be significant, the impacts must be mitigated to the extent feasible.

The SCAQMD has developed CEQA thresholds for determination of significance and determination if AQIA modeling is required (SCAQMD 2023). Based on the size of the Project, modeling is required to demonstrate compliance with the NAAQS and CAAQS for five primary criteria pollutants, i.e., NO_2, CO, sulfur dioxide (SO_2), PM_{10}, and $PM_{2.5}$.

The purpose of the AQIA is to evaluate whether or not criteria pollutant emissions resulting from the proposed Project would cause or contribute significantly to a violation of the CAAQS or NAAQS. AERMOD was used to simulate the atmospheric transport and dispersion of airborne pollutants and to quantify the maximum expected GLCs from Project emissions. The air quality modeling methodology described in this section is based on SCAQMD policies and "South Coast AQMD Modeling Guidance for AERMOD" (SCAQMD 2016).

Each pollutant is modeled separately using maximum emission rates for the appropriate averaging time. The modeled concentration is combined with a conservative background concentration for comparison to the CAAQS/NAAQS. If the Project plus background concentration is less than the CAAQS/NAAQS, then Project emissions would have a less than significant impact. This technique was used to assess the impacts of the proposed Project's NO_x, CO, and SO_2 emissions.

Per CEQA threshold guidance (SCAQMD 2023), for PM_{10} and $PM_{2.5}$, the maximum modeled concentration is compared to the corresponding significant change threshold, see Table 4-12. If the Project concentration is less than the significant change threshold, then Project emissions would not contribute significantly to a violation of the CAAQS or NAAQS.

NO_2 modeling for the 1-hour and annual CAAQS/NAAQS followed the U.S. EPA Tier 1 technique outlined in the U.S. EPA NO_2 clarification memo (EPA 2024), which conservatively assumes that all NO_x converts to NO_2.

4.3.1.1 Background Air Quality

Dispersion modeling to evaluate compliance with air quality standards requires the use of measured air pollutant concentrations to account for the background contributions of regional emissions, i.e., emissions sources not explicitly included in the model simulations.

Table 4-11 presents the maximum observed ambient background data for each pollutant and averaging time at the nearest representative monitoring station for the most recent data available. The nearest monitoring sites with available data (Central Orange County and Downtown Los Angeles) are located in an area that likely has higher ambient pollutant concentrations than the proposed Project site. The tabulated values were used to represent background levels for the indicated pollutants and averaging times in the AQIA to evaluate compliance with the CAAQS or NAAQS. The monitoring data indicate that air quality in the Project area complies with all NAAQS and CAAQS for NO_2, CO, and SO_2. However, the CAAQS and NAAQS are periodically exceeded in the Project area for $PM_{2.5}$ and PM_{10}.

Table 4-11: AQIA Background Concentrations

Pollutant	Averaging Time	Standard	Monitoring Station	Ambient Background Data (concentration units)				AAQS (concentration units)	Exceeds Standard?	Background Concentration Notes
				2020	2021	2022	Summary			
NO_2 (Concentration Units = ppb)	1-Hour	California	SCAQMD; Central Orange County	70.9	67.1	53	70.9	180	No	Highest of most recent 3 years.
	Annual	Federal	SCAQMD; Central Orange County	13.3	12.4	11.8	13.3	53	No	Highest of most recent 3 years.
		California	SCAQMD; Central Orange County	13.3	12.4	11.8	13.3	30	No	Highest of most recent 3 years.
CO (Concentration Units = ppm)	1-Hour	Federal	SCAQMD; Central Orange County	2.3	2.1	2.4	2.4	35	No	Highest of most recent 3 years.
		California	SCAQMD; Central Orange County	2.3	2.1	2.4	2.4	20	No	Highest of most recent 3 years.
	8-Hour	Federal	SCAQMD; Central Orange County	1.7	1.5	1.4	1.7	9	No	Highest of most recent 3 years.
		California	SCAQMD; Central Orange County	1.7	1.5	1.4	1.7	9	No	Highest of most recent 3 years.

Pollutant	Averaging Time	Standard	Monitoring Station	Ambient Background Data (concentration units)				AAQS (concentration units)	Exceeds Standard?	Background Concentration Notes
				2020	2021	2022	Summary			
SO_2 (Concentration Units = ppb)	1-Hour	Federal	EPA; Main St, Los Angeles	3	2	2	2.3	75	No	The design value (=3-year average of 99th percentile of 1-hour daily max).
		California	EPA; Main St, Los Angeles	3.8	2.2	6.5	6.5	250	No	Highest of most recent 3 years.
	24-Hour	California	EPA; Main St, Los Angeles	0.9	1.2	1.2	1.2	40	No	Highest of most recent 3 years.
PM_{10} (Concentration Units = $\mu g/m^3$)	24-Hour	Federal	SCAQMD; Central Orange County	120	115	90	120	150	No	Highest of most recent 3 years.
		California	SCAQMD; Central Orange County	120	115	90	120	50	Yes	Highest of most recent 3 years.
	Annual	California	SCAQMD; Central Orange County	23.9	22.9	22.3	23.9	20	Yes	Highest of most recent 3 years.
$PM_{2.5}$ (Concentration Units = $\mu g/m^3$)	24-Hour	Federal	SCAQMD; Central Orange County	27.10	36.70	22.10	28.63	35	No	The design value (=3-year average of 98th percentile of 24-hour daily max).
	Annual	Federal	SCAQMD; Central Orange County	11.27	11.4	9.87	11.4	9	Yes	Highest of most recent 3 years.
		California	SCAQMD; Central Orange County	11.27	11.4	9.87	11.4	12	No	Highest of most recent 3 years.

4.3.1.2 Analysis Scenario and Emission Rates

The criteria pollutant modeling was conducted using the respective emission rate for each averaging times (1-hour, 8-hour, 24-hour, and annual), depending on the pollutant (e.g., 1-hour emission rate for 1-hour averaging period). Calculated emissions for each pollutant's averaging periods are shown in Tables 4-7 to 4-9, outlined in Appendix D, and contained in the electronic modeling files.

4.3.1.3 AQIA Results

Table 4-12 presents the maximum model-predicted concentrations from the proposed Project emissions, maximum background concentrations, and the sum of these concentrations in comparison to the NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$ CEQA thresholds. The AQIA modeling results presented in Table 4-12 demonstrate that the Project would not cause an exceedance of the NO_2, SO_2, or CO NAAQS or CAAQS.

Table 4-12 also shows that the model-predicted PM_{10} and $PM_{2.5}$ concentrations from the operational sources would not exceed the 24-hour and annual significant change thresholds. Thus, the proposed Project would not cause a violation of the NAAQS or CAAQS or contribute substantially to an existing air quality violation, and therefore, the proposed Project would have a less than significant impact on air quality.

PROJECTED IMPACT: Less Than Significant (LTS)

Table 4-12: AQIA Modeling Results for Project Operations

Pollutant	Averaging Time	Federal or State Standard	Modeled Concentration[1] (Concentration Units)	Background Concentration (Concentration Units)	Modeled + Background Concentration (Concentration Units)	CEQA Threshold (Concentration Units)	Significance
NO_2 (Concentration Units = ppb)	1-Hour	California[2]	0.825[F]	70.9	71.7	180	LTS
	Annual	Federal	0.027[E]	13.3	13.3	53	LTS
		California	0.027[E]	13.3	13.3	30	LTS
CO (Concentration Units = ppm)	1-Hour	Federal	0.003[F]	2.4	2.4	35	LTS
		California	0.003[F]	2.4	2.4	20	LTS
	8-Hour	Federal	0.001[F]	1.7	1.7	9	LTS
		California	0.001[F]	1.7	1.7	9	LTS
SO_2 (Concentration Units = ppb)	1-Hour	Federal	2.135 [F]	2.3	4.4	75	LTS
		California	2.341[F]	6.5	8.8	250	LTS
	24-Hour	California	0.612[E]	1.2	1.8	40	LTS
PM_{10} (Concentration Units = $\mu g/m^3$)	24-Hour	SCAQMD CEQA Significant Change Threshold	0.068[E]	–	–	2.5	LTS, modeled concentration is less than significant change threshold.
	Annual		0.010[E]	–	–	1	
$PM_{2.5}$ (Concentration Units = $\mu g/m^3$)	24-Hour		0.068[E]	–	–	2.5	

Notes:

1. Superscript E indicates elevated terrain AERMOD run; superscript F indicates flat terrain AERMOD run.
2. The modeled concentration presented is the model predicted maximum hourly value using full NO2 conversion.

4.3.2 Operations – Health Risk Assessment

An HRA for the proposed Project was prepared to evaluate health risk impacts due to operational TAC emissions. The equipment and operations that would contribute to the emissions of TACs/hazardous air pollutants (HAPs) from the combustion equipment, and thus were included in this HRA, are:

- The thermal oxidizer unit that uses tail gas from the landfill and natural gas as the supplemental fuel;
- The off-spec flare pilot that uses natural gas; and
- The generator set ICE that uses natural gas.

The SCAQMD has defined CEQA health risk thresholds for long-term and short-term health impacts. All three combustion units emit TACs that potentially have the following health impacts to residential, sensitive, and worker receptors: long-term cancer risk, chronic (long-term) health hazard (HIC) to various human organs and systems, and acute (short-term) health hazards (HIA). The SCAQMD CEQA thresholds of significance for these health risks are as follows:

- Cancer risk greater than or equal to 10 in one million;
- HIC greater than or equal to 1.0; and
- HIA greater than or equal to 1.0.
- Cancer Burden >0.5 excess cancer cases (in areas ≥1 in one million)

The TAC emissions from the thermal oxidizer unit, off-spec flare, and generator set with ICE operational sources are shown in Table 4-10 and in Appendix D. The thermal oxidizer unit and off-spec flare are assumed to operate continuously. The generator set with ICE emissions were calculated based on the permit application maintenance and testing hours (4.2 hours per day, 50 hours per year).

4.3.2.1 Health Risk Assessment Calculations

This HRA was conducted in accordance with SCAQMD Risk Assessment Procedures (SCAQMD 2017) and the OEHHA Air Toxics Hot Spots Program Guidance Manual (OEHHA 2015).

The construction HRA health risk calculations were performed using the HARP2 ADMRT, version 22118 (CARB 2022b). The X/Q 1-hour and annual values that were determined for each source using AERMOD were imported into HARP2 and used in conjunction with hourly and annual emissions to determine the GLC of each TAC to an individual. The GLCs were then used to estimate the long-term cancer, chronic, and acute health risks to an individual.

Table 4-13 provides a listing of the HARP2 options that were selected for the analysis.

4.3.2.2 Cancer Risk

Cancer risk is the estimated probability of a maximally exposed individual potentially contracting cancer as a result of exposure to TACs over an extended period of time. This HRA estimated cancer risk over a 30-year period for residential receptor locations and 25 years for off-site worker receptor locations.

Residential receptor cancer risk estimates were calculated using CARB's "RMP Using the Derived Method," and off-site workplace cancer risk estimates used the "OEHHA Derived" calculation method. The RMP uses high-end breathing rates (95th percentile) for children from the third trimester through age 2 and 80th percentile breathing rates for all other ages for residential exposures (CARB/CAPCOA 2015). The "OEHHA Derived" method uses high-end exposure parameters for the top two exposure pathways and mean exposure parameters for the remaining pathways for cancer risk estimates. The "RMP Using the Derived Method" combines the two approaches.

4.3.2.3 Chronic Hazard Index

The emitted TACs also have non-cancer health risks due to long-term (chronic) exposure. The HIC is the sum of the individual substance HICs for all TACs affecting the same target organ system. Chronic risk was calculated using the "OEHHA Derived" Method at all receptors for an annual exposure duration. The same exposure pathways, as outlined in Table 4-13, were used in the HIC assessment.

4.3.2.4 Acute Hazard Risk

Some TACs may have non-cancer health risk due to short-term (acute) exposures. The HIA is the sum of the individual substance HIAs for all TACs affecting the same target organ system. Acute risk was calculated at all receptors for an exposure duration of 1 hour.

Table 4-13: Operational HRA – HARP2 Model Options

Parameter	Assumptions				Comments
Multi-Pathway					
Inhalation	Res	☒	Work	☒	–
Soil	Res	☒	Work	☒	–
Dermal	Res	☒	Work	☒	"Warm" climate
Mother's Milk	Res	☒	Work	☐	–
Drinking Water	Res	☐	Work	☐	–
Fish	Res	☐	Work	☐	–
Homegrown Produce	Res	☒	Work	☐	Default for "Households that Garden"
Beef/Dairy	Res	☐	Work	☐	–
Pigs, Chickens, and/or Eggs	Res	☐	Work	☐	
Deposition Velocity	0.02 m/s				
Residential Cancer Risk Assumptions					
Exposure Duration	30 year				–
Fraction of Time at Home	3rd Trimester to 16 years: On 16 years to 30 years: On				Maximum residential cancer risk is less than 1 in a million; therefore, one in a million isopleth does not exist.
Analysis Option	RMP Using the Derived Method				–
Worker Cancer Risk Assumptions					
Exposure Duration	25 year				–
Analysis Option	OEHHA Derived Method				–
Inhalation Rate Basis	8-hour breathing rates, moderate intensity				–
Worker Adjustment Factor	1				–
Residential and Worker Non-Cancer Risk Assumptions					
Analysis Option	OEHHA Derived Method				–
Inhalation Rate Basis	Long-term 24-hour (resident) Moderate 8-hour (worker)				–
Worker Adjustment Factor	1				–

4.3.2.5 Operational HRA Results

The operational HRA results predict that all health risk factors would be less than the CEQA significance thresholds at all actual receptors. The results of the HRA are summarized in Tables 4-14 through 4-16.

The MEIR and MEIW were predicted to be the same for all health risk indices (i.e., cancer, chronic, and acute health risks). The MEIR was predicted to be at the southwest of the Project site within the Portola Springs community, and the MEIW was predicted to be Jimni Systems Inc., located west of State Route 133. Figure 4-5 shows the locations of the MEIR and MEIW receptors.

Figure 4-5: Operational HRA MEIR and MEIW Receptor Locations

Blue Circle: MEIR for Cancer and Chronic Health Risks.
Orange Circle: MEIR for Acute Health Risk.
Purple Circle: MEIW for Cancer, Chronic. And Acute Health Risks.

4.3.2.5.1 Cancer Risk

The HRA predicted that the cancer risk at all receptor types would be below 10 in one million, which is below the CEQA threshold. Figure 4-5 shows the locations of the MEIR and MEIW receptors. As the cancer risk was below 1 in one million, no isopleth was created. Table 4-14 presents the 30-year cancer risk at the MEIR and the 25-year cancer risk at the MEIW, plus the coordinates of each receptor.

Table 4-14: Cancer Risk Results

Receptor	Exposure Duration	Cancer Risk (in one million)	UTM Easting (m)	UTM Northing (m)	CEQA Threshold[2]
MEIR[1]	30-Year	0.0043	433,054	3,730,131	10 in one million
MEIW[1]	25-Year	0.0003	433,145	3,731,325	

1. Maximum Risk from flat terrain AERMOD run.
2. Source: SCAQMD 2023.

4.3.2.5.2 Chronic Hazard Index

The HIC at all receptor types due to operational emissions was predicted to be well below the CEQA threshold of 1.0. Figure 4-5 shows the locations of the MEIR and MEIW receptors. Table 4-15 presents the HIC at the MEIR and the annual and 8-hour HIC at the MEIW, plus the coordinates of each receptor.

Table 4-15: Chronic Hazard Index Results

Receptor	Exposure Duration	HIC	UTM Easting (m)	UTM Northing (m)	CEQA Threshold[2]
MEIR[1]	Annual	0.00002	433,054	3,730,131	1.0
MEIW[1]		0.00002	433,145	3,731,325	
MEIW[1]	8-hour	0.00001	433,145	3,731,325	

1. Maximum Risk from flat terrain AERMOD run.
2. Source: SCAQMD 2023.
3. The HIC at the MEIW was estimated on an annual and 8-hour basis.

4.3.2.5.3 Acute Hazard Index

The HIA at all actual receptors due to Project emissions was predicted to be below the CEQA threshold of 1.0. Figure 4-5 shows the locations of the MEIR and MEIW receptors. As the HIA was below 0.5, no isopleth was created. Table 4-16 presents the HIA at the MEIR and MEIW receptors, plus the coordinates of each receptor.

Table 4-16: Acute Hazard Index Results

Receptor	Exposure Duration	HIA	UTM Easting (m)	UTM Northing (m)	CEQA Threshold[2]
MEIR[1]	1-Hour	0.0028	433,233	3,730,037	1.0
MEIW[1]		0.0033	433,145	3,731,325	

1. Maximum Risk from flat terrain AERMOD run.
2. Source: SCAQMD 2023.

All health risk values were predicted to be less than the CEQA significance thresholds and show that for all receptor types, i.e., MEIR and MEIW, the predicted health risks would be well below the CEQA cancer, non-cancer chronic, and acute health risk thresholds. Since the cancer risk would be less than 1 in one million for any real receptor, there is no excess cancer burden to evaluate.

5.0 ANALYSIS OF AIR QUALITY SIGNIFICANCE CRITERIA

Estimated construction and operational impacts were evaluated based on the emissions presented in this report and compared against quantitative criteria established by the SCAQMD. These criteria are relied upon to make significance determinations based on mass emissions of criteria pollutants. As shown above, the proposed Project would result in a less than significant impact related to regional and localized emissions, which would not be cumulatively considerable. Further, the proposed Project would not conflict with SCAQMD planning goals, cause substantial air pollutant concentrations, or be a source of objectionable odors.

5.1 Environmental Determination

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

Less Than Significant Impact. The Project site is located in the South Coast Air Basin, comprising all of Orange County and the non-desert regions of Los Angeles, Riverside, and San Bernardino Counties. The SCAQMD is the agency primarily responsible for comprehensive air pollution control in the South Coast Air Basin and reducing emissions from area and point stationary, mobile, and indirect sources. The SCAQMD prepared the 2022 Air Quality Management Plan (AQMP) to meet federal and State ambient air quality standards. The 2022 AQMP contains a comprehensive list of pollution control strategies directed at reducing emissions and achieving ambient air quality standards. These strategies are developed, in part, based on regional population, housing, and employment projections prepared by the Southern California Association of Governments (SCAG). SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and addresses regional issues relating to transportation, the economy, community development, and the environment. With regard to future growth, SCAG has prepared the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (2020-2045 RTP/SCS), which provides population, housing, and employment projections for cities under its jurisdiction. These growth projections are based in part on projections originating under County and City General Plans. These growth projections were utilized in the preparation of the air quality forecasts and consistency analysis included in the 2022 AQMP. The 2020-2045 RTP/SCS was approved in September 2020.

The 2022 AQMP was adopted by the SCAQMD Governing Board on December 2, 2022, as a program to lead the South Coast Air Basin into compliance with several criteria pollutant standards and other federal requirements. It relies on emissions forecasts based on demographic and economic growth projections provided by SCAG's 2020-2045 RTP/SCS. SCAG is charged by California law to prepare and approve "the portions of each AQMP relating to demographic projections and integrated regional land use, housing, employment, and transportation programs, measures and strategies." Projects whose growth is included in the projections used in the formulation of the AQMP are considered to be consistent with the plan and not to interfere with its attainment. The SCAQMD recommends that, when determining whether a project is consistent with the current AQMP, a lead agency must assess whether the project would directly obstruct implementation of the plan and whether it is consistent with the demographic and economic assumptions (typically land use-related, such as resultant employment or residential units) upon which the plan is based (SCAQMD 2022).

A significant air quality impact may occur if a project is inconsistent with the AQMP or would in some way represent a substantial hindrance to employing the policies or obtaining the goals of that plan. As shown above, the incremental emissions from the proposed Project do not exceed the SCAQMD's established thresholds of potential significance for air quality impacts. The proposed Project would provide a beneficial use for the LFG generated at the landfill and would be consistent with the goals and objectives of the AQMP. Therefore, the Project would not increase the frequency or severity of an air quality standards violation or cause a new violation. Furthermore, the Project is consistent with the land use and zoning designation through development of the proposed Project. Because the Project would be consistent with the City's General Plan, it is also consistent with the regional growth projections adopted in the 2022 AQMP. Air quality emissions generated by the proposed Project are considered to be evaluated in the AQMP, and Project development in accordance with the City's General Plan would not conflict with or obstruct implementation of the regional 2022 AQMP. Thus, the proposed Project is not expected to conflict with or obstruct the implementation of the AQMP and SCAQMD rules. Therefore, impacts would be less than significant, and no mitigation is required.

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

Less Than Significant Impact. To evaluate impacts, quantitative significance criteria established by the local air quality agency, such as the SCAQMD, may be relied upon to make significance determinations based on mass emissions of criteria pollutants.

A significant impact would occur if the proposed Project would violate any air quality standard or contribute substantially to an existing or projected air quality violation. Project construction emissions were estimated using CalEEMod, the statewide land use emissions computer model designed to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from land use projects. According to the CalEEMod model results, as outlined in this report, overall construction (maximum daily emissions) for the proposed Project would not exceed the SCAQMD thresholds for the criteria pollutants ROG, NO_x, CO, oxides of sulfur (SO_x), and respirable and fine particulate matter (PM_{10} and $PM_{2.5}$, respectively). As shown in Tables 3-6, the Project is estimated to generate less than the SCAQMD threshold of 75 pounds per day ROG, 100 pounds per day NO_x, 550 pounds per day CO, 150 pounds per day SO_x, 150 pounds per day PM_{10}, and 55 pounds per day $PM_{2.5}$ during the construction phase.

The primary sources of operations phase emissions are the three stationary sources (i.e., thermal oxidizer, flare, and ICE), on-road vehicles traveling to and from the site buildings, and operational activities such as landscape equipment, consumer products, and energy use. As shown in Tables 3-7, the Project is estimated to generate less than the SCAQMD threshold of 55 pounds per day ROG, 55 pounds per day NO_x, 550 pounds per day CO, 150 pounds per day SO_x, 150 pounds per day PM_{10}, and 55 pounds per day $PM_{2.5}$ during the operational phase.

The proposed Project site is 4.24 acres in SRA Zone 19 – Saddleback Valley. As a conservative estimate, the 2-acre screening lookup tables were used to evaluate NO_x, CO, PM_{10}, and $PM_{2.5}$ impacts on nearby receptors. The nearest receptor is approximately 1,300

meters (4,200 feet) away from the proposed RNG facility. Therefore, the impact evaluation was performed using the closest distance within SCAQMD LST tables of 500 meters for construction. (SCAQMD 2008a). As shown in in Table 3-8, on-site emissions from construction would meet the LST passing criteria at the nearest receptors (500 meters).

Additionally, the AQIA conducted shows that operational activities would not cause an exceedance of the NO_2, SO_2, or CO NAAQS or CAAQS. Furthermore, the model-predicted PM_{10} and $PM_{2.5}$ concentrations from the operational sources would not exceed the 24-hour and annual significant change thresholds (see Table 4-12). Thus, the proposed Project would not cause a violation of the NAAQS or CAAQS or contribute substantially to an existing air quality violation, and therefore, the proposed Project would have a less than significant impact on air quality.

SCAQMD Guidance

The SCAQMD's 2003 guidance on addressing cumulative impacts for air quality is as follows: "As Lead Agency, the SCAQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR [Environmental Impact Report]. […] Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant" (SCAQMD 2003).

CEQA Guidelines

As referenced above, the SCAQMD cumulative air quality significance thresholds are the same as the project-specific air quality significance thresholds. Because the criteria pollutant mass emissions impacts shown in Tables 3-3 through 3-6 would not be expected to exceed any of the SCAQMD air quality significance thresholds, cumulative air quality impacts from comparable development projects would also be expected to be less than significant. Therefore, potential adverse impacts from implementing the proposed Project would not be "cumulatively considerable" as defined by CEQA Guidelines Section 15064(h)(1) for air quality impacts. Per CEQA Guidelines Section 15064(h)(4), the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed Project's incremental effects would be cumulatively considerable.

As shown in Tables 3-6 through 3-8 and Table 4-12, the proposed Project would result in a less than significant impact related to regional emissions, and no mitigation is required.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. A significant impact would occur if the proposed Project were to expose sensitive receptors to pollutant concentrations. The SCAQMD identifies the following as sensitive receptors: long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, and athletic facilities. There are residential land uses approximately 0.87 mile west of the Project site. The Project would be subject to grading and construction standards to mitigate air pollution and dust impacts. As demonstrated by the HRA results presented in Section 4.0, the Project is not expected to substantially contribute to pollutant

concentrations or expose surrounding residences and other sensitive receptors during construction or operation. The Project is required to meet SCAQMD Rule 403 requirements for controlling fugitive dust, as well as the City's requirements for grading and construction related to air pollution. Therefore, construction and operation of the Project would result in a less than significant impact for both localized and regional air pollution emissions, and no mitigation is required.

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

Less Than Significant Impact. Potential sources that may emit odors during construction activities include equipment exhaust and architectural coatings. Odors from these sources would be localized and generally confined to the immediate area surrounding the Project site. The proposed Project would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. Construction of the proposed Project would not cause an odor nuisance. The proposed RNG facility would not create odors because the LFG is being processed and compressed for shipment in the SoCalGas pipeline, and not released into the air. The byproducts of the treatment would be combusted at high temperatures just as it is currently being combusted in the existing flare station. The maintenance work on site also would not generate any significant odor. Therefore, the proposed Project would result in a less than significant impact related to objectionable odors, and no mitigation is required.

5.2 Mitigation Measures

None required.

6.0 ANALYSIS OF GREENHOUSE GAS EMISSIONS SIGNIFICANCE CRITERIA

This technical report contains details of the interrelated air quality and GHG studies. As shown in Table 3-11, GHG emissions would be below the GHG significance threshold for industrial projects.

6.1 Environmental Determination

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

Less Than Significant Impact. Using CalEEMod, direct on-site and off-site GHG emissions were estimated for construction and operation, and indirect off-site GHG emissions were estimated to account for electric power used by the proposed Project, water conveyance, and solid waste disposal. In addition, stationary source emission calculations were performed for the RNG thermal oxidizer and the RNG flare, as well as emergency generator usage. All CO_2 derived from LFG is considered biogenic (i.e., are part of the natural biological/physical carbon cycle) and does not result in a net increase in atmospheric CO_2. Therefore, for the tail gas streams, only the combustion byproducts of CH_4 and N_2O (i.e., anthropogenic GHGs) are included in this analysis.

The SCAQMD has officially adopted an industrial facility mass emissions threshold of 10,000 MT CO_2e per year (SCAQMD 2023).

Table 3-11 shows the incremental GHG emissions and evaluates them against SCAQMD significance thresholds. Operational measures incorporate typical code-required energy and water conservation features. Off-site traffic impacts are included in these emissions estimates, along with construction emissions amortized over 30 years.

The proposed project would provide a beneficial use and as shown in Table 3-11, incremental GHG emissions would be below the proposed GHG significance threshold for land use projects. Thus, impacts would be less than significant.

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

Less Than Significant Impact. The California legislature passed Senate Bill (SB) 375 to connect regional transportation planning to land use decisions made at a local level. SB 375 requires the metropolitan planning organizations (MPOs) to prepare a Sustainable Communities Strategy (SCS) in their RTPs to achieve the per capita GHG reduction targets. For the SCAG region, the SCS is contained in the 2024-2050 RTP/SCS. The 2024-2050 RTP/SCS focuses the majority of new housing and job growth in high-quality transit areas and other opportunity areas on existing main streets, downtowns, and commercial corridors, resulting in an improved jobs-housing balance and more opportunity for transit-oriented development (SCAG 2024). In addition, SB 743, adopted September 27, 2013, encourages land use and transportation planning decisions and investments that reduce vehicle miles traveled that contribute to GHG emissions, as required by AB 32. The proposed Project would not interfere with SCAG's ability to implement the regional strategies outlined in the 2024-2050 RTP/SCS. As such, impacts would be less than significant, and no mitigation is required.

6.2 Mitigation Measures

None required.

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APPENDIX A – CALEEMOD OUTPUTS

Bowerman Power LFG, LLC (BP) - RNG Plant 9-5-2024 Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Bowerman Power LFG, LLC (BP) - RNG Plant 9-5-2024
Construction Start Date	2/12/2025
Operational Year	2027
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	4.20
Location	33.71669152511946, -117.70992361946648
County	Orange
City	—
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5930
EDFZ	7
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.28

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
General Office Building	2.67	1000sqft	0.06	2,670	0.00	—	—	—

General Heavy Industry	22.0	1000sqft	0.51	22,045	0.00	—	—	—
Other Asphalt Surfaces	23.2	1000sqft	0.53	0.00	0.00	—	—	—
User Defined Linear	2.40	Mile	0.00	0.00	0.00	—	—	—
Other Non-Asphalt Surfaces	137	1000sqft	3.14	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-10-A	Water Exposed Surfaces
Construction	C-10-C	Water Unpaved Construction Roads
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Construction	C-12	Sweep Paved Roads
Construction	C-13	Use Low-VOC Paints for Construction
Area Sources	AS-1	Use Low-VOC Cleaning Supplies
Area Sources	AS-2	Use Low-VOC Paints

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	20.2	56.8	50.0	0.16	2.02	78.2	80.2	1.87	14.6	16.5	—	20,908	20,908	1.33	2.13	30.0	21,607
Mit.	11.1	56.8	50.0	0.16	2.02	22.9	24.9	1.87	4.58	6.46	—	20,908	20,908	1.33	2.13	30.0	21,607
% Reduced	45%	—	—	—	—	71%	69%	—	69%	61%	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	20.2	40.1	31.0	0.13	1.37	64.8	65.8	1.26	10.2	11.4	—	17,147	17,147	1.18	2.07	0.74	17,794
Mit.	11.1	40.1	31.0	0.13	1.37	16.8	17.9	1.26	2.68	3.94	—	17,147	17,147	1.18	2.07	0.74	17,794
% Reduced	45%	—	—	—	—	74%	73%	—	74%	66%	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.14	20.4	20.7	0.05	0.81	36.9	37.7	0.74	5.69	6.44	—	5,682	5,682	0.29	0.33	2.18	5,791
Mit.	2.14	20.4	20.7	0.05	0.81	9.90	10.7	0.74	1.60	2.35	—	5,682	5,682	0.29	0.33	2.18	5,791
% Reduced	—	—	—	—	—	73%	72%	—	72%	64%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.39	3.72	3.77	0.01	0.15	6.73	6.87	0.14	1.04	1.17	—	941	941	0.05	0.06	0.36	959
Mit.	0.39	3.72	3.77	0.01	0.15	1.81	1.95	0.14	0.29	0.43	—	941	941	0.05	0.06	0.36	959
% Reduced	—	—	—	—	—	73%	72%	—	72%	64%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	5.46	56.8	50.0	0.16	2.02	78.2	80.2	1.87	14.6	16.5	—	20,908	20,908	1.33	2.13	30.0	21,607
2026	20.2	17.0	20.5	0.03	0.70	64.6	65.3	0.64	8.54	9.18	—	3,942	3,942	0.15	0.07	1.61	3,967
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2025	3.51	40.1	31.0	0.13	1.37	64.7	65.8	1.26	10.2	11.4	—	17,147	17,147	1.18	2.07	0.74	17,794
2026	20.2	22.4	28.6	0.04	0.94	64.8	65.7	0.86	8.58	9.44	—	5,314	5,314	0.21	0.08	0.06	5,343
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	2.14	20.4	20.7	0.05	0.81	36.9	37.7	0.74	5.69	6.44	—	5,682	5,682	0.29	0.33	2.18	5,791
2026	1.44	5.98	7.15	0.01	0.25	22.8	23.0	0.23	3.02	3.25	—	1,413	1,413	0.06	0.03	0.26	1,422
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.39	3.72	3.77	0.01	0.15	6.73	6.87	0.14	1.04	1.17	—	941	941	0.05	0.06	0.36	959
2026	0.26	1.09	1.31	< 0.005	0.05	4.15	4.20	0.04	0.55	0.59	—	234	234	0.01	< 0.005	0.04	236

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	5.46	56.8	50.0	0.16	2.02	22.9	24.9	1.87	4.58	6.46	—	20,908	20,908	1.33	2.13	30.0	21,607
2026	11.1	17.0	20.5	0.03	0.70	16.6	17.3	0.64	2.24	2.88	—	3,942	3,942	0.15	0.07	1.61	3,967
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.51	40.1	31.0	0.13	1.37	16.7	17.9	1.26	2.68	3.94	—	17,147	17,147	1.18	2.07	0.74	17,794
2026	11.1	22.4	28.6	0.04	0.94	16.8	17.7	0.86	2.28	3.14	—	5,314	5,314	0.21	0.08	0.06	5,343
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	2.14	20.4	20.7	0.05	0.81	9.90	10.7	0.74	1.60	2.35	—	5,682	5,682	0.29	0.33	2.18	5,791
2026	1.06	5.98	7.15	0.01	0.25	5.86	6.11	0.23	0.79	1.02	—	1,413	1,413	0.06	0.03	0.26	1,422
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.39	3.72	3.77	0.01	0.15	1.81	1.95	0.14	0.29	0.43	—	941	941	0.05	0.06	0.36	959
2026	0.19	1.09	1.31	< 0.005	0.05	1.07	1.11	0.04	0.14	0.19	—	234	234	0.01	< 0.005	0.04	236

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.29	26.4	60.7	124	5.26	0.10	5.36	5.26	0.02	5.29	26.7	50,688	50,714	4.36	0.20	6.16	50,888
Mit.	5.21	26.4	60.7	124	5.26	0.10	5.36	5.26	0.02	5.29	26.7	50,688	50,714	4.36	0.20	6.16	50,888
% Reduced	1%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.11	26.4	59.6	124	5.26	0.10	5.36	5.26	0.02	5.29	26.7	50,680	50,706	4.36	0.20	5.76	50,880
Mit.	5.04	26.4	59.6	124	5.26	0.10	5.36	5.26	0.02	5.29	26.7	50,680	50,706	4.36	0.20	5.76	50,880
% Reduced	2%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.12	25.8	59.2	87.8	5.19	0.10	5.29	5.19	0.02	5.21	26.7	50,675	50,702	4.47	0.36	5.92	50,928
Mit.	5.05	25.8	59.2	87.8	5.19	0.10	5.29	5.19	0.02	5.21	26.7	50,675	50,702	4.47	0.36	5.92	50,928
% Reduced	2%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.93	4.71	10.8	16.0	0.95	0.02	0.96	0.95	< 0.005	0.95	4.43	8,390	8,394	0.74	0.06	0.98	8,432
Mit.	0.92	4.71	10.8	16.0	0.95	0.02	0.96	0.95	< 0.005	0.95	4.43	8,390	8,394	0.74	0.06	0.98	8,432
% Reduced	2%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.02	0.04	0.29	< 0.005	< 0.005	0.10	0.10	< 0.005	0.02	0.03	—	110	110	< 0.005	< 0.005	0.42	112
Area	0.79	0.01	1.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.42	4.42	< 0.005	< 0.005	—	4.44
Energy	0.01	0.27	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	—	702	702	0.05	< 0.005	—	704
Water	—	—	—	—	—	—	—	—	—	—	10.7	55.3	66.0	1.10	0.03	—	101
Waste	—	—	—	—	—	—	—	—	—	—	16.1	0.00	16.1	1.61	0.00	—	56.2
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
User-Defined	4.46	26.1	59.1	124	5.24	—	5.24	5.24	—	5.24	—	49,816	49,816	1.60	0.16	—	49,904
Total	5.29	26.4	60.7	124	5.26	0.10	5.36	5.26	0.02	5.29	26.7	50,688	50,714	4.36	0.20	6.16	50,888
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.02	0.04	0.26	< 0.005	< 0.005	0.10	0.10	< 0.005	0.02	0.03	—	106	106	< 0.005	0.01	0.01	108
Area	0.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.01	0.27	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	—	702	702	0.05	< 0.005	—	704
Water	—	—	—	—	—	—	—	—	—	—	10.7	55.3	66.0	1.10	0.03	—	101
Waste	—	—	—	—	—	—	—	—	—	—	16.1	0.00	16.1	1.61	0.00	—	56.2
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
User-Defined	4.46	26.1	59.1	124	5.24	—	5.24	5.24	—	5.24	—	49,816	49,816	1.60	0.16	—	49,904
Total	5.11	26.4	59.6	124	5.26	0.10	5.36	5.26	0.02	5.29	26.7	50,680	50,706	4.36	0.20	5.76	50,880
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.02	0.04	0.26	< 0.005	< 0.005	0.10	0.10	< 0.005	0.02	0.03	—	107	107	< 0.005	0.01	0.18	109

Area	0.74	0.01	0.74	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.03	3.03	< 0.005	< 0.005	—	3.04
Energy	0.01	0.27	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	—	702	702	0.05	< 0.005	—	704
Water	—	—	—	—	—	—	—	—	—	—	10.7	55.3	66.0	1.10	0.03	—	101
Waste	—	—	—	—	—	—	—	—	—	—	16.1	0.00	16.1	1.61	0.00	—	56.2
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
User-Defined	4.35	25.5	58.0	87.8	5.17	—	5.17	5.17	—	5.17	—	49,808	49,808	1.72	0.33	—	49,949
Total	5.12	25.8	59.2	87.8	5.19	0.10	5.29	5.19	0.02	5.21	26.7	50,675	50,702	4.47	0.36	5.92	50,928
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	< 0.005	0.01	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	17.8	17.8	< 0.005	< 0.005	0.03	18.1
Area	0.13	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.50	0.50	< 0.005	< 0.005	—	0.50
Energy	< 0.005	0.05	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	116	116	0.01	< 0.005	—	117
Water	—	—	—	—	—	—	—	—	—	—	1.77	9.15	10.9	0.18	< 0.005	—	16.8
Waste	—	—	—	—	—	—	—	—	—	—	2.66	0.00	2.66	0.27	0.00	—	9.31
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.95	0.95
User-Defined	0.79	4.65	10.6	16.0	0.94	—	0.94	0.94	—	0.94	—	8,246	8,246	0.28	0.05	—	8,270
Total	0.93	4.71	10.8	16.0	0.95	0.02	0.96	0.95	< 0.005	0.95	4.43	8,390	8,394	0.74	0.06	0.98	8,432

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.02	0.04	0.29	< 0.005	< 0.005	0.10	0.10	< 0.005	0.02	0.03	—	110	110	< 0.005	< 0.005	0.42	112
Area	0.72	0.01	1.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.42	4.42	< 0.005	< 0.005	—	4.44
Energy	0.01	0.27	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	—	702	702	0.05	< 0.005	—	704
Water	—	—	—	—	—	—	—	—	—	—	10.7	55.3	66.0	1.10	0.03	—	101

Waste	—	—	—	—	—	—	—	—	—	—	16.1	0.00	16.1	1.61	0.00	—	56.2
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
User-Defined	4.46	26.1	59.1	124	5.24	—	5.24	5.24	—	5.24	—	49,816	49,816	1.60	0.16	—	49,904
Total	5.21	26.4	60.7	124	5.26	0.10	5.36	5.26	0.02	5.29	26.7	50,688	50,714	4.36	0.20	6.16	50,888
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.02	0.04	0.26	< 0.005	< 0.005	0.10	0.10	< 0.005	0.02	0.03	—	106	106	< 0.005	0.01	0.01	108
Area	0.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.01	0.27	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	—	702	702	0.05	< 0.005	—	704
Water	—	—	—	—	—	—	—	—	—	—	10.7	55.3	66.0	1.10	0.03	—	101
Waste	—	—	—	—	—	—	—	—	—	—	16.1	0.00	16.1	1.61	0.00	—	56.2
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
User-Defined	4.46	26.1	59.1	124	5.24	—	5.24	5.24	—	5.24	—	49,816	49,816	1.60	0.16	—	49,904
Total	5.04	26.4	59.6	124	5.26	0.10	5.36	5.26	0.02	5.29	26.7	50,680	50,706	4.36	0.20	5.76	50,880
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.02	0.04	0.26	< 0.005	< 0.005	0.10	0.10	< 0.005	0.02	0.03	—	107	107	< 0.005	0.01	0.18	109
Area	0.66	0.01	0.74	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.03	3.03	< 0.005	< 0.005	—	3.04
Energy	0.01	0.27	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	—	702	702	0.05	< 0.005	—	704
Water	—	—	—	—	—	—	—	—	—	—	10.7	55.3	66.0	1.10	0.03	—	101
Waste	—	—	—	—	—	—	—	—	—	—	16.1	0.00	16.1	1.61	0.00	—	56.2
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
User-Defined	4.35	25.5	58.0	87.8	5.17	—	5.17	5.17	—	5.17	—	49,808	49,808	1.72	0.33	—	49,949
Total	5.05	25.8	59.2	87.8	5.19	0.10	5.29	5.19	0.02	5.21	26.7	50,675	50,702	4.47	0.36	5.92	50,928
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	< 0.005	0.01	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	17.8	17.8	< 0.005	< 0.005	0.03	18.1
Area	0.12	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.50	0.50	< 0.005	< 0.005	—	0.50

Energy	< 0.005	0.05	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	116	116	0.01	< 0.005	—	117
Water	—	—	—	—	—	—	—	—	—	—	1.77	9.15	10.9	0.18	< 0.005	—	16.8
Waste	—	—	—	—	—	—	—	—	—	—	2.66	0.00	2.66	0.27	0.00	—	9.31
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.95	0.95
User-Defined	0.79	4.65	10.6	16.0	0.94	—	0.94	0.94	—	0.94	—	8,246	8,246	0.28	0.05	—	8,270
Total	0.92	4.71	10.8	16.0	0.95	0.02	0.96	0.95	< 0.005	0.95	4.43	8,390	8,394	0.74	0.06	0.98	8,432

3. Construction Emissions Details

3.1. Earthworks A (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.95	0.91	< 0.005	0.04	—	0.04	0.04	—	0.04	—	160	160	0.01	< 0.005	—	160

Dust From Material Movement	—	—	—	—	—	0.59	0.59	—	0.30	0.30	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.17	0.17	< 0.005	0.01	—	0.01	0.01	—	0.01	—	26.4	26.4	< 0.005	< 0.005	—	26.5
Dust From Material Movement	—	—	—	—	—	0.11	0.11	—	0.06	0.06	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.07	0.85	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	221	221	< 0.005	0.01	0.02	224
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.75	6.75	< 0.005	< 0.005	0.01	6.84
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.12	1.12	< 0.005	< 0.005	< 0.005	1.13
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.2. Earthworks A (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	5.11	5.11	—	2.63	2.63	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.95	0.91	< 0.005	0.04	—	0.04	0.04	—	0.04	—	160	160	0.01	< 0.005	—	160
Dust From Material Movement	—	—	—	—	—	0.15	0.15	—	0.08	0.08	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.17	0.17	< 0.005	0.01	—	0.01	0.01	—	0.01	—	26.4	26.4	< 0.005	< 0.005	—	26.5
Dust From Material Movement	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.07	0.85	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	221	221	< 0.005	0.01	0.02	224
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.75	6.75	< 0.005	< 0.005	0.01	6.84
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.12	1.12	< 0.005	< 0.005	< 0.005	1.13
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Earthworks B (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.10	24.2	21.3	0.05	1.12	—	1.12	1.03	—	1.03	—	4,121	4,121	0.17	0.03	—	4,135

Dust From Material Movement	—	—	—	—	—	9.90	9.90	—	5.06	5.06	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.10	24.2	21.3	0.05	1.12	—	1.12	1.03	—	1.03	—	4,121	4,121	0.17	0.03	—	4,135
Dust From Material Movement	—	—	—	—	—	9.90	9.90	—	5.06	5.06	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.42	3.25	2.86	0.01	0.15	—	0.15	0.14	—	0.14	—	553	553	0.02	< 0.005	—	555
Dust From Material Movement	—	—	—	—	—	1.33	1.33	—	0.68	0.68	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.59	0.52	< 0.005	0.03	—	0.03	0.03	—	0.03	—	91.6	91.6	< 0.005	< 0.005	—	91.9
Dust From Material Movement	—	—	—	—	—	0.24	0.24	—	0.12	0.12	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.16	0.16	2.52	0.00	0.00	0.59	0.59	0.00	0.14	0.14	—	597	597	0.01	0.02	2.26	606
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.26	15.1	6.70	0.08	0.16	3.23	3.39	0.16	0.91	1.06	—	12,454	12,454	1.01	2.02	26.2	13,106
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.16	0.18	2.18	0.00	0.00	0.59	0.59	0.00	0.14	0.14	—	568	568	0.01	0.02	0.06	575
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.25	15.7	6.76	0.08	0.16	3.23	3.39	0.16	0.91	1.06	—	12,458	12,458	1.01	2.02	0.68	13,084
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.31	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	77.4	77.4	< 0.005	< 0.005	0.13	78.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.03	2.13	0.90	0.01	0.02	0.43	0.45	0.02	0.12	0.14	—	1,672	1,672	0.14	0.27	1.53	1,758
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.8	12.8	< 0.005	< 0.005	0.02	13.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.39	0.16	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	277	277	0.02	0.04	0.25	291

3.4. Earthworks B (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.10	24.2	21.3	0.05	1.12	—	1.12	1.03	—	1.03	—	4,121	4,121	0.17	0.03	—	4,135

Dust From Material Movement	—	—	—	—	—	2.57	2.57	—	1.32	1.32	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.10	24.2	21.3	0.05	1.12	—	1.12	1.03	—	1.03	—	4,121	4,121	0.17	0.03	—	4,135
Dust From Material Movement	—	—	—	—	—	2.57	2.57	—	1.32	1.32	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.42	3.25	2.86	0.01	0.15	—	0.15	0.14	—	0.14	—	553	553	0.02	< 0.005	—	555
Dust From Material Movement	—	—	—	—	—	0.35	0.35	—	0.18	0.18	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.59	0.52	< 0.005	0.03	—	0.03	0.03	—	0.03	—	91.6	91.6	< 0.005	< 0.005	—	91.9
Dust From Material Movement	—	—	—	—	—	0.06	0.06	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.16	0.16	2.52	0.00	0.00	0.59	0.59	0.00	0.14	0.14	—	597	597	0.01	0.02	2.26	606
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.26	15.1	6.70	0.08	0.16	3.23	3.39	0.16	0.91	1.06	—	12,454	12,454	1.01	2.02	26.2	13,106
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.16	0.18	2.18	0.00	0.00	0.59	0.59	0.00	0.14	0.14	—	568	568	0.01	0.02	0.06	575
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.25	15.7	6.76	0.08	0.16	3.23	3.39	0.16	0.91	1.06	—	12,458	12,458	1.01	2.02	0.68	13,084
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.31	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	77.4	77.4	< 0.005	< 0.005	0.13	78.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.03	2.13	0.90	0.01	0.02	0.43	0.45	0.02	0.12	0.14	—	1,672	1,672	0.14	0.27	1.53	1,758
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.8	12.8	< 0.005	< 0.005	0.02	13.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.39	0.16	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	277	277	0.02	0.04	0.25	291

3.5. Building Construction A (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.14	10.3	11.1	0.02	0.43	—	0.43	0.40	—	0.40	—	2,436	2,436	0.10	0.02	—	2,444

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.14	10.3	11.1	0.02	0.43	—	0.43	0.40	—	0.40	—	2,436	2,436	0.10	0.02	—	2,444
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.51	4.60	4.96	0.01	0.19	—	0.19	0.18	—	0.18	—	1,088	1,088	0.04	0.01	—	1,091
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.84	0.91	< 0.005	0.04	—	0.04	0.03	—	0.03	—	180	180	0.01	< 0.005	—	181
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.57	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	134	134	< 0.005	< 0.005	0.51	136
Vendor	< 0.005	0.13	0.07	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	129	129	0.01	0.02	0.35	135
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.49	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	128	128	< 0.005	< 0.005	0.01	129
Vendor	< 0.005	0.14	0.07	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	129	129	0.01	0.02	0.01	135
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.23	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	57.8	57.8	< 0.005	< 0.005	0.10	58.6
Vendor	< 0.005	0.06	0.03	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	57.7	57.7	< 0.005	0.01	0.07	60.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.58	9.58	< 0.005	< 0.005	0.02	9.70
Vendor	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.55	9.55	< 0.005	< 0.005	0.01	9.97
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.6. Building Construction A (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.14	10.3	11.1	0.02	0.43	—	0.43	0.40	—	0.40	—	2,436	2,436	0.10	0.02	—	2,444
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.14	10.3	11.1	0.02	0.43	—	0.43	0.40	—	0.40	—	2,436	2,436	0.10	0.02	—	2,444
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.51	4.60	4.96	0.01	0.19	—	0.19	0.18	—	0.18	—	1,088	1,088	0.04	0.01	—	1,091

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.84	0.91	< 0.005	0.04	—	0.04	0.03	—	0.03	—	180	180	0.01	< 0.005	—	181
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.57	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	134	134	< 0.005	< 0.005	0.51	136
Vendor	< 0.005	0.13	0.07	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	129	129	0.01	0.02	0.35	135
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.49	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	128	128	< 0.005	< 0.005	0.01	129
Vendor	< 0.005	0.14	0.07	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	129	129	0.01	0.02	0.01	135
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.23	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	57.8	57.8	< 0.005	< 0.005	0.10	58.6
Vendor	< 0.005	0.06	0.03	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	57.7	57.7	< 0.005	0.01	0.07	60.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.58	9.58	< 0.005	< 0.005	0.02	9.70
Vendor	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.55	9.55	< 0.005	< 0.005	0.01	9.97
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction B (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.49	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	128	128	< 0.005	< 0.005	0.01	129
Vendor	< 0.005	0.14	0.07	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	129	129	0.01	0.02	0.01	135
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.28	2.28	< 0.005	< 0.005	< 0.005	2.31
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.28	2.28	< 0.005	< 0.005	< 0.005	2.38
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.38	0.38	< 0.005	< 0.005	< 0.005	0.38
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.38	0.38	< 0.005	< 0.005	< 0.005	0.39
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Building Construction B (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.49	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	128	128	< 0.005	< 0.005	0.01	129

Vendor	< 0.005	0.14	0.07	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	129	129	0.01	0.02	0.01	135
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.28	2.28	< 0.005	< 0.005	< 0.005	2.31
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.28	2.28	< 0.005	< 0.005	< 0.005	2.38
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.38	0.38	< 0.005	< 0.005	< 0.005	0.38
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.38	0.38	< 0.005	< 0.005	< 0.005	0.39
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction B (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.46	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	125	125	< 0.005	< 0.005	0.01	127
Vendor	< 0.005	0.13	0.07	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	127	127	0.01	0.02	0.01	133
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.49	1.49	< 0.005	< 0.005	< 0.005	1.51
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.49	1.49	< 0.005	< 0.005	< 0.005	1.56
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.25	0.25	< 0.005	< 0.005	< 0.005	0.25
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.25	0.25	< 0.005	< 0.005	< 0.005	0.26
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction B (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.46	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	125	125	< 0.005	< 0.005	0.01	127
Vendor	< 0.005	0.13	0.07	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	127	127	0.01	0.02	0.01	133
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.49	1.49	< 0.005	< 0.005	< 0.005	1.51
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.49	1.49	< 0.005	< 0.005	< 0.005	1.56
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.25	0.25	< 0.005	< 0.005	< 0.005	0.25
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.25	0.25	< 0.005	< 0.005	< 0.005	0.26
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Building Construction C (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.46	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	125	125	< 0.005	< 0.005	0.01	127
Vendor	< 0.005	0.13	0.07	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	127	127	0.01	0.02	0.01	133
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	14.3	14.3	< 0.005	< 0.005	0.02	14.5
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.3	14.3	< 0.005	< 0.005	0.02	14.9
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.36	2.36	< 0.005	< 0.005	< 0.005	2.39
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.36	2.36	< 0.005	< 0.005	< 0.005	2.47

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.12. Building Construction C (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.46	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	125	125	< 0.005	< 0.005	0.01	127
Vendor	< 0.005	0.13	0.07	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	127	127	0.01	0.02	0.01	133
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	14.3	14.3	< 0.005	< 0.005	0.02	14.5
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.3	14.3	< 0.005	< 0.005	0.02	14.9
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.36	2.36	< 0.005	< 0.005	< 0.005	2.39
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.36	2.36	< 0.005	< 0.005	< 0.005	2.47
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Paving (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.68	6.23	8.81	0.01	0.26	—	0.26	0.24	—	0.24	—	1,350	1,350	0.05	0.01	—	1,355
Paving	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.19	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	40.7	40.7	< 0.005	< 0.005	—	40.8
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	< 0.005	0.03	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.74	6.74	< 0.005	< 0.005	—	6.76
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.91	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	248	248	< 0.005	0.01	0.02	251
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.57	7.57	< 0.005	< 0.005	0.01	7.67
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.25	1.25	< 0.005	< 0.005	< 0.005	1.27
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.14. Paving (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.68	6.23	8.81	0.01	0.26	—	0.26	0.24	—	0.24	—	1,350	1,350	0.05	0.01	—	1,355
Paving	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.19	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	40.7	40.7	< 0.005	< 0.005	—	40.8
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.03	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.74	6.74	< 0.005	< 0.005	—	6.76
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.91	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	248	248	< 0.005	0.01	0.02	251
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.57	7.57	< 0.005	< 0.005	0.01	7.67
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.25	1.25	< 0.005	< 0.005	< 0.005	1.27
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	18.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	18.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.49	5.49	< 0.005	< 0.005	—	5.51
Architectural Coatings	0.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.91	0.91	< 0.005	< 0.005	—	0.91
Architectural Coatings	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.32	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	79.0	79.0	< 0.005	< 0.005	0.27	80.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.28	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	75.2	75.2	< 0.005	< 0.005	0.01	76.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.13	3.13	< 0.005	< 0.005	< 0.005	3.17
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.52	0.52	< 0.005	< 0.005	< 0.005	0.53
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.16. Architectural Coating (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	9.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	9.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.49	5.49	< 0.005	< 0.005	—	5.51
Architectural Coatings	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.91	0.91	< 0.005	< 0.005	—	0.91
Architectural Coatings	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.32	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	79.0	79.0	< 0.005	< 0.005	0.27	80.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.28	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	75.2	75.2	< 0.005	< 0.005	0.01	76.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.13	3.13	< 0.005	< 0.005	< 0.005	3.17
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.52	0.52	< 0.005	< 0.005	< 0.005	0.53
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.17. SoCalGas Pipeline Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.85	17.0	18.2	0.03	0.74	—	0.74	0.68	—	0.68	—	3,280	3,280	0.13	0.03	—	3,291
Dust From Material Movement	—	—	—	—	—	5.31	5.31	—	2.57	2.57	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.17	0.08	< 0.005	< 0.005	58.9	58.9	< 0.005	5.88	5.88	—	139	139	0.01	0.02	0.29	147
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.85	17.0	18.2	0.03	0.74	—	0.74	0.68	—	0.68	—	3,280	3,280	0.13	0.03	—	3,291
Dust From Material Movement	—	—	—	—	—	5.31	5.31	—	2.57	2.57	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.18	0.08	< 0.005	< 0.005	58.9	58.9	< 0.005	5.88	5.88	—	140	140	0.01	0.02	0.01	147
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.99	9.17	9.78	0.02	0.40	—	0.40	0.37	—	0.37	—	1,765	1,765	0.07	0.01	—	1,771
Dust From Material Movement	—	—	—	—	—	2.86	2.86	—	1.38	1.38	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.10	0.04	< 0.005	< 0.005	31.3	31.3	< 0.005	3.13	3.13	—	75.1	75.1	0.01	0.01	0.07	78.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	1.67	1.78	< 0.005	0.07	—	0.07	0.07	—	0.07	—	292	292	0.01	< 0.005	—	293
Dust From Material Movement	—	—	—	—	—	0.52	0.52	—	0.25	0.25	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	5.72	5.72	< 0.005	0.57	0.57	—	12.4	12.4	< 0.005	< 0.005	0.01	13.1
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	1.26	0.00	0.00	0.29	0.29	0.00	0.07	0.07	—	299	299	< 0.005	0.01	1.13	303
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.8	18.8	< 0.005	< 0.005	0.04	19.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.09	1.09	0.00	0.00	0.29	0.29	0.00	0.07	0.07	—	284	284	< 0.005	0.01	0.03	288
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.8	18.8	< 0.005	< 0.005	< 0.005	19.7
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.05	0.61	0.00	0.00	0.16	0.16	0.00	0.04	0.04	—	155	155	< 0.005	0.01	0.26	157
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.11	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	25.7	25.7	< 0.005	< 0.005	0.04	26.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.67	1.67	< 0.005	< 0.005	< 0.005	1.76

3.18. SoCalGas Pipeline Construction (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.85	17.0	18.2	0.03	0.74	—	0.74	0.68	—	0.68	—	3,280	3,280	0.13	0.03	—	3,291
Dust From Material Movement	—	—	—	—	—	1.38	1.38	—	0.67	0.67	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.17	0.08	< 0.005	< 0.005	14.8	14.8	< 0.005	1.48	1.49	—	139	139	0.01	0.02	0.29	147
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.85	17.0	18.2	0.03	0.74	—	0.74	0.68	—	0.68	—	3,280	3,280	0.13	0.03	—	3,291
Dust From Material Movement	—	—	—	—	—	1.38	1.38	—	0.67	0.67	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.18	0.08	< 0.005	< 0.005	14.8	14.8	< 0.005	1.48	1.49	—	140	140	0.01	0.02	0.01	147
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.99	9.17	9.78	0.02	0.40	—	0.40	0.37	—	0.37	—	1,765	1,765	0.07	0.01	—	1,771
Dust From Material Movement	—	—	—	—	—	0.74	0.74	—	0.36	0.36	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.10	0.04	< 0.005	< 0.005	7.90	7.90	< 0.005	0.79	0.79	—	75.1	75.1	0.01	0.01	0.07	78.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	1.67	1.78	< 0.005	0.07	—	0.07	0.07	—	0.07	—	292	292	0.01	< 0.005	—	293
Dust From Material Movement	—	—	—	—	—	0.14	0.14	—	0.07	0.07	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	1.44	1.44	< 0.005	0.14	0.14	—	12.4	12.4	< 0.005	< 0.005	0.01	13.1
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	1.26	0.00	0.00	0.29	0.29	0.00	0.07	0.07	—	299	299	< 0.005	0.01	1.13	303
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.8	18.8	< 0.005	< 0.005	0.04	19.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.09	1.09	0.00	0.00	0.29	0.29	0.00	0.07	0.07	—	284	284	< 0.005	0.01	0.03	288
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.8	18.8	< 0.005	< 0.005	< 0.005	19.7
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.05	0.61	0.00	0.00	0.16	0.16	0.00	0.04	0.04	—	155	155	< 0.005	0.01	0.26	157
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.11	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	25.7	25.7	< 0.005	< 0.005	0.04	26.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.67	1.67	< 0.005	< 0.005	< 0.005	1.76

3.19. SoCalGas Pipeline Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.75	15.8	17.8	0.03	0.67	—	0.67	0.62	—	0.62	—	3,281	3,281	0.13	0.03	—	3,293
Dust From Material Movement	—	—	—	—	—	5.31	5.31	—	2.57	2.57	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.16	0.07	< 0.005	< 0.005	58.9	58.9	< 0.005	5.88	5.88	—	137	137	0.01	0.02	0.28	144
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.75	15.8	17.8	0.03	0.67	—	0.67	0.62	—	0.62	—	3,281	3,281	0.13	0.03	—	3,293
Dust From Material Movement	—	—	—	—	—	5.31	5.31	—	2.57	2.57	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.17	0.07	< 0.005	< 0.005	58.9	58.9	< 0.005	5.88	5.88	—	137	137	0.01	0.02	0.01	144
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.62	5.64	6.32	0.01	0.24	—	0.24	0.22	—	0.22	—	1,169	1,169	0.05	0.01	—	1,173
Dust From Material Movement	—	—	—	—	—	1.89	1.89	—	0.91	0.91	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.06	0.03	< 0.005	< 0.005	20.7	20.7	< 0.005	2.07	2.07	—	48.8	48.8	< 0.005	0.01	0.04	51.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	1.03	1.15	< 0.005	0.04	—	0.04	0.04	—	0.04	—	193	193	0.01	< 0.005	—	194
Dust From Material Movement	—	—	—	—	—	0.35	0.35	—	0.17	0.17	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	< 0.005	< 0.005	3.78	3.78	< 0.005	0.38	0.38	—	8.08	8.08	< 0.005	< 0.005	0.01	8.49
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	1.19	0.00	0.00	0.29	0.29	0.00	0.07	0.07	—	293	293	< 0.005	0.01	1.02	297
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.4	18.4	< 0.005	< 0.005	0.04	19.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	1.02	0.00	0.00	0.29	0.29	0.00	0.07	0.07	—	279	279	< 0.005	0.01	0.03	282
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.4	18.4	< 0.005	< 0.005	< 0.005	19.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.38	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	101	101	< 0.005	< 0.005	0.16	102
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.57	6.57	< 0.005	< 0.005	0.01	6.90
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.7	16.7	< 0.005	< 0.005	0.03	16.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.09	1.09	< 0.005	< 0.005	< 0.005	1.14

3.20. SoCalGas Pipeline Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.75	15.8	17.8	0.03	0.67	—	0.67	0.62	—	0.62	—	3,281	3,281	0.13	0.03	—	3,293
Dust From Material Movement	—	—	—	—	—	1.38	1.38	—	0.67	0.67	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.16	0.07	< 0.005	< 0.005	14.8	14.8	< 0.005	1.48	1.49	—	137	137	0.01	0.02	0.28	144
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.75	15.8	17.8	0.03	0.67	—	0.67	0.62	—	0.62	—	3,281	3,281	0.13	0.03	—	3,293
Dust From Material Movement	—	—	—	—	—	1.38	1.38	—	0.67	0.67	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.17	0.07	< 0.005	< 0.005	14.8	14.8	< 0.005	1.48	1.49	—	137	137	0.01	0.02	0.01	144
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.62	5.64	6.32	0.01	0.24	—	0.24	0.22	—	0.22	—	1,169	1,169	0.05	0.01	—	1,173
Dust From Material Movement	—	—	—	—	—	0.49	0.49	—	0.24	0.24	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.06	0.03	< 0.005	< 0.005	5.23	5.23	< 0.005	0.52	0.52	—	48.8	48.8	< 0.005	0.01	0.04	51.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	1.03	1.15	< 0.005	0.04	—	0.04	0.04	—	0.04	—	193	193	0.01	< 0.005	—	194
Dust From Material Movement	—	—	—	—	—	0.09	0.09	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.95	0.95	< 0.005	0.10	0.10	—	8.08	8.08	< 0.005	< 0.005	0.01	8.49
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	1.19	0.00	0.00	0.29	0.29	0.00	0.07	0.07	—	293	293	< 0.005	0.01	1.02	297
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.4	18.4	< 0.005	< 0.005	0.04	19.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	1.02	0.00	0.00	0.29	0.29	0.00	0.07	0.07	—	279	279	< 0.005	0.01	0.03	282
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.4	18.4	< 0.005	< 0.005	< 0.005	19.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.38	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	101	101	< 0.005	< 0.005	0.16	102
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.57	6.57	< 0.005	< 0.005	0.01	6.90
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.7	16.7	< 0.005	< 0.005	0.03	16.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.09	1.09	< 0.005	< 0.005	< 0.005	1.14

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.02	0.01	0.25	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	70.2	70.2	< 0.005	< 0.005	0.22	70.9
General Heavy Industry	< 0.005	0.02	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	39.9	39.9	< 0.005	< 0.005	0.20	41.1
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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
Total	0.02	0.04	0.29	< 0.005	< 0.005	0.10	0.10	< 0.005	0.02	0.03	—	110	110	< 0.005	< 0.005	0.42	112
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	0.02	0.02	0.22	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	66.8	66.8	< 0.005	< 0.005	0.01	67.3
General Heavy Industry	< 0.005	0.02	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	39.7	39.7	< 0.005	< 0.005	0.01	40.7
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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
Total	0.02	0.04	0.26	< 0.005	< 0.005	0.10	0.10	< 0.005	0.02	0.03	—	106	106	< 0.005	0.01	0.01	108
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	< 0.005	< 0.005	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	11.2	11.2	< 0.005	< 0.005	0.02	11.3
General Heavy Industry	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.58	6.58	< 0.005	< 0.005	0.01	6.76
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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
Total	< 0.005	0.01	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	17.8	17.8	< 0.005	< 0.005	0.03	18.1

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	0.02	0.01	0.25	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	70.2	70.2	< 0.005	< 0.005	0.22	70.9
General Heavy Industry	< 0.005	0.02	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	39.9	39.9	< 0.005	< 0.005	0.20	41.1
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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
Total	0.02	0.04	0.29	< 0.005	< 0.005	0.10	0.10	< 0.005	0.02	0.03	—	110	110	< 0.005	< 0.005	0.42	112
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	0.02	0.02	0.22	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	66.8	66.8	< 0.005	< 0.005	0.01	67.3
General Heavy Industry	< 0.005	0.02	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	39.7	39.7	< 0.005	< 0.005	0.01	40.7
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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
Total	0.02	0.04	0.26	< 0.005	< 0.005	0.10	0.10	< 0.005	0.02	0.03	—	106	106	< 0.005	0.01	0.01	108
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	< 0.005	< 0.005	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	11.2	11.2	< 0.005	< 0.005	0.02	11.3
General Heavy Industry	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.58	6.58	< 0.005	< 0.005	0.01	6.76

Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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
Total	< 0.005	0.01	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	17.8	17.8	< 0.005	< 0.005	0.03	18.1

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	69.3	69.3	< 0.005	< 0.005	—	69.6
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	308	308	0.02	< 0.005	—	309
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	378	378	0.02	< 0.005	—	379
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	—	—	—	—	—	—	—	—	—	—	—	69.3	69.3	< 0.005	< 0.005	—	69.6
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	308	308	0.02	< 0.005	—	309
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	378	378	0.02	< 0.005	—	379
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	11.5	11.5	< 0.005	< 0.005	—	11.5
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	51.0	51.0	< 0.005	< 0.005	—	51.2
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	62.5	62.5	< 0.005	< 0.005	—	62.7

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	—	—	—	—	—	—	—	—	—	—	—	69.3	69.3	< 0.005	< 0.005	—	69.6
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	308	308	0.02	< 0.005	—	309
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	378	378	0.02	< 0.005	—	379
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	69.3	69.3	< 0.005	< 0.005	—	69.6
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	308	308	0.02	< 0.005	—	309
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	378	378	0.02	< 0.005	—	379
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	11.5	11.5	< 0.005	< 0.005	—	11.5
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	51.0	51.0	< 0.005	< 0.005	—	51.2

Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	62.5	62.5	< 0.005	< 0.005	—	62.7

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.7	21.7	< 0.005	< 0.005	—	21.7
General Heavy Industry	0.01	0.25	0.21	< 0.005	0.02	—	0.02	0.02	—	0.02	—	302	302	0.03	< 0.005	—	303
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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
Total	0.01	0.27	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	—	324	324	0.03	< 0.005	—	325
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.7	21.7	< 0.005	< 0.005	—	21.7

General Heavy Industry	0.01	0.25	0.21	< 0.005	0.02	—	0.02	0.02	—	0.02	—	302	302	0.03	< 0.005	—	303
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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
Total	0.01	0.27	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	—	324	324	0.03	< 0.005	—	325
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.59	3.59	< 0.005	< 0.005	—	3.60
General Heavy Industry	< 0.005	0.05	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	50.1	50.1	< 0.005	< 0.005	—	50.2
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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
Total	< 0.005	0.05	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	53.7	53.7	< 0.005	< 0.005	—	53.8

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.7	21.7	< 0.005	< 0.005	—	21.7

General Heavy Industry	0.01	0.25	0.21	< 0.005	0.02	—	0.02	0.02	—	0.02	—	302	302	0.03	< 0.005	—	303
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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
Total	0.01	0.27	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	—	324	324	0.03	< 0.005	—	325
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.7	21.7	< 0.005	< 0.005	—	21.7
General Heavy Industry	0.01	0.25	0.21	< 0.005	0.02	—	0.02	0.02	—	0.02	—	302	302	0.03	< 0.005	—	303
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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
Total	0.01	0.27	0.23	< 0.005	0.02	—	0.02	0.02	—	0.02	—	324	324	0.03	< 0.005	—	325
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.59	3.59	< 0.005	< 0.005	—	3.60
General Heavy Industry	< 0.005	0.05	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	50.1	50.1	< 0.005	< 0.005	—	50.2
Other Asphalt Surfaces	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

Other Non-Asphalt Surfaces	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
Total	< 0.005	0.05	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	53.7	53.7	< 0.005	< 0.005	—	53.8

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.18	0.01	1.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.42	4.42	< 0.005	< 0.005	—	4.44
Total	0.79	0.01	1.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.42	4.42	< 0.005	< 0.005	—	4.44
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Consum Products	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.50	0.50	< 0.005	< 0.005	—	0.50
Total	0.13	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.50	0.50	< 0.005	< 0.005	—	0.50

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.18	0.01	1.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.42	4.42	< 0.005	< 0.005	—	4.44
Total	0.72	0.01	1.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.42	4.42	< 0.005	< 0.005	—	4.44
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural Coatings	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.50	0.50	< 0.005	< 0.005	—	0.50
Total	0.12	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.50	0.50	< 0.005	< 0.005	—	0.50

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	0.91	4.71	5.62	0.09	< 0.005	—	8.63
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	9.77	50.6	60.3	1.00	0.02	—	92.7
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	10.7	55.3	66.0	1.10	0.03	—	101
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	0.91	4.71	5.62	0.09	< 0.005	—	8.63
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	9.77	50.6	60.3	1.00	0.02	—	92.7
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	10.7	55.3	66.0	1.10	0.03	—	101
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	0.15	0.78	0.93	0.02	< 0.005	—	1.43
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	1.62	8.37	9.99	0.17	< 0.005	—	15.3
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	1.77	9.15	10.9	0.18	< 0.005	—	16.8

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	0.91	4.71	5.62	0.09	< 0.005	—	8.63
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	9.77	50.6	60.3	1.00	0.02	—	92.7
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	10.7	55.3	66.0	1.10	0.03	—	101
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	0.91	4.71	5.62	0.09	< 0.005	—	8.63
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	9.77	50.6	60.3	1.00	0.02	—	92.7
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	10.7	55.3	66.0	1.10	0.03	—	101

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	0.15	0.78	0.93	0.02	< 0.005	—	1.43
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	1.62	8.37	9.99	0.17	< 0.005	—	15.3
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	1.77	9.15	10.9	0.18	< 0.005	—	16.8

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	1.34	0.00	1.34	0.13	0.00	—	4.68
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	14.7	0.00	14.7	1.47	0.00	—	51.5
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	16.1	0.00	16.1	1.61	0.00	—	56.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	1.34	0.00	1.34	0.13	0.00	—	4.68
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	14.7	0.00	14.7	1.47	0.00	—	51.5
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	16.1	0.00	16.1	1.61	0.00	—	56.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	0.22	0.00	0.22	0.02	0.00	—	0.78
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	2.44	0.00	2.44	0.24	0.00	—	8.53
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	2.66	0.00	2.66	0.27	0.00	—	9.31

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	1.34	0.00	1.34	0.13	0.00	—	4.68
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	14.7	0.00	14.7	1.47	0.00	—	51.5
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	16.1	0.00	16.1	1.61	0.00	—	56.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	1.34	0.00	1.34	0.13	0.00	—	4.68
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	14.7	0.00	14.7	1.47	0.00	—	51.5
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	16.1	0.00	16.1	1.61	0.00	—	56.2

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	0.22	0.00	0.22	0.02	0.00	—	0.78
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	2.44	0.00	2.44	0.24	0.00	—	8.53
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	2.66	0.00	2.66	0.27	0.00	—	9.31

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 0.005	< 0.005
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.95	0.95
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.95	0.95

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.74	5.74
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 0.005	< 0.005
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.95	0.95
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.95	0.95

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Thermal Oxidizer (TOU)	4.34	25.3	57.8	124	5.16	—	5.16	5.16	—	5.16	—	49,508	49,508	1.59	0.16	—	49,595

Off-Spec Flare Pilot	0.01	0.14	0.14	< 0.005	0.01	—	0.01	0.01	—	0.01	—	281	281	0.01	< 0.005	—	281
Genset with ICE	0.11	0.70	1.17	< 0.005	0.07	—	0.07	0.07	—	0.07	—	27.8	27.8	< 0.005	< 0.005	—	27.9
Total	4.46	26.1	59.1	124	5.24	—	5.24	5.24	—	5.24	—	49,816	49,816	1.60	0.16	—	49,904
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Thermal Oxidizer (TOU)	4.34	25.3	57.8	124	5.16	—	5.16	5.16	—	5.16	—	49,508	49,508	1.59	0.16	—	49,595
Off-Spec Flare Pilot	0.01	0.14	0.14	< 0.005	0.01	—	0.01	0.01	—	0.01	—	281	281	0.01	< 0.005	—	281
Genset with ICE	0.11	0.70	1.17	< 0.005	0.07	—	0.07	0.07	—	0.07	—	27.8	27.8	< 0.005	< 0.005	—	27.9
Total	4.46	26.1	59.1	124	5.24	—	5.24	5.24	—	5.24	—	49,816	49,816	1.60	0.16	—	49,904
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Thermal Oxidizer (TOU)	0.79	4.62	10.6	16.0	0.94	—	0.94	0.94	—	0.94	—	8,195	8,195	0.26	0.03	—	8,209
Off-Spec Flare Pilot	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	46.5	46.5	0.02	0.03	—	54.8
Genset with ICE	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.61	4.61	< 0.005	< 0.005	—	5.43
Total	0.79	4.65	10.6	16.0	0.94	—	0.94	0.94	—	0.94	—	8,246	8,246	0.28	0.05	—	8,270

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Thermal Oxidizer (TOU)	4.34	25.3	57.8	124	5.16	—	5.16	5.16	—	5.16	—	49,508	49,508	1.59	0.16	—	49,595
Off-Spec Flare Pilot	0.01	0.14	0.14	< 0.005	0.01	—	0.01	0.01	—	0.01	—	281	281	0.01	< 0.005	—	281
Genset with ICE	0.11	0.70	1.17	< 0.005	0.07	—	0.07	0.07	—	0.07	—	27.8	27.8	< 0.005	< 0.005	—	27.9
Total	4.46	26.1	59.1	124	5.24	—	5.24	5.24	—	5.24	—	49,816	49,816	1.60	0.16	—	49,904
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Thermal Oxidizer (TOU)	4.34	25.3	57.8	124	5.16	—	5.16	5.16	—	5.16	—	49,508	49,508	1.59	0.16	—	49,595
Off-Spec Flare Pilot	0.01	0.14	0.14	< 0.005	0.01	—	0.01	0.01	—	0.01	—	281	281	0.01	< 0.005	—	281
Genset with ICE	0.11	0.70	1.17	< 0.005	0.07	—	0.07	0.07	—	0.07	—	27.8	27.8	< 0.005	< 0.005	—	27.9
Total	4.46	26.1	59.1	124	5.24	—	5.24	5.24	—	5.24	—	49,816	49,816	1.60	0.16	—	49,904
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Thermal Oxidizer (TOU)	0.79	4.62	10.6	16.0	0.94	—	0.94	0.94	—	0.94	—	8,195	8,195	0.26	0.03	—	8,209
Off-Spec Flare Pilot	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	46.5	46.5	0.02	0.03	—	54.8
Genset with ICE	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.61	4.61	< 0.005	< 0.005	—	5.43
Total	0.79	4.65	10.6	16.0	0.94	—	0.94	0.94	—	0.94	—	8,246	8,246	0.28	0.05	—	8,270

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Earthworks A	Site Preparation	2/12/2025	2/26/2025	5.00	11.0	—
Earthworks B	Grading	2/27/2025	5/6/2025	5.00	49.0	—
Building Construction A	Building Construction	5/7/2025	12/19/2025	5.00	163	—
Building Construction B	Building Construction	12/23/2025	1/6/2026	5.00	11.0	—
Building Construction C	Building Construction	1/7/2026	3/4/2026	5.00	41.0	—
Paving	Paving	3/5/2026	3/19/2026	5.00	11.0	—
Architectural Coating	Architectural Coating	3/20/2026	4/9/2026	5.00	15.0	—
SoCalGas Pipeline Construction	Linear, Drainage, Utilities, & Sub-Grade	4/1/2025	7/1/2026	5.00	327	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Earthworks A	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Earthworks A	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Earthworks B	Rubber Tired Dozers	Diesel	Average	2.00	6.00	148	0.41
Earthworks B	Tractors/Loaders/Backhoes	Diesel	Average	2.00	6.00	84.0	0.37
Earthworks B	Cement and Mortar Mixers	Diesel	Average	1.00	6.00	367	0.40
Earthworks B	Sweepers/Scrubbers	Diesel	Average	1.00	6.00	36.0	0.46
Earthworks B	Dumpers/Tenders	Diesel	Average	10.0	6.00	16.0	0.38
Earthworks B	Off-Highway Trucks	Diesel	Average	1.00	6.00	376	0.38
Earthworks B	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Building Construction A	Cranes	Diesel	Average	2.00	6.00	367	0.29
Building Construction A	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction A	Tractors/Loaders/Backhoes	Diesel	Average	1.00	6.00	14.0	0.74
Building Construction A	Aerial Lifts	Diesel	Average	1.00	6.00	84.0	0.37
Building Construction A	Off-Highway Trucks	Diesel	Average	1.00	6.00	46.0	0.45
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	6.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	6.00	36.0	0.38
Paving	Cement and Mortar Mixers	Diesel	Average	2.00	6.00	10.0	0.56

Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48
SoCalGas Pipeline Construction	Bore/Drill Rigs	Diesel	Average	1.00	6.00	83.0	0.50
SoCalGas Pipeline Construction	Excavators	Diesel	Average	1.00	6.00	36.0	0.38
SoCalGas Pipeline Construction	Rubber Tired Dozers	Diesel	Average	1.00	6.00	367	0.40
SoCalGas Pipeline Construction	Tractors/Loaders/Backhoes	Diesel	Average	1.00	6.00	84.0	0.37
SoCalGas Pipeline Construction	Cranes	Diesel	Average	1.00	6.00	367	0.29
SoCalGas Pipeline Construction	Graders	Diesel	Average	1.00	6.00	148	0.41
SoCalGas Pipeline Construction	Other General Industrial Equipment	Diesel	Average	1.00	6.00	35.0	0.34
SoCalGas Pipeline Construction	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48
SoCalGas Pipeline Construction	Other Construction Equipment	Diesel	Average	1.00	6.00	82.0	0.42

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Earthworks A	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Earthworks A	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Earthworks B	Rubber Tired Dozers	Diesel	Average	2.00	6.00	148	0.41
Earthworks B	Tractors/Loaders/Backhoes	Diesel	Average	2.00	6.00	84.0	0.37
Earthworks B	Cement and Mortar Mixers	Diesel	Average	1.00	6.00	367	0.40
Earthworks B	Sweepers/Scrubbers	Diesel	Average	1.00	6.00	36.0	0.46
Earthworks B	Dumpers/Tenders	Diesel	Average	10.0	6.00	16.0	0.38

Earthworks B	Off-Highway Trucks	Diesel	Average	1.00	6.00	376	0.38
Earthworks B	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Building Construction A	Cranes	Diesel	Average	2.00	6.00	367	0.29
Building Construction A	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction A	Tractors/Loaders/Backhoes	Diesel	Average	1.00	6.00	14.0	0.74
Building Construction A	Aerial Lifts	Diesel	Average	1.00	6.00	84.0	0.37
Building Construction A	Off-Highway Trucks	Diesel	Average	1.00	6.00	46.0	0.45
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	6.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	6.00	36.0	0.38
Paving	Cement and Mortar Mixers	Diesel	Average	2.00	6.00	10.0	0.56
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48
SoCalGas Pipeline Construction	Bore/Drill Rigs	Diesel	Average	1.00	6.00	83.0	0.50
SoCalGas Pipeline Construction	Excavators	Diesel	Average	1.00	6.00	36.0	0.38
SoCalGas Pipeline Construction	Rubber Tired Dozers	Diesel	Average	1.00	6.00	367	0.40
SoCalGas Pipeline Construction	Tractors/Loaders/Backhoes	Diesel	Average	1.00	6.00	84.0	0.37
SoCalGas Pipeline Construction	Cranes	Diesel	Average	1.00	6.00	367	0.29
SoCalGas Pipeline Construction	Graders	Diesel	Average	1.00	6.00	148	0.41
SoCalGas Pipeline Construction	Other General Industrial Equipment	Diesel	Average	1.00	6.00	35.0	0.34

SoCalGas Pipeline Construction	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48
SoCalGas Pipeline Construction	Other Construction Equipment	Diesel	Average	1.00	6.00	82.0	0.42

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Earthworks A	—	—	—	—
Earthworks A	Worker	17.5	18.5	LDA,LDT1,LDT2
Earthworks A	Vendor	—	10.2	HHDT,MHDT
Earthworks A	Hauling	0.00	20.0	HHDT
Earthworks A	Onsite truck	—	—	HHDT
Earthworks B	—	—	—	—
Earthworks B	Worker	45.0	18.5	LDA,LDT1,LDT2
Earthworks B	Vendor	—	10.2	HHDT,MHDT
Earthworks B	Hauling	179	20.0	HHDT
Earthworks B	Onsite truck	—	—	HHDT
Building Construction A	—	—	—	—
Building Construction A	Worker	10.1	18.5	LDA,LDT1,LDT2
Building Construction A	Vendor	4.05	10.2	HHDT,MHDT
Building Construction A	Hauling	0.00	20.0	HHDT
Building Construction A	Onsite truck	—	—	HHDT
Building Construction B	—	—	—	—
Building Construction B	Worker	10.1	18.5	LDA,LDT1,LDT2
Building Construction B	Vendor	4.05	10.2	HHDT,MHDT
Building Construction B	Hauling	0.00	20.0	HHDT
Building Construction B	Onsite truck	—	—	HHDT

Building Construction C	—	—	—	—
Building Construction C	Worker	10.1	18.5	LDA,LDT1,LDT2
Building Construction C	Vendor	4.05	10.2	HHDT,MHDT
Building Construction C	Hauling	0.00	20.0	HHDT
Building Construction C	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	20.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	6.07	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT
SoCalGas Pipeline Construction	—	—	—	—
SoCalGas Pipeline Construction	Worker	22.5	18.5	LDA,LDT1,LDT2
SoCalGas Pipeline Construction	Vendor	0.00	10.2	HHDT,MHDT
SoCalGas Pipeline Construction	Hauling	0.27	20.0	HHDT
SoCalGas Pipeline Construction	Onsite truck	2.00	20.0	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Earthworks A	—	—	—	—
Earthworks A	Worker	17.5	18.5	LDA,LDT1,LDT2
Earthworks A	Vendor	—	10.2	HHDT,MHDT
Earthworks A	Hauling	0.00	20.0	HHDT
Earthworks A	Onsite truck	—	—	HHDT

Earthworks B	—	—	—	—
Earthworks B	Worker	45.0	18.5	LDA,LDT1,LDT2
Earthworks B	Vendor	—	10.2	HHDT,MHDT
Earthworks B	Hauling	179	20.0	HHDT
Earthworks B	Onsite truck	—	—	HHDT
Building Construction A	—	—	—	—
Building Construction A	Worker	10.1	18.5	LDA,LDT1,LDT2
Building Construction A	Vendor	4.05	10.2	HHDT,MHDT
Building Construction A	Hauling	0.00	20.0	HHDT
Building Construction A	Onsite truck	—	—	HHDT
Building Construction B	—	—	—	—
Building Construction B	Worker	10.1	18.5	LDA,LDT1,LDT2
Building Construction B	Vendor	4.05	10.2	HHDT,MHDT
Building Construction B	Hauling	0.00	20.0	HHDT
Building Construction B	Onsite truck	—	—	HHDT
Building Construction C	—	—	—	—
Building Construction C	Worker	10.1	18.5	LDA,LDT1,LDT2
Building Construction C	Vendor	4.05	10.2	HHDT,MHDT
Building Construction C	Hauling	0.00	20.0	HHDT
Building Construction C	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	20.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	6.07	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT

Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT
SoCalGas Pipeline Construction	—	—	—	—
SoCalGas Pipeline Construction	Worker	22.5	18.5	LDA,LDT1,LDT2
SoCalGas Pipeline Construction	Vendor	0.00	10.2	HHDT,MHDT
SoCalGas Pipeline Construction	Hauling	0.27	20.0	HHDT
SoCalGas Pipeline Construction	Onsite truck	2.00	20.0	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	37,073	12,358	9,605

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Earthworks A	0.00	0.00	10.3	0.00	—
Earthworks B	70,000	0.00	36.8	0.00	—
Paving	0.00	0.00	0.00	0.00	3.68
SoCalGas Pipeline Construction	0.00	704	0.00	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
General Office Building	0.00	0%
General Heavy Industry	0.00	0%
Other Asphalt Surfaces	0.53	100%
User Defined Linear	0.00	100%
Other Non-Asphalt Surfaces	3.14	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	532	0.03	< 0.005
2026	0.00	532	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
General Office Building	8.00	8.00	8.00	2,920	108	108	108	39,373
General Heavy Industry	2.00	2.00	2.00	730	27.0	27.0	27.0	9,843
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
General Office Building	8.00	8.00	8.00	2,920	108	108	108	39,373
General Heavy Industry	2.00	2.00	2.00	730	27.0	27.0	27.0	9,843
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	37,073	12,358	9,605

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Office Building	47,580	532	0.0330	0.0040	67,675
General Heavy Industry	211,472	532	0.0330	0.0040	943,569
Other Asphalt Surfaces	0.00	532	0.0330	0.0040	0.00
Other Non-Asphalt Surfaces	0.00	532	0.0330	0.0040	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Office Building	47,580	532	0.0330	0.0040	67,675
General Heavy Industry	211,472	532	0.0330	0.0040	943,569
Other Asphalt Surfaces	0.00	532	0.0330	0.0040	0.00
Other Non-Asphalt Surfaces	0.00	532	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Office Building	474,549	0.00
General Heavy Industry	5,097,906	0.00

Other Asphalt Surfaces	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Office Building	474,549	0.00
General Heavy Industry	5,097,906	0.00
Other Asphalt Surfaces	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Office Building	2.48	—
General Heavy Industry	27.3	—
Other Asphalt Surfaces	0.00	—
Other Non-Asphalt Surfaces	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Office Building	2.48	—
General Heavy Industry	27.3	—
Other Asphalt Surfaces	0.00	—
Other Non-Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
General Heavy Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
General Heavy Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type
Thermal Oxidizer (TOU)	Natural Gas
Off-Spec Flare Pilot	LFG
Genset with ICE	Natural Gas

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	9.78	annual days of extreme heat
Extreme Precipitation	3.80	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	41.0	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	1	1	2
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	65.7
AQ-PM	55.2
AQ-DPM	65.8
Drinking Water	47.3
Lead Risk Housing	6.36
Pesticides	65.3
Toxic Releases	65.8
Traffic	55.3
Effect Indicators	—
CleanUp Sites	71.6
Groundwater	39.9
Haz Waste Facilities/Generators	68.4
Impaired Water Bodies	43.8
Solid Waste	83.8
Sensitive Population	—
Asthma	2.50

Cardio-vascular	5.61
Low Birth Weights	29.9
Socioeconomic Factor Indicators	—
Education	13.7
Housing	23.4
Linguistic	70.3
Poverty	18.2
Unemployment	48.3

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	77.62094187
Employed	84.28076479
Median HI	92.14679841
Education	—
Bachelor's or higher	94.35390735
High school enrollment	21.05735917
Preschool enrollment	62.04285898
Transportation	—
Auto Access	86.34672142
Active commuting	14.52585654
Social	—
2-parent households	84.25510073
Voting	66.95752598
Neighborhood	—
Alcohol availability	88.92595919

Park access	28.96188887
Retail density	5.607596561
Supermarket access	46.38778391
Tree canopy	34.62081355
Housing	—
Homeownership	50.58385731
Housing habitability	79.40459387
Low-inc homeowner severe housing cost burden	70.24252534
Low-inc renter severe housing cost burden	87.52726806
Uncrowded housing	65.16104196
Health Outcomes	—
Insured adults	93.45566534
Arthritis	99.0
Asthma ER Admissions	98.5
High Blood Pressure	98.7
Cancer (excluding skin)	94.8
Asthma	95.7
Coronary Heart Disease	99.2
Chronic Obstructive Pulmonary Disease	99.4
Diagnosed Diabetes	98.9
Life Expectancy at Birth	84.7
Cognitively Disabled	82.5
Physically Disabled	94.1
Heart Attack ER Admissions	95.5
Mental Health Not Good	92.6
Chronic Kidney Disease	99.0
Obesity	98.0
Pedestrian Injuries	45.9

Physical Health Not Good	99.4
Stroke	99.1
Health Risk Behaviors	—
Binge Drinking	5.2
Current Smoker	88.4
No Leisure Time for Physical Activity	94.4
Climate Change Exposures	—
Wildfire Risk	38.7
SLR Inundation Area	0.0
Children	17.1
Elderly	90.8
English Speaking	40.4
Foreign-born	65.9
Outdoor Workers	98.2
Climate Change Adaptive Capacity	—
Impervious Surface Cover	77.7
Traffic Density	31.4
Traffic Access	23.0
Other Indices	—
Hardship	10.7
Other Decision Support	—
2016 Voting	74.5

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	30.0
Healthy Places Index Score for Project Location (b)	88.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No

Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Project Specific
Construction: Off-Road Equipment	Project Specific
Operations: Vehicle Data	Anticipated trip rate based on 4 additional employees
Operations: Fleet Mix	Anticipated Fleet Mix
Construction: Dust From Material Movement	Project specific

APPENDIX B – OPERATIONAL EQUIPMENT SPECIFICATIONS

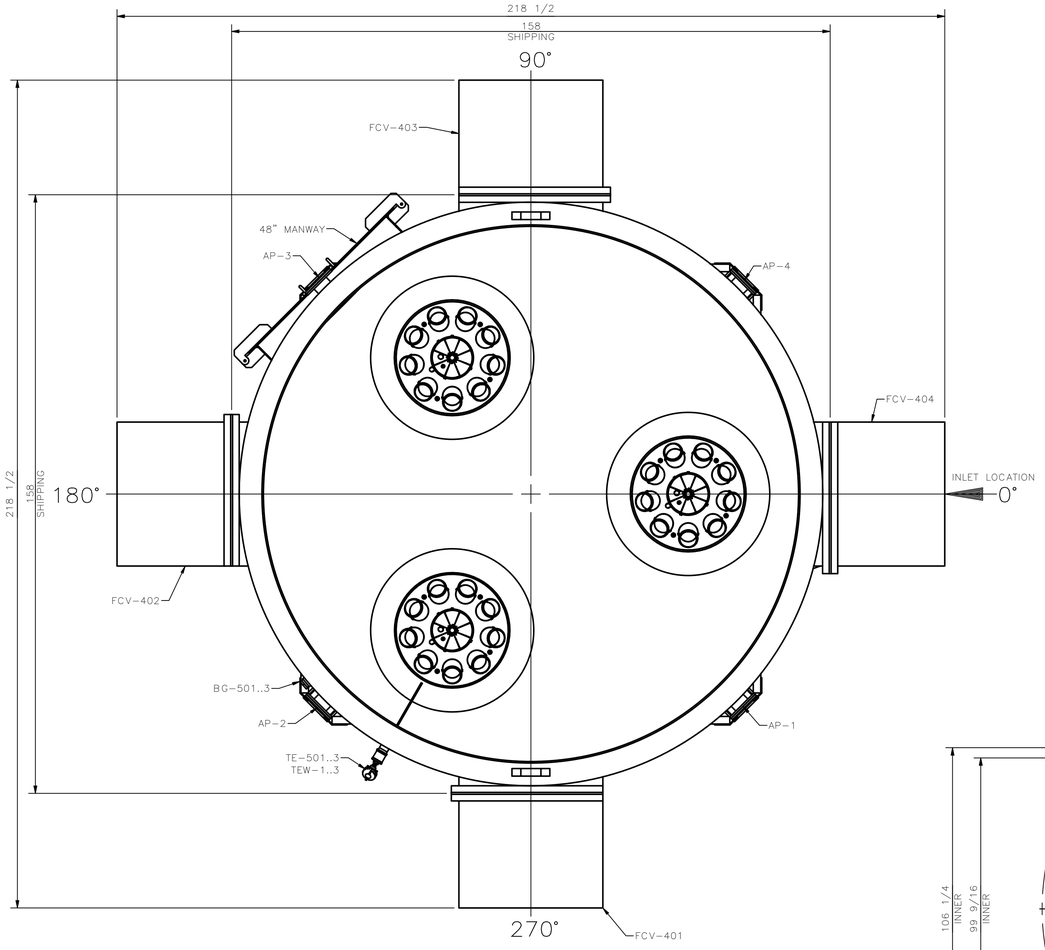
Equipment Data Sheet

120.0 MMBTU Flare

Spec. # 2125
Sheet # 1 Of 1
By: Kristi Wade
Date: 05 April 2024

Reference Designator or Item # **Off-Spec RNG Low NOx Enclosed Flare**

Quantity	1
Manufacturer or Approved Equal	PEI
Model #	FL-150-50-EN
RNG Max Capacity	120.0 MMBtu/h
RNG Min Capacity	24.0 MMBtu/h
Turn Down Ratio	5:1
Emissions Compliance Design Criteria	≤ 0.06 lb/MMBtu NOx
Temperature/Retention Time	Minimum 1400 Deg F for 0.6 Seconds
Maximum Skin Temperature	250 °F
Inlet Centerline Height	TBD
Flare Shell Height, O.D., Thickness	50', 150", 0.4375", ASTM A-36
Air Entrance Louvers	4 each – 91" w x 24" h, Automatic Controls
Flare floor, feet, manway, lift lug	ASTM-A-36
Top Ring & Shield	304L S.S.
Flare Insulation	4" Ceramic Fiber
Insulation Attachment	Inconel/SS 310 Studs & Retainers
Insulation Layers	3 ea. - Overlapping
Insulation Density	2" 4 lb/ft^3 and 2" 8 lb/ft^3
Inlet Nozzle Size	12" ANSI 150# Flange Pattern
Flare Burner Manifold & Associated Parts	304L S.S.
Combustion Air Blower Connected HP	< 200 HP
External Ladder	OSHA & ANSI A14.3 Standards
Manway Opening Size	24" x 24"
Flare Reference Drawing	PA-001-1363
Flare Reference Emissions Rule	SCAQMD Rule 1118.1 Other Flared Gas
COMMENTS or NOTES:	



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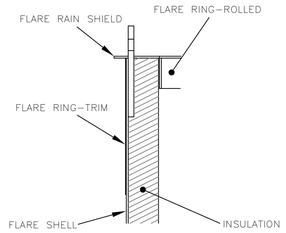

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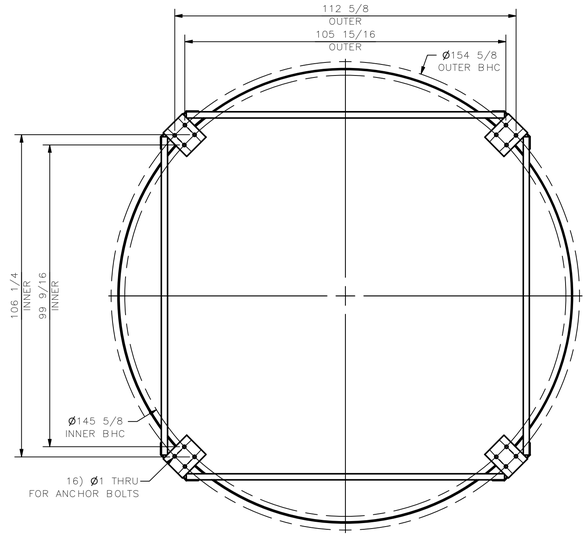

FOOT LAYOUT
SCALE 1:25

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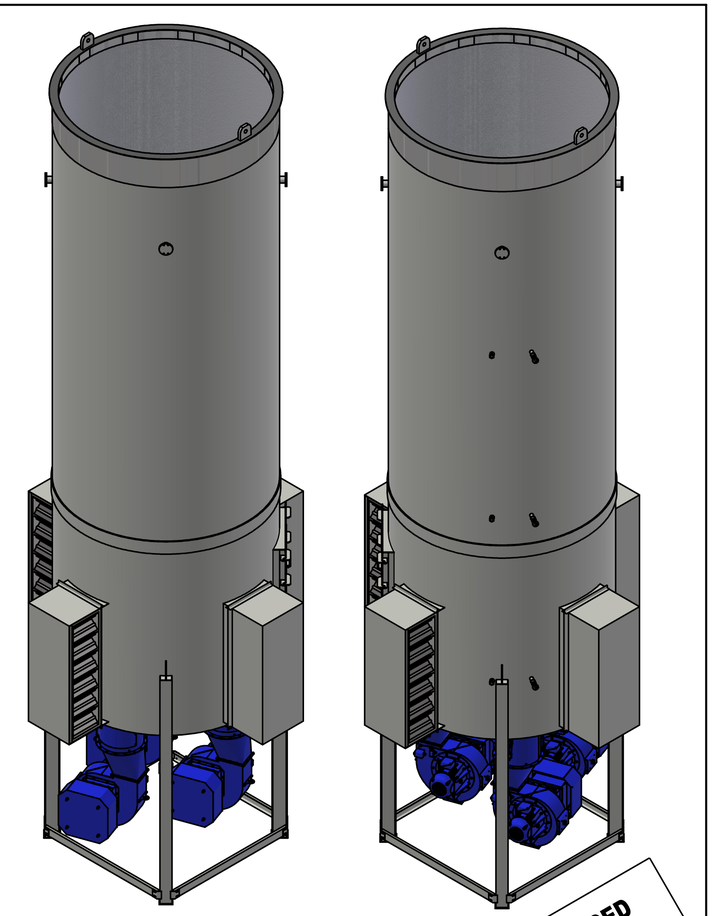


ISOMETRIC VIEWS
SCALE 1:50

REDUCED
FROM ORIGINAL
SIZE

NOTE:
1. CLASSIFIED AREAS ARE SPECIFICALLY NOTED. ALL OTHER AREAS ARE UNCLASSIFIED.
2. SKIDS MUST BE LEVEL 1/8" SIDE TO SIDE, 1/4" END TO END.
3. CONTACT PERENNIAL ENERGY FOR INTERIM MAINTENANCE PROCEDURES IF EQUIPMENT IS NOT RUNNING WITHIN 21 DAYS OF ARRIVAL ON SITE.
4. INSTALLED HEIGHT OF TOUCHSCREEN (HMI) SHOULD BE 66" ABOVE FINISHED GRADE AT OPERATOR LOCATION. IF THE PANEL IS MOUNTED ON A PAD THAT IS ABOVE SURROUNDING GRADE, INFORM PEI TO ALLOW FOR ADJUSTMENT IN HMI ELEVATION.
5. REMOVE SHIPPING STANDS, BRACES, AND COVERS PRIOR TO INSTALLATION.
6. UNLESS OTHERWISE NOTED, USE ON GAS WITH MORE THAN 1500 PPM, H2S VOIDS WARRANTY.
7. BLOWERS 50HP AND ABOVE MUST HAVE SKID FRAME RAILS UNDER THE BLOWER SOLIDLY SHIMMED OR GROUTED TO A SUITABLE CONCRETE PAD.
8. TO ASSEMBLY DIMENSIONS SHOWN ARE NOT ACTUAL SHIPPING DIMENSIONS, CONFIRM FIELD DIMENSIONS PRIOR TO ORDERING THE PROPER SHIPPING PERMITS.
9. DO NOT USE THIS DRAWING FOR LOCATION OF CAST IN PLACE ANCHORS.

LTR	DESCRIPTION	DATE	APPROVED
0			

REVISIONS

APPLICABLE JOB NO(S). 2125
FRB LANDFILL RNG OFF-SPEC FLARE

PEI PERENNIAL ENERGY
1375 COUNTY ROAD 8690
WEST PLAINS, MO 65775
www.PerennialEnergy.com

ENGINEERING SIGNATURES

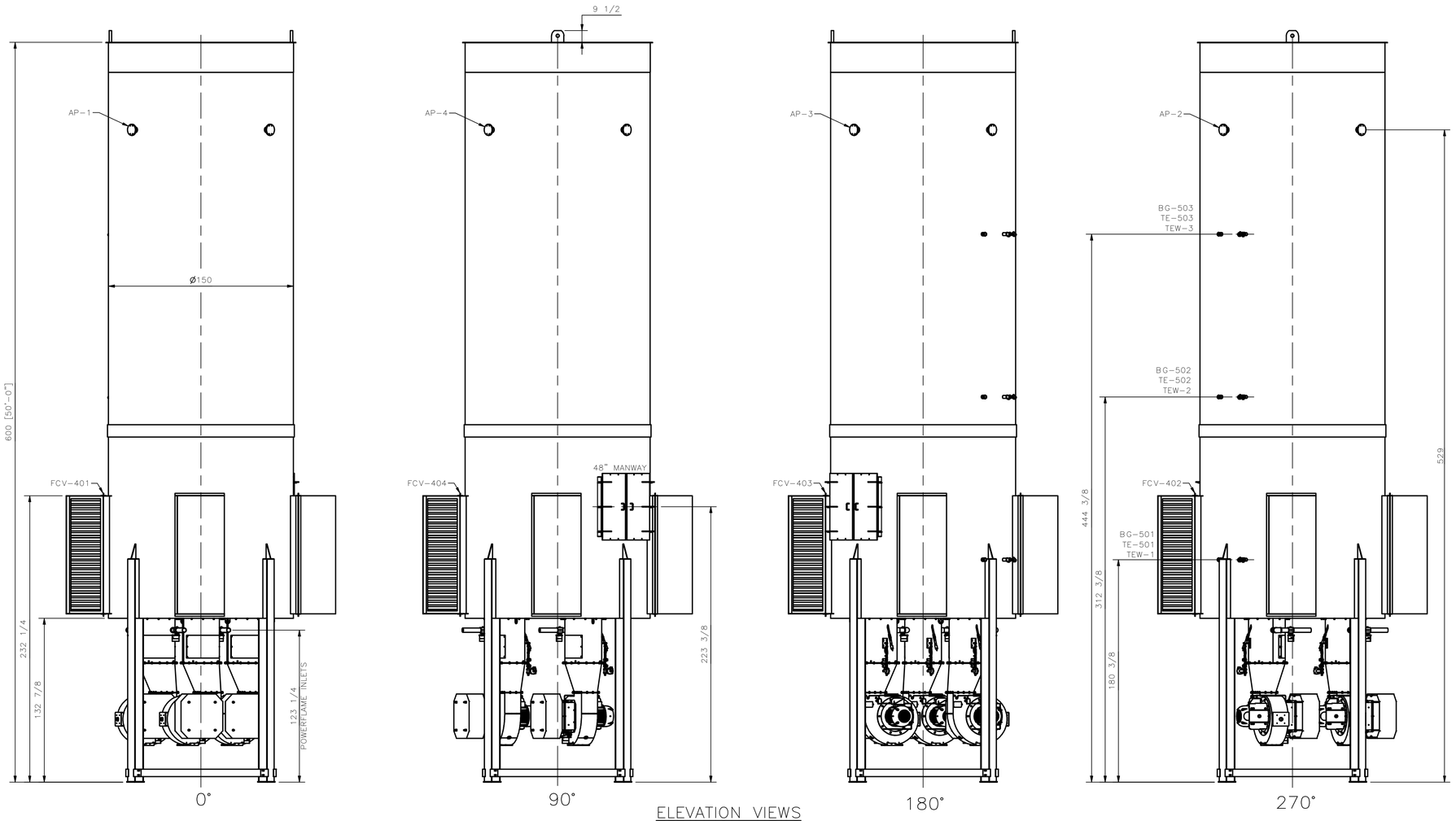
DESIGNED BY: K.WADE	DATE: 4/19/24
DRAWN BY: D.SMITH	DATE: 4/19/24

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
FRACT .XX ANGLES
±1/16 ±.03 ±0°30

TITLE:
FLARE TOP ASSEMBLY 150"OD x 600" TALL

SIZE: D
DWG. NO.: PA-001-1363

MATERIAL: AS NOTED
SCALE: AS NOTED
FILE NO. PA-001-1363.dwg
SHEET 1 OF 2



ELEVATION VIEWS
SCALE 1:50

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LTR	DESCRIPTION	DATE	APPROVED
0			

REVISIONS

APPLICABLE JOB NO(S): 2125
FRB LANDFILL RNG OFF-SPEC FLARE

PERENNIAL ENERGY
1375 COUNTY ROAD 8690
WEST PLAINS, MO 65775
www.PerennialEnergy.com

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MATERIAL: AS NOTED

TITLE:
FLARE TOP ASSEMBLY 150"OD x 600" TALL

SIZE: D
DWG. NO.: PA-001-1363

SCALE: AS NOTED | FILE NO. PA-001-1363.dwg | SHEET 2 OF 2

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Equipment Data Sheet

Job # **2126-TOU**
Sheet # **1** Of **1**

By: **Kristi Wade**

Date: **14 May 2024**

32.9 MMBTU/H Thermal Oxidizer

Reference Designator or Item # **TOU**

Quantity	1
Manufacturer or Approved Equal	PEI
Model #	FL-108X76-50-TP
Max Heat Rate	32.9 MMBtu/h @ 1,050 Btu/scf HHV
Min Heat Rate	6.58 MMBtu/h @ 1,050 Btu/scf HHV
Turn Down Ratio	5:1
Emissions Compliance Design Criteria NG Supplemental Fuel Burner only	0.024 lb/MMBtu NOx, 1000 PPM CO
Emissions Compliance Design Criteria NG Supplemental Fuel Burner with Process Gas	0.035lb/MMBtu NOx, 0.08 lb/MMBtu CO 0.006 lb/MMBtu VOC
Temperature/Retention Time	1400 Deg F for 0.6 Seconds
Maximum Skin Temperature	250 °F
Inlet Centerline Height	TBD
TOU Shell Height, O.D., Thickness	50', 108" x 76", 3/8", ASTM A-36
Air Entrance Louvers	4 each, Automatic Controls
TOU floor, feet, manway, lift lug	ASTM-A-36
Top Ring & Shield	SS 304L
TOU Insulation	4" Ceramic Fiber
Insulation Attachment	Inconel Studs & Retainers
Insulation Layers	3 ea. - Overlapping
Insulation Density	2" 4 lb/ft^3 and 2" 8 lb/ft^3
Inlet Nozzle Size	10" (Waste Stream 1), 6" (Waste Stream 2), 3" (Natural Gas Stream) ANSI 150# Flange Pattern
TOU Burner Manifold & Associated Parts	304L SS
External Ladder & Fall Arrest Assembly	OSHA §1910.29 (D) (i) & ANSI A14.3 Standards
Manway Opening Size	36" x 36"
TOU Reference Drawings	PA-001-1380, ME-009-0667
TOU Reference Emissions Rule	SCAQMD Rule 1147

COMMENTS or NOTES:

NOX emission rates are exclusive of fixed nitrogen in the fuel or injected in condensate, leachate, or other sources. Design assumes, the gas quality will have less than 2% O2, less than 1500 ppmv of H2S, 0 ppmv NH3, and 0% H. If gas constituents are more than the above, please contact Perennial Energy to discuss options and/or changes to the quoted equipment.

Please note: Mineral based particulates, such as wind-blown dust or silica, can be entrained into the ambient cooling and quenching air or purge air streams and passed into the combustor. As non-combustible matter, they will be passed into the exhaust stream and will be measured as particulate emissions, but are not generated by the combustion process. Additionally, Siloxanes will burn to SiO2. PEI makes no guarantees regarding these particulates, or particulates formed from the combustion of other non-methane constituents in the gas stream.

COMMENTS or NOTES:

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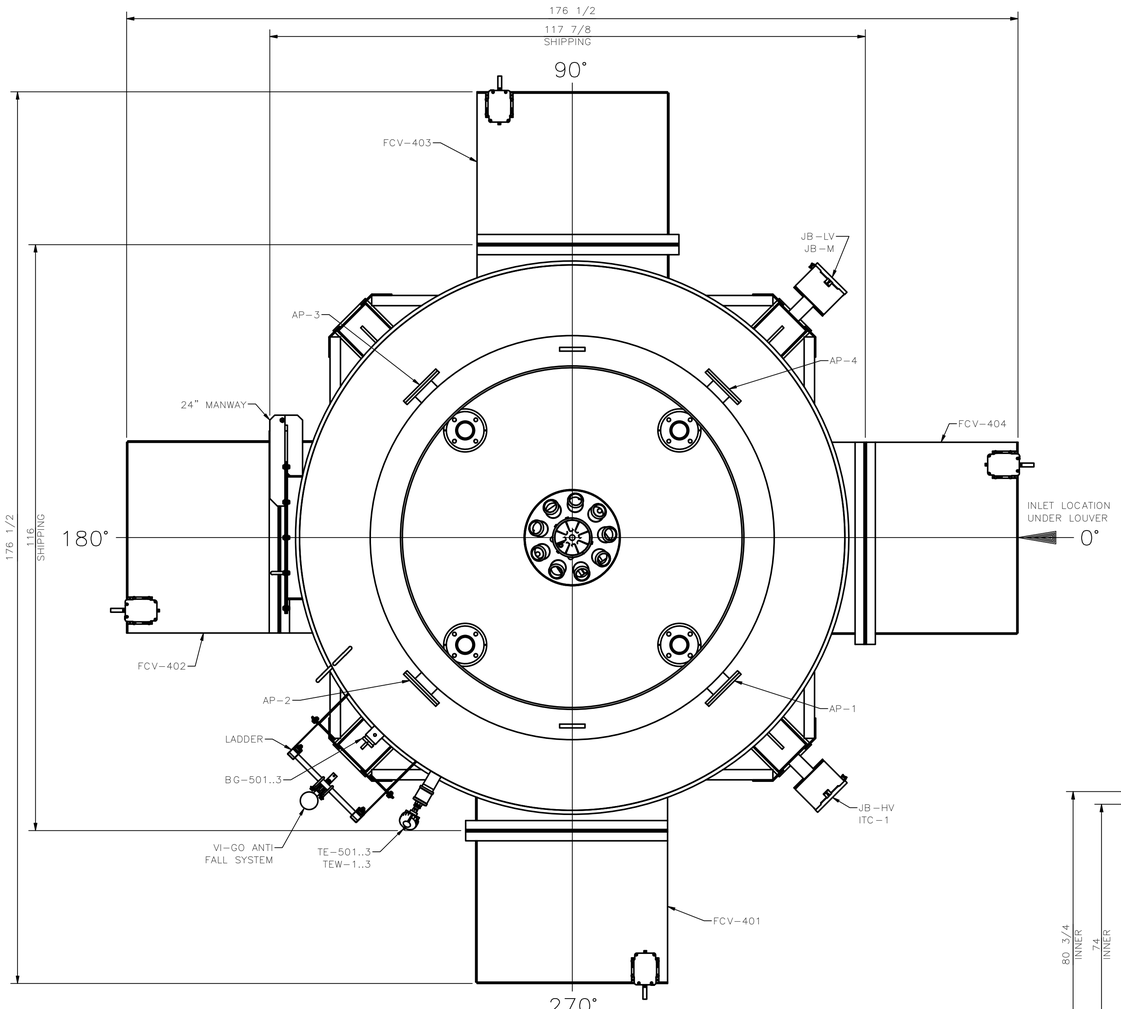
Design assumes, the gas quality will have less than 2% O_2, less than 1500 ppmv of H_2S, 0 ppmv NH_3, and 0% H. If gas constituents are more than the above, please contact Perennial Energy to discuss options and/or changes to the quoted equipment.



PLAN VIEW
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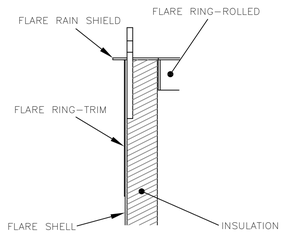

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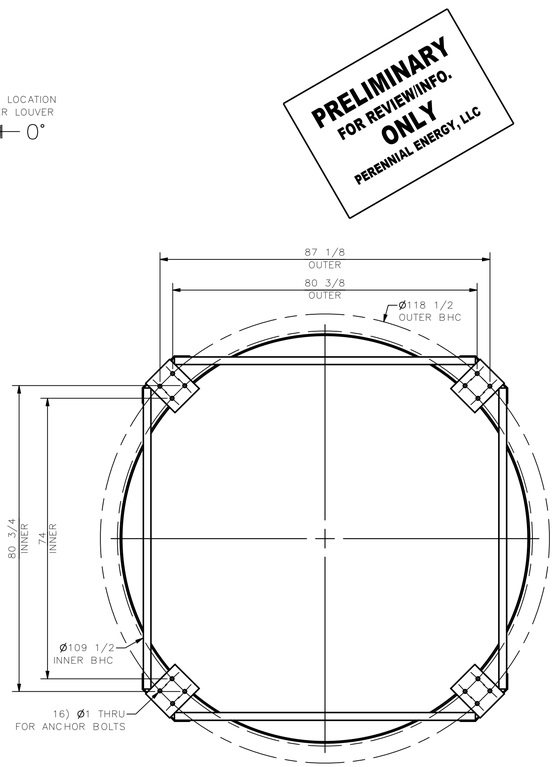
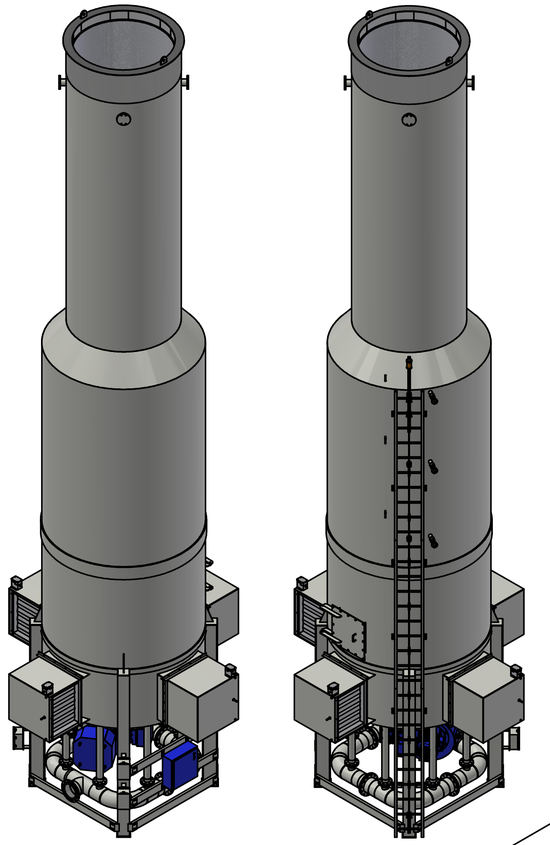


FOOT LAYOUT
SCALE 1:20



ISOMETRIC VIEWS
SCALE 1:50

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9. DO NOT USE THIS DRAWING FOR LOCATION OF CAST IN PLACE ANCHORS.

LTR	DESCRIPTION	DATE	APPROVED
0			

REVISIONS

APPLICABLE JOB NO(S). 2126
FRB LANDFILL RNG TOU

PERENNIAL ENERGY
1375 COUNTY ROAD 8690
WEST PLAINS, MO 65775
www.PerennialEnergy.com

ENGINEERING SIGNATURES

DESIGNED BY: K.WADE DATE: 4/18/24
DRAWN BY: D.SMITH DATE: 4/18/24

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
FRACT .XX ANGLES
±1/16 ±.03 ±0°30

TITLE:
TOU TOP ASSEMBLY
108"OD x 600" TALL

SIZE D | DWG. NO. PA-001-1380

MATERIAL: AS NOTED | SCALE: AS NOTED | FILE NO. PA-001-1380.dwg | SHEET 1 OF 2

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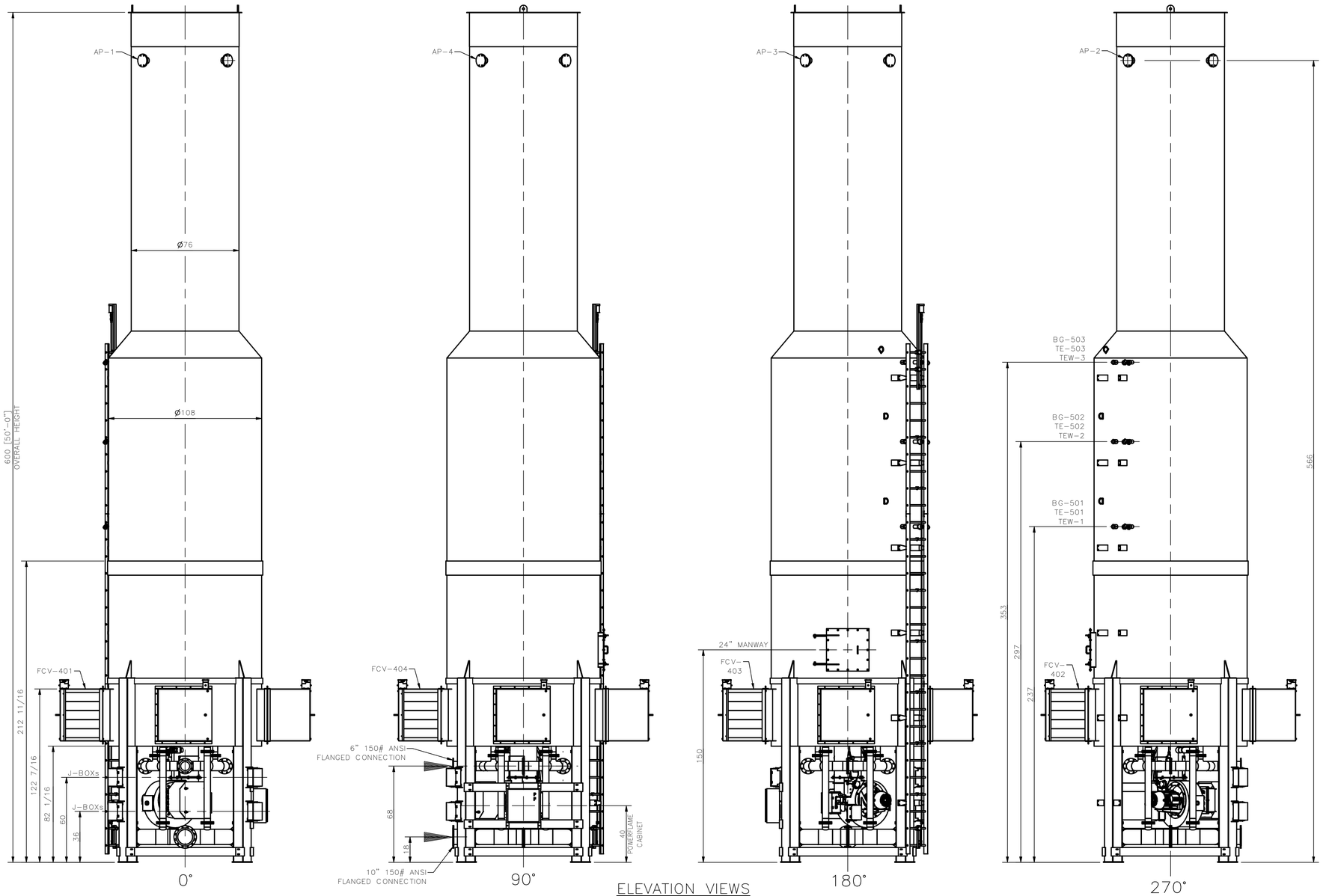

ELEVATION VIEWS
SCALE 1:40

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LTR	DESCRIPTION	DATE	APPROVED
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REVISIONS

APPLICABLE JOB NO(S). 2126
FRB LANDFILL RNG TOU

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1375 COUNTY ROAD 8690
WEST PLAINS, MO 65775
www.PerennialEnergy.com

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DESIGNED BY: K.WADE	DATE: 4/18/24
DRAWN BY: D.SMITH	DATE: 4/18/24

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
FRACT ±1/16 .XX ±.03 ANGLES ±0°30

MATERIAL: AS NOTED

TITLE:
TOU TOP ASSEMBLY
108"OD x 600" TALL

SIZE: D
DWG. NO. PA-001-1380

SCALE: AS NOTED
FILE NO. PA-001-1380.dwg
SHEET 2 OF 2

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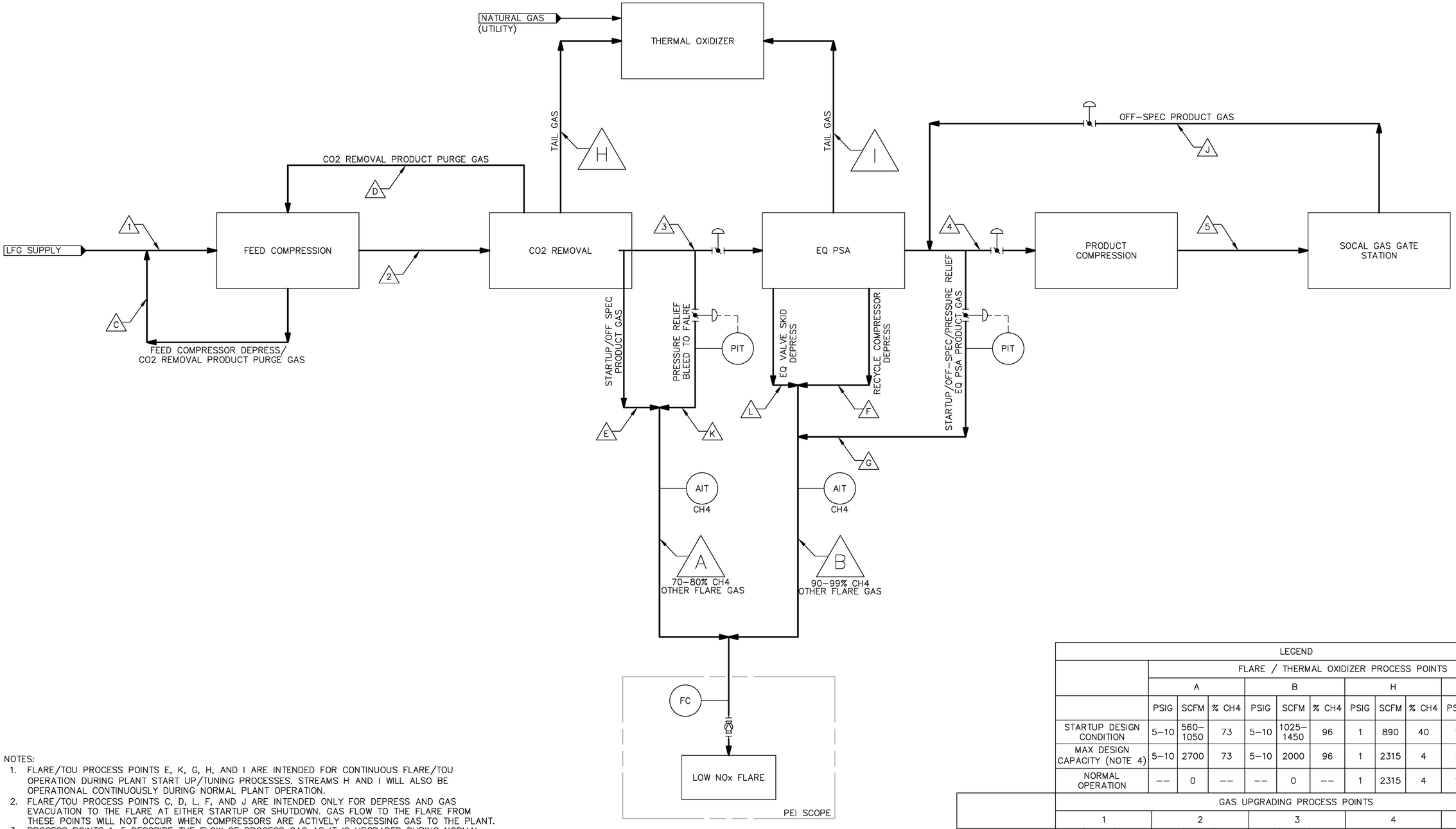


NOTES:

1. FLARE/TOU PROCESS POINTS E, K, G, H, AND I ARE INTENDED FOR CONTINUOUS FLARE/TOU OPERATION DURING PLANT START UP/TUNING PROCESSES. STREAMS H AND I WILL ALSO BE OPERATIONAL CONTINUOUSLY DURING NORMAL PLANT OPERATION.
2. FLARE/TOU PROCESS POINTS C, D, L, F, AND J ARE INTENDED ONLY FOR DEPRESS AND GAS EVACUATION TO THE FLARE AT EITHER STARTUP OR SHUTDOWN. GAS FLOW TO THE FLARE FROM THESE POINTS WILL NOT OCCUR WHEN COMPRESSORS ARE ACTIVELY PROCESSING GAS TO THE PLANT.
3. PROCESS POINTS 1-5 DESCRIBE THE FLOW OF PROCESS GAS AS IT IS UPGRADED DURING NORMAL OPERATIONS.
4. MAX DESIGN CPACITY FOR FLARE STREAMS A AND B ASSUME THAT THE FLARE IS BURNING GAS THROUGH EITHER STREAM A OR STREAM B, NOT BOTH SIMULTANEOUSLY. MAX DESIGN CAPACITY FOR TOU ASSUMES BOTH STREAM H AND STREAM I ARE RUNNING CONTINUOUSLY AS A PART OF THE NORMAL OPERATION OF THE PLANT.

LEGEND												
	FLARE / THERMAL OXIDIZER PROCESS POINTS											
	A			B			H			I		
	PSIG	SCFM	% CH4	PSIG	SCFM	% CH4	PSIG	SCFM	% CH4	PSIG	SCFM	% CH4
STARTUP DESIGN CONDITION	5-10	560-1050	73	5-10	1025-1450	96	1	890	40	1	375	11
MAX DESIGN CAPACITY (NOTE 4)	5-10	2700	73	5-10	2000	96	1	2315	4	1	885	11
NORMAL OPERATION	--	0	--	--	0	--	1	2315	4	1	885	11

	GAS UPGRADING PROCESS POINTS														
	1			2			3			4			5		
TIME	PSIG	SCFM	% CH4	PSIG	SCFM	% CH4	PSIG	SCFM	% CH4	PSIG	SCFM	% CH4	PSIG	SCFM	% CH4
STARTUP	0	1560	45-53	110	1450	45-53	100	375-525	73	20	1444	>96	20	1444	>96
NORMAL OPERATION	0	6000	45-53	110	5618	45-53	100	3303	73	20	2418	>96	20	2418	>96

REV	DATE	DESCRIPTION	DRN BY	DSN BY	CHK BY
0	04/24/24	ISSUED FOR SCAQMD PERMIT APPLICATION	MV	-	JF

MONTAUK RENEWABLES
5313 Campbells Run Road,
Pittsburgh, PA 15205

TENT ENGINEERING
452 NE Greenwood Ave.
Bend, OR 97701
www.tentengr.com

FLARE GASES PROCESS FLOW DIAGRAM

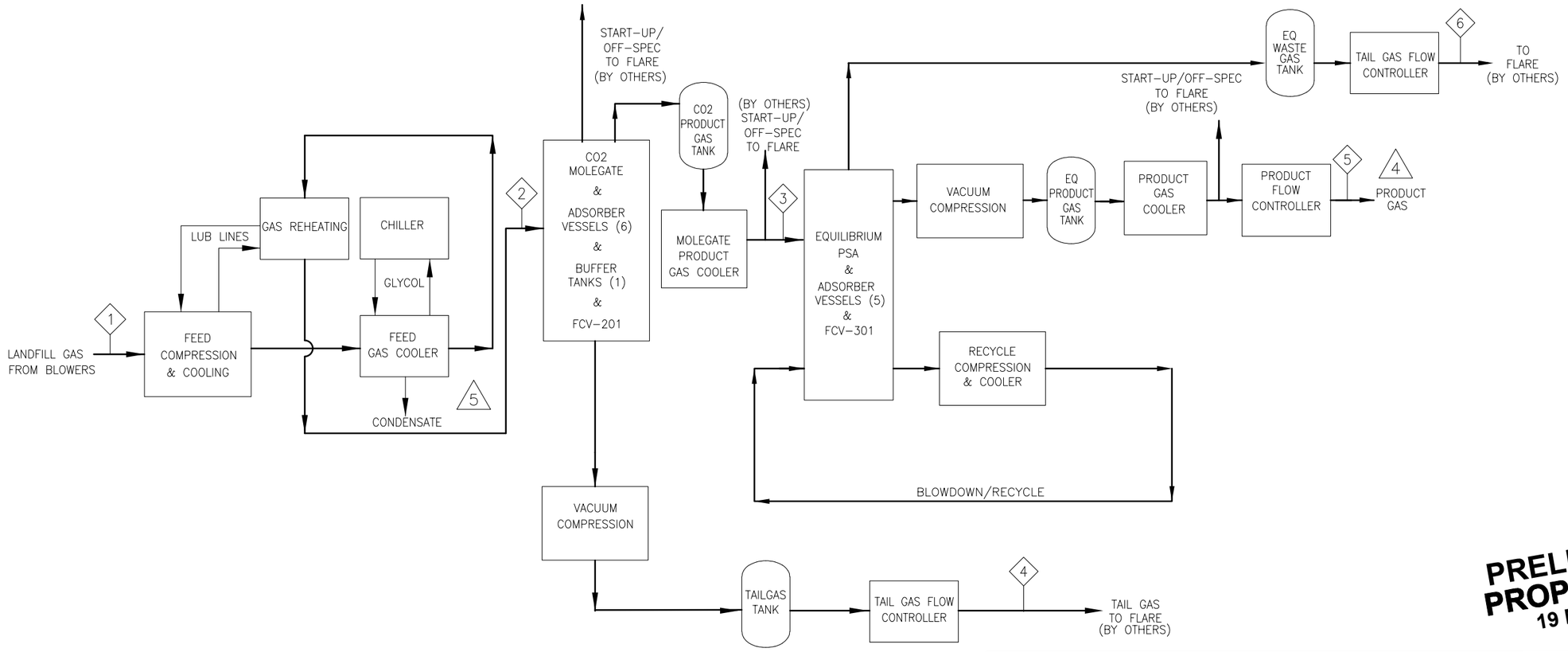
Bowerman RNG Facility
Bowerman Power LFG, LLC
11006 Bee Canyon Access Road,
Irvine, CA 92602

DRAWING NO.
P120
PROJECT NO.
164.02

NOTES: UNLESS OTHERWISE SPECIFIED

1. MAXIMUM FLOWS ARE SHOWN.
   SIMILAR FLOW RATIOS ARE EXPECTED IN TURNDOWN.
2. AVERAGE PRODUCT FLOW FROM THE SYSTEM IS SHOWN.
   SOME FLOW VARIATION IS EXPECTED.
3. TAIL GAS COMPOSITION WILL VARY WITH INLET CONCENTRATIONS AND DURING PLANT STARTUIP WHEN TAIL GAS METHANE CONCENTRATION CAN EXCEED 50% FOR A SHORT PERIOD OF TIME.
4. PRODUCT GAS SPECIFICATION
   TEMPERATURE: 40–120°F
   (3) CONSECUTIVE GC READINGS BEFORE SHUT–IN
   HIGHER HEATING VALUE (HHV): > 970 BTU/SCF
   CARBON DIOXIDE (CO2) CONTENT: <3.0%
   HYDROGEN SULFIDE (H2S) CONTENT: <4 PPM (0.25 GR/100SCF)
   TOTAL INERTS (N2+O2+CO2) CONTENT: <4.0%
   OXYGEN (O2) CONTENT: <0.20%
   NITROGEN (N2) CONTENT: <3.0%
   WATER (H2O) CONTENT: <7 LBS/MMSCF (<147 PPM)
5. CONDENSATION CONTAINS TRACE CO2 AND OIL
   CONDENSATE FLOW RATE: ~3,248 GPD
6. FEED COMPRESSOR DISCHARGE DEW POINT: 170°F
7. BDL IN THE MASS BALANCE REPRESENTS BELOW DETECTABLE LIMITS

STREAM	1 FEED GAS (DRY BASIS)	1 FEED GAS (WET BASIS)	2 CO2 PSA FEED	3 CO2 PSA PRODUCT	4 CO2 PSA TAIL GAS	5 EQ PSA PRODUCT	6 EQ PSA TAIL GAS
FLOW (SCFM)		6,000	5,604	3,295	2,309	2,412	883
PRESSURE (PSIG)		0	110	100	2	20	3
PRESSURE (PSIA)		14.67	124.67	114.67	16.67	34.67	17.67
TEMPERATURE °F		100	150	114	180	114	120
C1 (VOL%)	45.00	41.98	44.94	73.38	4.36	96.21	10.96
N2 (VOL%)	13.64	12.72	13.62	23.17	0.00	1.90	81.30
CO2 (VOL%)	40.05	37.36	40.00	1.25	95.29	1.71	0.00
O2 (VOL%)	1.30	1.21	1.30	2.21	0.00	0.18	7.75
H2S (PPM)	85	79	85	<4	206	< 4	< 4
H2O (VOL%)	SATURATED	6.72	0.14	<147 PPM	0.33	<147 PPM	<147 PPM
HHV		424	454	741	44	972	111



GENERAL DATA	
LOCATION	IRVINE, CA
ELEVATION (FEET)	72
BARO PRESSURE (PSIA)	14.67
AMBIENT TEMP (°F)	20 TO 104 °F

REVISIONS				
REV	DESCRIPTION	DATE	DRAWN	APPROVED

PRELIMINARY
PROPRIETARY
19 MAY 2023

APPLICATION	
NEXT ASSY	USED ON

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES

TOLERANCES
DECIMALS: .X= ±.1, .XX= ±.02, .XXX= ±.010
ANGLES: ±0 30', FRACTIONS ±1/32

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN BAT	05/19/23
CHECKED	
ENGINEERED T.RUSSELL	05/19/23
DESIGN ACTIVITY	
APPROVED	

GUILD ASSOCIATES, INC.
DUBLIN, OHIO 43016

TITLE
PFD
LANDFILL GAS CLEANUP

SIZE	CODE IDENT. NO.	DWG. NO.	REV.
D	4X630	MGXXX–00009	3

SCALE N/A | WEIGHT | SHEET 1 OF 1

MGXXX–00009 SH 1 REV 3

Donald Barkley

From: Tina Darjazanie
Sent: Friday, February 2, 2024 3:14 PM
To: Vahe Baboomian
Cc: James Adams (JAdams@YorkeEngr.com); Donald Barkley
Subject: FW: FRB- Bowerman RNG TOU Spec Sheet

Vahe,
Please review and let me know if this is different than before and if we need to modify the model and our report.

Yorke Service Areas Include: Air Quality, Storm Water, Hazardous Waste, Industrial Hygiene-Safety, and CEQA Technical Reports.
For a more detailed list: www.YorkeEngr.com/Services.

Tina Darjazanie, MSEnvE | Long Beach Office
Senior Engineer
O: (949) 248-8490 | M: (949) 324-9041
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Phone: (949) 248-8490 | Fax: (949) 248-8499
www.YorkeEngr.com

Yorke
ENGINEERING, LLC

Specializing in Air Quality and EH&S Services

From: Matthew Unger <munger@montaukrenewables.com>
Sent: Friday, February 2, 2024 3:10 PM
To: Tina Darjazanie <tdarjazanie@yorkeengr.com>
Subject: Fwd: FRB- Bowerman RNG TOU Spec Sheet

See below from PEI.

Matt Unger
Senior Environmental Specialist

Phone: (412) 779-8548
Munger@montaukrenewables.com

5313 Campbells Run Road, Suite 200
Pittsburgh, PA 15205

From: Kristi Wade <kwade@perennialenergy.com>
Sent: Friday, February 2, 2024 5:41:49 PM
To: Matthew Unger <munger@montaukrenewables.com>
Cc: Colby Staggs <cstaggs@perennialenergy.com>
Subject: RE: FRB- Bowerman RNG TOU Spec Sheet

Matt,
If they are referring to the Auxiliary fuel, we have the revised flows below (highlighted). I wanted to send all of the following information in case they needed any clarification on our re-sizing.

	"Start-up Stream" CO2 PSA Tail Gas Stream	***"Steady-State" CO2 PSA Tail Gas Stream***	***"Steady-State" EQ PSA Tail Gas Stream***
Flow (SCFM)	1,100	2,315	885
Pressure (psig)	2.0 to 5.0 psig	2.0	3.0
Temperature (°F)	180	180	120
CH4 %	40 %	4.36 %	10.96 %
CO2 %	59.67 %	95.29 %	0.0 %
N2 %	0.0 %	0.0 %	81.30 %
O2%	0.0 %	0.0 %	7.75 %
H_2S (PPM)	206	206	< 4
H_2O Content	0.33 %	0.33 %	< 147 PPM
Heat Rate at 1,050 Btu/scf HHV	27.7 MMBtu/hr	6.4 MMBtu/hr	6.1 MMBtu/hr

The **Thermal Oxidizer (TOU)** is designed for a total capacity of **32.9 MMBtu/hr** at 1,050 Btu/scf HHV. The TOU is designed to handle the above Start-up Stream from the CO2 PSA System (27.7 MMBtu/hr) and the combined "Steady State" Tail Gas streams from the CO2 PSA and EQ PSA Systems (12.5 MMBtu/hr) as well as an additional ***natural gas*** supplemental fuel stream of up to about **260 scfm**.

Stream Condition Description	**Design TOU Heat Rate**	**Calculated Design Case Supplemental Fuel Usage (Considering Natural Gas at 5 psig)**

Start-up *(Start-up Stream only for ~30 to 45 minutes, 1 hour max)*	**32.9 MMBtu/hr** at 1,050 Btu/scf	- Assume approx. **83 scfm** of natural gas, or minimum turndown of process burner (Approx. **5.2 MMBtu/hr** at 1,050 Btu/scf)
Normal Operation *(Both Steady State streams from the CO2 PSA Tail and EQ PSA Systems)*	**28.9 MMBtu/hr** at 1,050 Btu/scf	- Approx. **130 to 260 scfm** of natural gas at 1600 to 1800 °F - Approx. **8.2 to 16.4 MMBtu/hr** at 1,050 Btu/scf

Calculated Heat Rate at Each Process Condition		
	Start-up	**Normal Operation** *(Steady State)*
Total Heat Rate	**32.9 MMBtu/hr** at 1,050 Btu/scf	**28.9 MMBtu/hr** at 1,050 Btu/scf
Supplemental Fuel Usage (Considering Natural Gas at 5 psig)	**5.2 MMBtu/hr** at 1,050 Btu/scf	**16.4 MMBtu/hr** at 1,050 Btu/scf
CO2 PSA Tail Gas Stream Heat Rate	**27.7 MMBtu/hr** at 1,050 Btu/scf	**6.4 MMBtu/hr** at 1,050 Btu/scf
EQ PSA Tail Gas Stream Heat Rate	N/A	**6.1 MMBtu/hr** at 1,050 Btu/scf

Please let us know if you have any more questions!

Kristi Wade
417-505-7181

From: Matthew Unger <munger@montaukrenewables.com>
Sent: Thursday, February 1, 2024 11:51 AM
To: Kristi Wade <kwade@perennialenergy.com>
Subject: FW: FRB- Bowerman RNG TOU Spec Sheet

Kristi,

Please see the email below from our permitting contractor. Do you have this information on the pilot gas?

Thank you,

Matt Unger
Senior Environmental Specialist

Phone: (412) 779-8548
munger@montaukrenewables.com

5313 Campbells Run Road, Suite 200
Pittsburgh, PA 15205

MONTAUK RENEWABLES

www.montaukrenewables.com

From: Tina Darjazanie <tdarjazanie@yorkeengr.com>
Sent: Thursday, February 1, 2024 12:41 PM
To: Matthew Unger <munger@montaukrenewables.com>
Cc: Vahe Baboomian <vbaboomian@yorkeengr.com>
Subject: RE: FRB- Bowerman RNG TOU Spec Sheet

Hi Matt,

The previous TOU rated at 24.1 MMBtu/hr had a pilot gas design fuel usage between 106 -199 scfm – where we used the 199 scfm fuel usage rate to calculate emissions. Please see below based on an email from 10/02/2023.

> The **Thermal Oxidizer (TOU)** is designed for a total capacity of **24.1 MMBtu/hr**. The TOU is designed to handle the provided tail gas conditions as well as an additional ***natural gas*** supplemental fuel stream of up to about **199 scfm**.

Stream Condition Description	Design TOU Heat Rate (Considering a HHV of 1,010 Btu/scf)	Tail Gas Heat Rate (Considering HHV of 1,010 Btu/scf)	Calculated Design Case Supplemental Fuel Usage (Considering Natural Gas at 5 psig)
Both Streams	24.1 MMBtu/hr	12.0 MMBtu/hr	- About **106 to 199 scfm** of natural gas at 1600 to 1800 °F (or about **6.4 to 12.1 MMBtu/hr** at 1,010 Btu/scf)

Does the revised TOU rated at 32.9 MMBtu/hr have the same pilot gas design fuel usage? If not, can you please provide the updated pilot gas fuel usage?

Thanks,

Yorke Service Areas Include: Air Quality, Storm Water, Hazardous Waste, Industrial Hygiene-Safety, and CEQA Technical Reports.
For a more detailed list: www.YorkeEngr.com/Services.

Tina Darjazanie, MSEnvE | Long Beach Office
Senior Engineer
O: (949) 248-8490 | M: (949) 324-9041
TDarjazanie@YorkeEngr.com | V-card Link

Donald Barkley

From: Kristi Wade <kwade@perennialenergy.com>
Sent: Wednesday, April 24, 2024 2:41 PM
To: Donald Barkley
Cc: Vahe Baboomian
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

Follow Up Flag: Flag for follow up
Flag Status: Flagged

Don,
Yes, I was accounting for the insulation which is 4" thick as well as a shell thickness of 3/8" on each unit. I see now that we had 7/16" thick on the off spec flare. This makes the ID of the flare 141 1/8". Please use this exhaust diameter for the off spec flare.

For the natural gas pilot, I am getting confirmation from the burner vendor for the Btu rating.

Kristi Wade
417-505-7181

From: Donald Barkley <dbarkley@yorkeengr.com>
Sent: Wednesday, April 24, 2024 12:22 PM
To: Kristi Wade <kwade@perennialenergy.com>
Cc: Vahe Baboomian <vbaboomian@yorkeengr.com>
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

HI Kristi,

Thanks for the information. Can you clarify how the inside diameters are derived for the 150" OD Flare, with 0.4375 shell thickness, and the 76" OD TOU, with 0.375 shell thickness. Are the inside diameters accounting for insulation? If so, can you please supply the insulation thickness for the TOU and the Flare.

Also, before we run the modeling again, we just wanted to confirm that the natural gas pilot on the Flare is still rated at 100,000 BTU/hr.

Thanks,
Don

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Senior Engineer
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DBarkley@YorkeEngr.com | V-card Link

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Phone: (949) 248-8490 | Fax: (949) 248-8499
www.YorkeEngr.com

Yorke ENGINEERING, LLC

Specializing in Air Quality and EH&S Services

From: Kristi Wade <kwade@perennialenergy.com>
Sent: Tuesday, April 23, 2024 2:22 PM
To: Vahe Baboomian <vbaboomian@yorkeengr.com>; Colby Staggs <cstaggs@perennialenergy.com>; Brad Alexander <balexander@perennialenergy.com>
Cc: Matthew Unger <Munger@montaukrenewables.com>; Donald Barkley <dbarkley@yorkeengr.com>; James Adams <jadams@yorkeengr.com>
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

Vahe,
One modification to my response below. Please change the natural gas consumption on the TOU to a **maximum of 280 SCFM.**

Thank you!

Kristi Wade
417-505-7181

From: Kristi Wade
Sent: Tuesday, April 23, 2024 3:52 PM
To: 'Vahe Baboomian' <vbaboomian@yorkeengr.com>; Colby Staggs <cstaggs@perennialenergy.com>; Brad Alexander <balexander@perennialenergy.com>
Cc: Matthew Unger <Munger@montaukrenewables.com>; Donald Barkley <dbarkley@yorkeengr.com>; James Adams <jadams@yorkeengr.com>
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

Vahe,
See answers below in red. Please let me know if you have any questions.

Kristi Wade
417-505-7181

From: Vahe Baboomian <vbaboomian@yorkeengr.com>
Sent: Monday, April 22, 2024 3:00 PM
To: Kristi Wade <kwade@perennialenergy.com>
Cc: Matthew Unger <Munger@montaukrenewables.com>; Donald Barkley <dbarkley@yorkeengr.com>; James Adams <jadams@yorkeengr.com>
Subject: Bowerman RNG - PEI Flare/TOU Specification Clarification

Hello Kristi,

Can you please provide us with the following information for the most recent Flare and TOU revision. Also, can you please confirm if the process flow diagram will be updated due to the Flare/TOU revisions – namely the flow rates through streams A and B?

Flare:

- Exhaust temperature and exhaust flow rate (in acfm) at the exhaust point; 150,000 acfm @ 1018 deg F
- Please confirm if the new Flare will have an exhaust height of 50 feet. Confirmed. The flare height is 50 ft overall.
  Please note the exhaust diameter (ID of flare) is 141 ¼" since the OD of the shell is 150".

TOU

- Exhaust temperature and exhaust flow rate (in acfm) at the exhaust point; 39,000 acfm @ 1000 deg F
- Please confirm if the new TOU will have an exhaust diameter of 76"; The OD of the TOU is 76", which makes the exhaust diameter (ID) 67 ¼".
- Supplemental fuel (natural gas) flow rate – we currently have 260 scfm on file. Has this changed with the newest revision? 260 SCFM of natural gas is correct for the TOU.

Thank you,
Vahe

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Vahe Baboomian, Ph.D. | San Juan Capistrano Office
Scientist
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VBaboomian@YorkeEngr.com | V-card Link

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Vahe Baboomian

From: Kristi Wade <kwade@perennialenergy.com>
Sent: Thursday, April 25, 2024 3:23 PM
To: Vahe Baboomian; Matthew Unger
Cc: Donald Barkley; Tina Darjazanie
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

Vahe,
Yes, you can use the conservative estimate with a continuous pilot at 100,000 Btu/hr.

Kristi Wade
417-505-7181

From: Vahe Baboomian <vbaboomian@yorkeengr.com>
Sent: Thursday, April 25, 2024 3:33 PM
To: Matthew Unger <Munger@montaukrenewables.com>; Kristi Wade <kwade@perennialenergy.com>
Cc: Donald Barkley <dbarkley@yorkeengr.com>; Tina Darjazanie <tdarjazanie@yorkeengr.com>
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

Hi Matt,

Yes, I was going to assume continuous operation as a conservative estimate. Just wanted to confirm the BTU/hr rating hasn't changed since there have been subtle differences in the latest flare and TOU design that need to be updated in the model.

Best,
Vahe

Vahe Baboomian, Ph.D. | San Juan Capistrano Office
Scientist
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VBaboomian@YorkeEngr.com | V-card Link

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Phone: (949) 248-8490 | Fax: (949) 248-8499
www.YorkeEngr.com

From: Matthew Unger <munger@montaukrenewables.com>
Sent: Thursday, April 25, 2024 1:27 PM

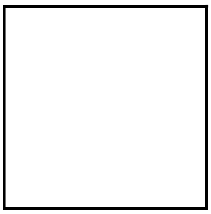
To: Vahe Baboomian <vbaboomian@yorkeengr.com>; Kristi Wade <kwade@perennialenergy.com>
Cc: Donald Barkley <dbarkley@yorkeengr.com>; Tina Darjazanie <tdarjazanie@yorkeengr.com>
Subject: Re: Bowerman RNG - PEI Flare/TOU Specification Clarification

To not delay the permit, could we assume continuous pilot as worst case scenario ?

Matt Unger
Southern Regional Environmental Manager

Phone: (412) 779-8548
Munger@montaukrenewables.com

5313 Campbells Run Road, Suite 200
Pittsburgh, PA 15205



www.montaukrenewables.com

From: Vahe Baboomian <vbaboomian@yorkeengr.com>
Sent: Thursday, April 25, 2024 4:25:47 PM
To: Kristi Wade <kwade@perennialenergy.com>
Cc: Donald Barkley <dbarkley@yorkeengr.com>; Tina Darjazanie <tdarjazanie@yorkeengr.com>; Matthew Unger <munger@montaukrenewables.com>
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

Hi Kristi,

Yes, we need confirmation on the pilot gas BTU/hr rating since we need to calculate the hourly and yearly emissions that come from the pilot gas.

Thanks,
Vahe

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Scientist
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From: Kristi Wade <kwade@perennialenergy.com>
Sent: Thursday, April 25, 2024 12:42 PM
To: Vahe Baboomian <vbaboomian@yorkeengr.com>
Cc: Donald Barkley <dbarkley@yorkeengr.com>; Tina Darjazanie <tdarjazanie@yorkeengr.com>; Matthew Unger <Munger@montaukrenewables.com>
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

Nothing back from them yet. I will let you know as soon as they respond.

Are you just needing the BTU/hr rating? There have been discussions whether we needed a continuous pilot or not. Will this make a difference in your modeling results?

Kristi Wade
417-505-7181

From: Vahe Baboomian <vbaboomian@yorkeengr.com>
Sent: Thursday, April 25, 2024 12:56 PM
To: Kristi Wade <kwade@perennialenergy.com>
Cc: Donald Barkley <dbarkley@yorkeengr.com>; Tina Darjazanie <tdarjazanie@yorkeengr.com>; Matthew Unger <Munger@montaukrenewables.com>
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

Hi Kristi,

Any updates on confirming if the natural gas pilot on the Flare is still rated at 100,000 BTU/hr? We need this confirmed to finalize our modeling results.

Vahe Baboomian

From: Kristi Wade <kwade@perennialenergy.com>
Sent: Wednesday, April 24, 2024 2:41 PM
To: Donald Barkley
Cc: Vahe Baboomian
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

Follow Up Flag: Flag for follow up
Flag Status: Flagged

Don,
Yes, I was accounting for the insulation which is 4" thick as well as a shell thickness of 3/8" on each unit. I see now that we had 7/16" thick on the off spec flare. This makes the ID of the flare 141 1/8". Please use this exhaust diameter for the off spec flare.

For the natural gas pilot, I am getting confirmation from the burner vendor for the Btu rating.

Kristi Wade
417-505-7181

From: Donald Barkley <dbarkley@yorkeengr.com>
Sent: Wednesday, April 24, 2024 12:22 PM
To: Kristi Wade <kwade@perennialenergy.com>
Cc: Vahe Baboomian <vbaboomian@yorkeengr.com>
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

HI Kristi,

Thanks for the information. Can you clarify how the inside diameters are derived for the 150" OD Flare, with 0.4375 shell thickness, and the 76" OD TOU, with 0.375 shell thickness. Are the inside diameters accounting for insulation? If so, can you please supply the insulation thickness for the TOU and the Flare.

Also, before we run the modeling again, we just wanted to confirm that the natural gas pilot on the Flare is still rated at 100,000 BTU/hr.

Thanks,
Don

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Don Barkley, BSMechE, PE | San Juan Capistrano Office
Senior Engineer
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DBarkley@YorkeEngr.com | V-card Link

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www.YorkeEngr.com

From: Kristi Wade <kwade@perennialenergy.com>
Sent: Tuesday, April 23, 2024 2:22 PM
To: Vahe Baboomian <vbaboomian@yorkeengr.com>; Colby Staggs <cstaggs@perennialenergy.com>; Brad Alexander <balexander@perennialenergy.com>
Cc: Matthew Unger <Munger@montaukrenewables.com>; Donald Barkley <dbarkley@yorkeengr.com>; James Adams <jadams@yorkeengr.com>
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

Vahe,
One modification to my response below. Please change the natural gas consumption on the TOU to a **maximum of 280 SCFM**.

Thank you!

Kristi Wade
417-505-7181

From: Kristi Wade
Sent: Tuesday, April 23, 2024 3:52 PM
To: 'Vahe Baboomian' <vbaboomian@yorkeengr.com>; Colby Staggs <cstaggs@perennialenergy.com>; Brad Alexander <balexander@perennialenergy.com>
Cc: Matthew Unger <Munger@montaukrenewables.com>; Donald Barkley <dbarkley@yorkeengr.com>; James Adams <jadams@yorkeengr.com>
Subject: RE: Bowerman RNG - PEI Flare/TOU Specification Clarification

Vahe,
See answers below in red. Please let me know if you have any questions.

Kristi Wade
417-505-7181

From: Vahe Baboomian <vbaboomian@yorkeengr.com>
Sent: Monday, April 22, 2024 3:00 PM
To: Kristi Wade <kwade@perennialenergy.com>
Cc: Matthew Unger <Munger@montaukrenewables.com>; Donald Barkley <dbarkley@yorkeengr.com>; James Adams <jadams@yorkeengr.com>
Subject: Bowerman RNG - PEI Flare/TOU Specification Clarification

Hello Kristi,

Can you please provide us with the following information for the most recent Flare and TOU revision. Also, can you please confirm if the process flow diagram will be updated due to the Flare/TOU revisions – namely the flow rates through streams A and B?

Flare:

- Exhaust temperature and exhaust flow rate (in acfm) at the exhaust point; 150,000 acfm @ 1018 deg F
- Please confirm if the new Flare will have an exhaust height of 50 feet. Confirmed. The flare height is 50 ft overall.
  Please note the exhaust diameter (ID of flare) is 141 ¼" since the OD of the shell is 150".

TOU

- Exhaust temperature and exhaust flow rate (in acfm) at the exhaust point; 39,000 acfm @ 1000 deg F
- Please confirm if the new TOU will have an exhaust diameter of 76"; The OD of the TOU is 76", which makes the exhaust diameter (ID) 67 ¼".
- Supplemental fuel (natural gas) flow rate – we currently have 260 scfm on file. Has this changed with the newest revision? ~~260 SCFM of natural gas is correct for the TOU.~~

Thank you,
Vahe

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DG150

GAS ENGINE TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED (rpm):	1800	RATING STRATEGY:	EMERGENCY
COMPRESSION RATIO:	10.5	PACKAGE TYPE:	WITH RADIATOR
AFTERCOOLER TYPE:	ATAAC	RATING LEVEL:	STANDBY
INLET MANIFOLD AIR TEMP (°F):	131	FUEL:	NAT GAS
JACKET WATER OUTLET (°F):	176	FUEL SYSTEM:	LPG IMPCO WITH AIR FUEL RATIO CONTROL
ASPIRATION:	TA		
COOLING SYSTEM:	JW, OC, AC	FUEL PRESSURE RANGE(psig):	0.3-0.4
CONTROL SYSTEM:	EIS	FUEL METHANE NUMBER:	85
EXHAUST MANIFOLD:	DRY	FUEL LHV (Btu/scf):	905
COMBUSTION:	INTEGRATED CATALYST	ALTITUDE CAPABILITY AT 79°F INLET AIR TEMP. (ft):	2152
FAN POWER (bhp):	13	POWER FACTOR:	0.8
		VOLTAGE(V):	208-600

RATING		NOTES	LOAD	100%	75%	50%
PACKAGE POWER	(WITH FAN)	(1)(2)	ekW	150	113	75
PACKAGE POWER	(WITH FAN)	(1)(2)	kVA	188	140	94
ENGINE POWER	(WITHOUT FAN)	(2)	bhp	253	190	127
GENERATOR EFFICIENCY		(1)	%	83.8	85.4	88.8
PACKAGE EFFICIENCY(@ 1.0 Power Factor)	(ISO 3046/1)	(3)	%	29.6	27.8	28.3
THERMAL EFFICIENCY		(4)	%	44.9	48.4	48.6
TOTAL EFFICIENCY (@ 1.0 Power Factor)		(5)	%	74.5	76.2	76.9

ENGINE DATA						
PACKAGE FUEL CONSUMPTION	(ISO 3046/1)	(6)	Btu/ekW-hr	11512	12253	12046
PACKAGE FUEL CONSUMPTION	(NOMINAL)	(6)	Btu/ekW-hr	11512	12253	12046
ENGINE FUEL CONSUMPTION	(NOMINAL)	(6)	Btu/bhp-hr	6813	7252	7132
AIR FLOW (77°F, 14.7 psia)	(WET)	(7)(8)	ft3/min	320	237	170
AIR FLOW	(WET)	(7)(8)	lb/hr	1417	1049	754
FUEL FLOW (60°F, 14.7 psia)			scfm	32	25	17
COMPRESSOR OUT PRESSURE			in Hg(abs)	88.2	73.6	62.5
COMPRESSOR OUT TEMPERATURE			°F	303	228	163
AFTERCOOLER AIR OUT TEMPERATURE			°F	130	86	82
INLET MAN. PRESSURE		(9)	in Hg(abs)	76.3	62.0	51.4
INLET MAN. TEMPERATURE	(MEASURED IN PLENUM)	(10)	°F	130	86	82
TIMING		(11)	°BTDC	16	20	26
EXHAUST TEMPERATURE - ENGINE OUTLET		(12)	°F	1304	1221	1110
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(8)(13)	ft3/min	1177	836	556
EXHAUST GAS MASS FLOW	(WET)	(8)(13)	lb/hr	1504	1119	799

REGULATORY INFORMATION

AGENCY	TIER/STAGE	REGULATION	LOCALITY		MAX LIMITS	YEAR IN	YEAR OUT
EPA		S.I. STATIONARY EMERGENCY - NATURAL GAS	U.S. (EXCL CALIF)	(14)	g/bhp-hr - NOx: 2.0 CO: 4.0 VOC: 1	2011	----

ENERGY BALANCE DATA						
LHV INPUT		(15)	Btu/min	28781	22974	15064
HEAT REJECTION TO JACKET WATER (JW)		(16)(22)	Btu/min	4896	3639	2427
HEAT REJECTION TO ATMOSPHERE	(INCLUDES GENERATOR)	(17)	Btu/min	4527	3391	2045
HEAT REJECTION TO LUBE OIL (OC)		(18)(23)	Btu/min	470	518	357
HEAT REJECTION TO EXHAUST (LHV TO 77°F)		(19)(20)	Btu/min	8661	7774	5123
HEAT REJECTION TO EXHAUST (LHV TO 248°F)		(19)	Btu/min	7528	6938	4525
HEAT REJECTION TO AFTERCOOLER (AC)		(21)(23)	Btu/min	1126	685	277

CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1. (Standard reference conditions of 77°F, 29.60 in Hg barometric pressure.) No overload permitted at rating shown. Consult the altitude deration factor chart for applications that exceed the rated altitude or temperature.

Emission levels are at the Caterpillar provided catalyst outlet. Values are based on engine operation at steady state conditions. Tolerances specified are dependent upon fuel quality. Fuel methane number cannot vary more than ± 3.

For notes information consult page three.

FUEL USAGE GUIDE

CAT METHANE NUMBER	84	100
SET POINT TIMING	16	16
DERATION FACTOR	1	1

ALTITUDE DERATION FACTORS AT RATED SPEED

INLET AIR TEMP °F	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1	1	0.99	0.97	0.95	0.93	0.90	0.88	0.86	0.83	0.81	0.79	0.77
120	1	1	1	0.98	0.96	0.93	0.91	0.89	0.87	0.84	0.82	0.80	0.77
110	1	1	1	0.98	0.96	0.93	0.91	0.89	0.87	0.84	0.82	0.80	0.77
100	1	1	1	0.98	0.96	0.93	0.91	0.89	0.87	0.84	0.82	0.80	0.77
90	1	1	1	0.98	0.96	0.93	0.91	0.89	0.87	0.84	0.82	0.80	0.77
80	1	1	1	0.98	0.96	0.93	0.91	0.89	0.87	0.84	0.82	0.80	0.77
70	1	1	1	0.98	0.96	0.93	0.91	0.89	0.87	0.84	0.82	0.80	0.77
60	1	1	1	0.98	0.96	0.93	0.91	0.89	0.87	0.84	0.82	0.80	0.77
50	1	1	1	0.98	0.96	0.93	0.91	0.89	0.87	0.84	0.82	0.80	0.77

ALTITUDE (FEET ABOVE SEA LEVEL)

AFTERCOOLER HEAT REJECTION FACTORS (ACHRF)

INLET AIR TEMP °F	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1.34	1.39	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
120	1.25	1.31	1.36	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37
110	1.17	1.22	1.27	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
100	1.09	1.14	1.19	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
90	1	1.05	1.10	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
80	1	1	1.02	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03
70	1	1	1	1	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1	1	1	1	1
50	1	1	1	1	1	1	1	1	1	1	1	1	1

ALTITUDE (FEET ABOVE SEA LEVEL)

FUEL USAGE GUIDE:
This table shows the derate factor and full load set point timing required for a given fuel. Note that deration and set point timing adjustment may be required as the methane number decreases. Methane number is a scale to measure detonation characteristics of various fuels. The methane number of a fuel is determined by using the Caterpillar methane number calculation.

ALTITUDE DERATION FACTORS:
This table shows the deration required for various air inlet temperatures and altitudes. Use this information along with the fuel usage guide chart to help determine actual engine power for your site. The derate factors shown assume a specific air-to-core temperature rise and zero additional air flow restriction on the standard packaged radiator. Refer to TMI Systems Data for fan air flow and air-to-core temperature rise values. Increased fan airflow restriction or a different air-to-core rise value requires a Special Rating Request to determine actual engine power at your site. Additional rating may be available with a larger, custom radiator.

ACTUAL ENGINE RATING:
To determine the actual rating of the engine at site conditions, one must consider separately, limitations due to fuel characteristics and air system limitations. The Fuel Usage Guide deration establishes fuel limitations. The Altitude/ Temperature deration factors and RPC(reference the Caterpillar Methane Program) establish air system limitations. RPC comes into play when the Altitude/Temperature deration is less than 1.0 (100%). Under this condition, add the two factors together. When the site conditions do not require an Altitude/Temperature derate (factor is 1.0), it is assumed the turbocharger has sufficient capability to overcome the low fuel relative power, and RPC is ignored. To determine the actual power available, take the lowest rating between 1) and 2).
1) Fuel Usage Guide Deration
2) 1 - ((1 - Altitude / Temperature Deration) +(1 - RPC))

AFTERCOOLER HEAT REJECTION FACTORS(ACHRF):
To maintain a constant air inlet manifold temperature, as the inlet air temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor (ACHRF) to adjust for inlet air temp and altitude conditions. See note (22) for application of this factor in calculating the heat exchanger sizing criteria. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail.

NOTES:
1. Generator efficiencies, power factor, and voltage are based on standard generator. [Package Power (ekW) is calculated as: (Engine Power (bkW) - Fan Power (bkW)) x Generator Efficiency], [Package Power (kVA) is calculated as: (Engine Power (bkW) - Fan Power (bkw)) x Generator Efficiency / Power Factor]
2. Rating is with one engine driven jacket water pump. Tolerance is (+)3, (-)0% of full load.
3. Package Efficiency published in accordance with ISO 3046/1, based on a 1.0 power factor.
4. Thermal Efficiency is calculated based on energy recovery from the jacket water, lube oil, and exhaust to 248°F with engine operation at ISO 3046/1 Package Efficiency, and assumes unburned fuel is converted in an oxidation catalyst.
5. Total efficiency is calculated as: Package Efficiency + Thermal Efficiency. Tolerance is ±10% of full load data.
6. ISO 3046/1 Package fuel consumption tolerance is (+)5, (-)0% at the specified power factor. Nominal package and engine fuel consumption tolerance is ± 5.0% of full load data at the specified power factor.
7. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.
8. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.
9. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.
10. Inlet manifold temperature is a set point value.
11. Timing indicated is for use with the minimum fuel methane number specified. Consult the appropriate fuel usage guide for timing at other methane numbers.
12. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.
13. Exhaust flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 6 %.
14. Gaseous emissions data measurements are consistent with those described in EPA 40 CFR PART 60 SUBPART JJJJ and ISO 8178 for measuring VOC, CO, and NOx. Gaseous emissions values are weighted cycle averages and are in compliance with the stationary regulations.
15. LHV rate tolerance is ± 5.0%.
16. Heat rejection to jacket water value displayed includes heat to jacket water alone. Value is based on treated water. Tolerance is ± 10% of full load data.
17. Heat rejection to atmosphere based on treated water. Tolerance is ± 50% of full load data.
18. Lube oil heat rate based on treated water. Tolerance is ± 20% of full load data.
19. Exhaust heat rate based on treated water. Tolerance is ± 10% of full load data.
20. Heat rejection to exhaust (LHV to 77°F) value shown includes unburned fuel and is not intended to be used for sizing or recovery calculations.
21. Heat rejection to aftercooler tolerance is ±5% of full load data.
22. Total Jacket Water Circuit heat rejection is calculated as: JW x 1.1. Heat exchanger sizing criterion is maximum circuit heat rejection at site conditions, with applied tolerances. A cooling system safety factor may be multiplied by the total circuit heat rejection to provide additional margin.
23. Total Lube Oil Cooler Circuit heat rejection is calculated as: OC x 1.2. Heat exchanger sizing criterion is maximum circuit heat rejection at site conditions, with applied tolerances. A cooling system safety factor may be multiplied by the total circuit heat rejection to provide additional margin.
24. Total Aftercooler Circuit heat rejection is calculated as: AC x ACHRF x 1.05. Heat exchanger sizing criterion is maximum circuit heat rejection at site conditions, with applied tolerances. A cooling system safety factor may be multiplied by the total circuit heat rejection to provide additional margin.

Image shown may not reflect actual configuration.

Sound Attenuated and Weather Protective Enclosures

DG100 – DG200 (100 – 200 ekW Gas)

FEATURES

Robust/Highly Corrosion Resistant Construction

- Factory installed on skid base
- Caterpillar white/yellow paint
- Environmentally friendly, polyester powder baked paint
- 18 gauge Steel, 12 gauge 5052 grade Aluminum
- Zinc plated fasteners
- Stainless steel hinges
- Internally mounted exhaust silencing system
- Designed and tested to comply with UL 2200 Listed generator set package
- Comply with ASCE /SEI 7 for Wind Loads up to 100 (Steel) and 150 mph (Aluminum)
- Optional seismic certification offered
- Compression door latches providing solid door seal with door stopper

Excellent Access

- Large cable entry area for installation ease
- Accommodates side mounted single or multiple breakers
- Single door on left & rear side of the package
- Dual doors on right hand side
- Doors vertically hinged allow 180° opening rotation
- Doors capable of lift off at 90° opening rotation
- For non-routine service access are removable panels
- Standard Lube oil drain valve, coolant drain/valve piped to the exterior of the skid base
- Radiator fill cover

Security and Safety

- Lockable (keyed or padlock) doors which give full access to control panel and breaker
- Cooling fan and battery charging alternator fully guarded
- Oil fill and battery can only be reached via lockable access
- Optional externally mounted emergency stop button
- Designed for spreader bar lifting to ensure safety
- Stub-up area is rodent proof

Options

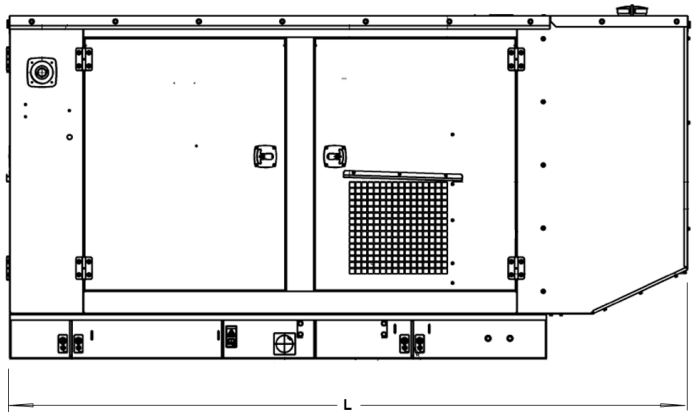
- Skid base compatible
- DC lighting package (Optional)

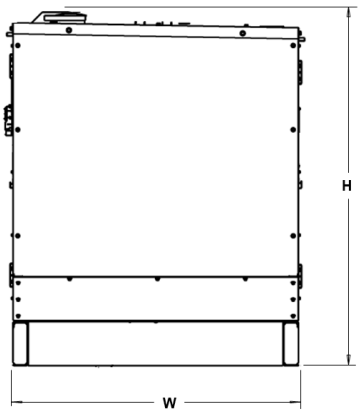
Weights & Dimensions

A. Package Weights and Dimensions

Enclosure Type	Genset Model	Length "L"		Width "W"		Height "H"		Package Weight	
		mm	in	mm	in	mm	in	kg	lb
Open Set on Skid Base (Wide)	DG100	2442	96	1297	51	1449	57	1364	3007
	DG125	2442	96	1297	51	1449	57	1464	3226
	DG150	2892	114	1396	55	1734	68	1657	3653
	DG175	2985	117.5	1600	63	1789	71	1780	3924
	DG200	2985	117.5	1600	63	1789	71	1780	3924
Sound Attenuated Level-2 Enclosure on Skid Base (Steel)	DG100	3100	122	1230	48	1606	63	1700	3748
	DG125	3100	122	1230	48	1606	63	1800	3968
	DG150	3348	132	1445	57	1875	74	2051	4522
	DG175	3624	143	1626	64	1987	78	2302	5075
	DG200	3624	143	1626	64	1987	78	2302	5075
Sound Attenuated Level-3 Enclosure on Skid Base (Steel)*	DG100	3100	122	1230	48	1606	63	1764	3889
	DG125	3100	122	1230	48	1606	63	1864	4109
	DG150	3348	132	1445	57	1875	74	2085	4597
	DG175*	3624	143	1626	64	1987	78	–	–
	DG200*	3624	143	1626	64	1987	78	–	–
Sound Attenuated Level-2 Enclosure on Skid Base (Aluminum)	DG100	3100	122	1230	48	1606	63	1579	3481
	DG125	3100	122	1230	48	1606	63	1679	3701
	DG150	3348	132	1445	57	1875	74	1906	4202
	DG175	3624	143	1626	64	1987	78	2145	4729
	DG200	3624	143	1626	64	1987	78	2145	4729
Sound Attenuated Level-3 Enclosure on Skid Base (Aluminum)*	DG100	3100	122	1230	48	1606	63	1654	3646
	DG125	3100	122	1230	48	1606	63	1754	3866
	DG150	3348	132	1445	57	1875	74	1938	4273
	DG175*	3624	143	1626	64	1987	78	–	–
	DG200*	3624	143	1626	64	1987	78	–	–
Weather Protective Enclosure on Skid Base (Steel)	DG100	2442	96	1297	51	1449	57	1564	3448
	DG125	2442	96	1297	51	1449	57	1664	3668
	DG150	2892	114	1445	57	1875	74	1919	4231
	DG175	3624	143	1626	64	2027	80	2072	4568
	DG200	3624	143	1626	64	2027	80	2072	4568
Sound Attenuated Level-2 Cold Weather Enclosure on Skid Base (Steel)*	DG100	3100	122	1230	48	1606	63	1710	3769
	DG125	3100	122	1230	48	1606	63	1810	3990
	DG150	3348	132	1445	57	1875	74	2057	4535
	DG175	3624	143	1626	64	1987	78	2332	5141
	DG200	3624	143	1626	64	1987	78	2332	5141
Sound Attenuated Level-3 Cold Weather Enclosure on Skid Base (Steel)	DG100	3100	122	1230	48	1606	63	1772	3906
	DG125	3100	122	1230	48	1606	63	1872	4127
	DG150	3349	132	1446	57	1876	74	2091	4610
	DG175*	3624	143	1626	64	1987	78	–	–
	DG200*	3624	143	1626	64	1987	78	–	–

*Preliminary Data – Subject to change without notice.
Weights include Genset, Enclosure (where applicable)





B. Component Weights to Calculate Package Weights

Standby Ratings/ Genset Models	Wide Skid Base		Sound Attenuated Enclosure (L2) (Steel)		Sound Attenuated Enclosure (L2) (Aluminum)		Weather Protective Enclosure		SA Cold Weather Enclosure (L2)	
ekW	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
100 (DG100)	143	315	336 / 400	741 / 881	215 / 290	474 / 639	200	450	346 / 408	763 / 900
125 (DG125)	143	315	336 / 400	741 / 881	215 / 290	474 / 639	200	450	346 / 408	763 / 900
150 (DG150)*	255	515	394 / 428	869 / 944	249 / 281	549 / 620	262	578	400 / 434	882 / 957
175 (DG175)*	273	602	522 / –	1150 / –	365 / -	804 / –	292	643	470 / –	1036 / –
200 (DG200)*	273	602	522 / –	1150 / -	365 / –	804 / –	292	643	470 / –	1036 / –

*Preliminary Data – Subject to change without notice.

C. Enclosure Sound Pressure Levels (SPL) for Sound Attenuated Steel and Aluminum Enclosures

Standby Ratings/ Genset Models	SPL at 7m (23 ft) at 100% load (L2)
ekW	dBA
100 (DG100)	75
125 (DG125)	75
150 (DG150)	75
175 (DG175)	75
200 (DG200)	75

Standby Ratings / Genset Models	SPL at 7m (23 ft) at 100% load (L3)
ekW	dBA
100 (DG100)	70
125 (DG125)	70
150 (DG150)	70
175 (DG175)	70
200 (DG200)	70

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LEHE21113-04 (10/23)

APPENDIX C – CONSTRUCTION HRA MODELING RESULTS

Model
Cancer Risk
Chronic Risk

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Maximum Cancer Risk by Pollutant at PMI, MEIR, MEIW and Sensitive Receptor
Bowerman RNG Facility - Construction - Elevated Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	71	receptor #	2515	receptor #	2565
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,984.28	3,731,366.25	431,460.77	3,730,680.05	433,119.45	3,731,289.08
		1-Year Cancer Risk	Contribution (%)	1-Year Cancer Risk	Contribution (%)	1-Year Cancer Risk	Contribution (%)
-	ALL	1.64E-05	100%	6.88E-06	100%	2.19E-07	100.00%
9901	DPM	1.64E-05	100.00%	6.88E-06	100.00%	2.19E-07	100.00%

Yorke ENGINEERING, LLC
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Cancer Risk by Source for All Pollutants Combined at PMI, MEIR, MEIW and Sensitive Receptor
Bowerman RNG Facility - Construction - Elevated Terrain AERMOD Run

Sources	Source Description	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	71	receptor #	2515	receptor #	2565
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,984.28	3,731,366.25	431,460.77	3,730,680.05	433,119.45	3,731,289.08
		1-Year Cancer Risk	Contribution (%)	1-Year Cancer Risk	Contribution (%)	1-Year Cancer Risk	Contribution (%)
ALL	--	1.64E-05	100%	6.88E-06	100%	2.19E-07	100%
PIPELINE	Pipeline Construction	1.45E-05	88.08%	6.80E-06	98.76%	1.90E-07	86.66%
RNG_FAC	Renewable Natural Gas Facility Construction	1.96E-06	11.92%	8.50E-08	1.24%	2.92E-08	13.34%

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Maximum Chronic Hazard Index by Pollutant at PMI, MEIR, MEIW and Sensitive Receptor
Bowerman RNG Facility - Construction - Elevated Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	71	receptor #	2515	receptor #	2565
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,984.28	3,731,366.25	431,460.77	3,730,680.05	433,119.45	3,731,289.08
		Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)
-	ALL	1.85E-02	100.00%	7.74E-03	100.00%	3.02E-03	100.00%
9901	DPM	1.85E-02	100.00%	7.74E-03	100.00%	3.02E-03	100.00%

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Chronic Hazard Index by Source for All Pollutants Combined at PMI, MEIR, MEIW and Sensitive Receptor
Bowerman RNG Facility - Construction - Elevated Terrain AERMOD Run

Sources	Source Description	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	71	receptor #	2515	receptor #	2565
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,984.28	3,731,366.25	431,460.77	3,730,680.05	433,119.45	3,731,289.08
		Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)
ALL	--	1.85E-02	100%	7.74E-03	100%	3.02E-03	100%
PIPELINE	Pipeline Construction	1.63E-02	88.08%	7.64E-03	98.76%	2.62E-03	86.66%
RNG_FAC	Renewable Natural Gas Facility Construction	2.20E-03	11.92%	9.56E-05	1.24%	4.03E-04	13.34%

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Maximum Cancer Risk by Pollutant at PMI, MEIR, and MEIW
FRB Landfill RNG Facility - Construction - Flat Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	71	receptor #	2515	receptor #	2565
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,984	3,731,366	431,461	3,730,680	433,119	3,731,289
		1-Year Cancer Risk	Contribution (%)	1-Year Cancer Risk	Contribution (%)	1-Year Cancer Risk	Contribution (%)
-	ALL	1.69E-05	100%	7.03E-06	100%	2.59E-07	100%
9901	DPM	1.69E-05	100.00%	7.03E-06	100.00%	2.59E-07	100.00%

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Cancer Risk by Source for All Pollutants Combined at PMI, MEIR, and MEIW
FRB Landfill RNG Facility - Construction - Flat Terrain AERMOD Run

Sources	Source Description	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	71	receptor #	2515	receptor #	2565
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,984	3,731,366	431,461	3,730,680	433,119	3,731,289
		1-Year Cancer Risk	Contribution (%)	1-Year Cancer Risk	Contribution (%)	1-Year Cancer Risk	Contribution (%)
ALL	--	1.69E-05	100%	7.03E-06	100%	2.59E-07	100%
PIPELINE	Pipeline Construction	1.51E-05	89.21%	6.93E-06	98.63%	2.26E-07	87.30%
RNG_FAC	Renewable Natural Gas Facility Construction	1.83E-06	10.79%	9.60E-08	1.37%	3.29E-08	12.70%

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Maximum Chronic Hazard Index by Pollutant at PMI, MEIR, MEIW and Sensitive Receptor
FRB Landfill RNG Facility - Construction - Flat Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	71	receptor #	2515	receptor #	2565
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,984	3,731,366	431,461	3,730,680	433,119	3,731,289
		Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)
-	ALL	1.91E-02	100%	7.90E-03	100%	3.58E-03	100%
9901	DPM	1.91E-02	100.00%	7.90E-03	100.00%	3.58E-03	100.00%

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Chronic Hazard Index by Source for All Pollutants Combined at PMI, MEIR, MEIW and Sensitive Receptor
FRB Landfill RNG Facility - Construction - Flat Terrain AERMOD Run

Sources	Source Description	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	71	receptor #	2515	receptor #	2565
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,984	3,731,366	431,461	3,730,680	433,119	3,731,289
		Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)
ALL	--	1.91E-02	100%	7.90E-03	100%	3.58E-03	100%
PIPELINE	Pipeline Construction	1.70E-02	89.21%	7.79E-03	98.63%	3.13E-03	87.30%
RNG_FAC	Renewable Natural Gas Facility Construction	2.06E-03	10.79%	1.08E-04	1.37%	4.55E-04	12.70%

APPENDIX D – EMISSION CALCULATIONS FROM OPERATIONS

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RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Thermal Oxidizer Unit

Table D.1 Data (Thermal Oxidizer)

Stream ID[1]	Stream Max Capacity[1] (scfm)	Methane Content in Tail Gas Stream[1] (Vol.%)	Stream Max Capacity[2] (mmBtu/hr)	Stream HHV[3] (mmBtu/mmscf)	Hours per Day	Days per Year	Stream Consumption[4] (mmscf/hr)	Stream Max Consumption[5] (mmscf/yr)
Plant Inlet	6,000	--	--	--	24	365	0.3600	3,153.60
Tail Gas Stream 1	2,315	4.36%	6.36	45.78			0.1389	1,216.76
Tail Gas Stream 2	885	10.96%	6.11	115.08			0.0531	465.16
Supplemental Fuel	280	--	17.64	--			0.0168	147.17
Normal Operations Total Heat Input (mmBtu/hr)			30.1					
Start-Up TG Stream 1	1,100	40.00%	27.7	420.00			0.0660	0.00
Start-Up Suppl. Fuel	83	--	5.2	--			0.0050	0.00
Start-Up Total Heat Input (mmBtu/hr)			32.9					

[1] Plant Inlet flowrate and Tail Gas Stream 1 and 2 flowrates and methane content from TOU and Flare Gases PFD in Appendix B. Supplemental Fuel flowrate from Perennial.

[2] Tail Gas Stream 1, Tail Gas Stream 2

Stream Max Capacity (mmBtu/hr) = Stream Max Capacity (scfm) x Methane Content in Tail Gas Stream (Vol.%) x 60 / 1,000,000 x NG HHV (mmBtu/mmscf)

NG HHV 1,050 mmBtu/mmscf

Supplemental Fuel

Stream Max Capacity (mmBtu/hr) = Stream Max Capacity (scfm) x 60 / 1,000,000 x NG HHV (mmBtu/mmscf)

[3] Stream HHV (mmBtu/mmscf) = Stream Max Capacity (mmBtu/hr) / (Stream Max Capacity (scfm) x 60 / 1,000,000)

[4] Stream Consumption (mmscf/h) = Stream Max Capacity (scfm) x 60 / 1,000,000

[5] Stream Consumption (mmscf/yr) = Stream Max Capacity (mmscf/hr) x Hours per Day x Days per Year

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RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Thermal Oxidizer Unit

Table D.2 Thermal Oxidizer Criteria Pollutant Emission Factors and Emissions

Criteria Pollutant	Plant Inlet (ppmv)	Exhaust Content (ppmv @ 3% O2)	Emission Factor[6] (lb/mmscf)	Emission Factor[7] (lb/mmBtu)	Hourly Emissions[8] (lb/hr)	Daily Emissions[9] (lb/day)	Annual Emissions[10] (lb/yr)	Monthly Emissions[11] (lb/mo)	30-Day Average Emissions[12] (lb/30-day)
NOx[1]	--	29	--	0.035	1.0538	25.29	9,231.60	769.30	25.64
CO[2]	--	106	--	0.080	2.4088	57.81	21,100.80	1,758.40	58.61
VOC[3]	--	--	--	0.006	0.1807	4.34	1,582.56	131.88	4.40
SOx, Tail Gas[4]	85	--	14.354	--	5.1673	124.01	--	--	--
	60	--	10.132	--	3.6475	87.54	31,952.04	2,662.67	88.76
SOx, Supplemental Fuel[4]	--	--	0.60	--	0.0101	0.24	88.30	7.36	0.25
PM10[5]	--	--	7.5	0.007	0.2151	5.16	1,884.00	157.00	5.23

[1] NOx emission factor from Rule 1147, Table 2, "Afterburner, Degassing Unit, Thermal Oxidizer, Catalytic Oxidizer or Vapor Incinerator," is 0.024 lb/MMBTU/hr when combusting only natural gas as the supplemental fuel.
The emission limit is proposed to be 0.035 lb NOx/MMBTU, as the BACT/LAER limit for a RNG Processing Plant that burns low-BTU tail gases in addition to the supplemental fuel of natural gas.
[Exhaust Content (ppmv @ 3% O2)]

[2] CO emission factor from equipment specification sheet design criteria. Reference is provided in Appendix B.
The emission limit is proposed to be 0.080 lb NOx/MMBTU, as the BACT/LAER limit for a RNG Processing Plant that burns low-BTU tail gases in addition to the supplemental fuel of natural gas.
[Exhaust Content (ppmv @ 3% O2)]

[3] Proposed BACT/LAER for VOC is the South Coast AQMD BACT/LAER determination for A/N 614468 [Flare I-6 AT OCWR, FRB (Facility ID 69646)].
[Emission Factor (lb/mmBtu)]

[4] Tail Gas
The South Coast AQMD BACT/LAER determination for A/N 614468 requires sulfur content no higher than: 85 ppmv, averaged daily; and 60 ppmv, averaged monthly.
These values are used for the Tail Gas emission calculations.
[Plant Inlet (ppmv)]
Supplemental Fuel
South Coast AQMD Default
[lb/mmscf]

[5] Proposed Emission Factor for PM10 is derived from the South Coast AQMD default emission factor for external combustion.
[Emission Factor (lb/mmBtu)]

[6] SOx, Tail Gas
Emission Factor (lb/mmscf) = Plant Inlet (ppmv) x SOx MW (lb/lbmol) / Molar Volume (scf/lbmol)

SOx MW	64	lb/lbmol
Molar Volume	379	scf/lbmol, @ 60 Deg F

[7] NOx, CO
Emission Factor (lb/mmBtu) = Exhaust Content (ppmv @ 3% O2) x 20.9 / (20.9 - 3) x F-Factor (dscf/mmBtu) x MW / Molar Volume / 1,000,000

F-Factor	8,710	dscf/mmBtu
NOx MW	46	
CO MW	28	

[8] NOx, CO, VOC, PM10
Hourly Emissions (lb/hr) = Emission Factor (lb/mmBtu) x Total Heat Input (mmBtu/hr)
SOx, Tail Gas
Hourly Emissions (lb/hr) = Emission Factor (lb/mmscf) x Plant Inlet (mmscf/hr)
SOx, Supplemental Fuel
Hourly Emissions (lb/hr) = Emission Factor (lb/mmscf) x Supplemental Fuel (mmscf/hr)

[9] Daily Emissions (lb/day) = Hourly Emissions (lb/hr) x Hours per Day

[10] Annual Emissions (lb/yr) = Hourly Emissions (lb/hr) x Hours per Day x Days per Year

[11] Monthly Emissions (lb/mo) = Annual Emissions (lb/yr) / 12

[12] 30-Day Average Emissions (lb/30-day) = Monthly Emissions (lb/mo) / 30

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RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Thermal Oxidizer Unit

Table D.3 **AQIA Emission Rates - (Continuous Operation - emission rates constant among averaging times)**

	1-Hour Averaging Period		8-Hour Averaging Period		24-Hour Averaging Period		Annual Averaging Period	
Pollutant	**lb/hr[1]**	**g/s[2]**	**lb/8-hr[3]**	**g/s[4]**	**lb/24-hr[5]**	**g/s[6]**	**lb/yr[7]**	**g/s[8]**
NO2	1.054E+00	1.329E-01	--	--	--	--	9.23E+03	1.329E-01
SO2	5.177E+00	6.529E-01	--	--	1.243E+02	6.529E-01	3.20E+04	4.613E-01
CO	2.409E+00	3.038E-01	1.927E+01	3.038E-01	--	--	--	--
PM10	--	--	--	--	5.162E+00	2.712E-02	1.88E+03	2.712E-02
PM2.5	--	--	--	--	5.162E+00	2.712E-02	1.88E+03	2.712E-02

[1] 1-Hour Averaging Period (lb/hr) = Emission Rate (lb/hr)
[2] 1-Hour Averaging Period (g/s) = 1-Hour Averaging Period (lb/hr) x 454 / 3,600
[3] 8-Hour Averaging Period (lb/8-hr) = 1-Hour Averaging Period (lb/hr) x 8 Hours
[4] 8-Hour Averaging Period (g/s) = 8-Hour Averaging Period (lb/8-hr) / 8 Hours x 454 / 3,600
[5] 24-Hour Averaging Period (lb/24-hr) = 1-Hour Averaging Period (lb/hr) x 24 Hours
[6] 24-Hour Averaging Period (g/s) = 24-Hour Averaging Period (lb/24-hr) / 24 Hours x 454 / 3,600
[7] Annual Averaging Period (lb/yr) = 1-Hour Averaging Period (lb/hr) x 24 hours x 365 days
[8] Annual Averaging Period (g/s) = Annual Averaging Period (lb/yr) / 8,760 Hours x 454 / 3,600

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RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Thermal Oxidizer Unit

Table D.4 Thermal Oxidizer Toxic Air Contaminant Emission Factors and Emissions

Toxic Air Contaminant	CAS No.	Molecular Weight (lb/lbmol)	Tail Gas 1 Inlet Concentration[1] (ppbv)	Tail Gas 1 Emission Factor[2] (lb/mmscf)	Natural Gas Emission Factor[3] (lb/mmscf)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (lb/yr)	
Vinyl Chloride	75014	62.5	271	8.94E-04	--	1.24E-04	1.09E+00	V4
1,1-Dichloroethene	75354	96.94	34.3	1.75E-04	--	2.44E-05	2.13E-01	V5
Methylene Chloride	75092	84.93	1203	5.39E-03	--	7.49E-04	6.56E+00	M13
1,1-Dichloroethane	75343	98.96	30.5	1.59E-04	--	2.21E-05	1.94E-01	D6
Chloroform	67663	119.38	8	5.04E-05	--	7.00E-06	6.13E-02	C11
1,2-Dichloroethane	107062	98.96	364	1.90E-03	--	2.64E-04	2.31E+00	E6
1,1,1-Trichloroethane	71556	133.4	16.9	1.19E-04	--	1.65E-05	1.45E-01	M8
Benzene	71432	78.11	3680	1.52E-02	5.80E-03	2.27E-03	1.99E+01	B1
Trichloroethylene	79016	131.4	207	1.44E-03	--	1.99E-04	1.75E+00	T8
Toluene	108883	92.14	12901	6.27E-02	2.65E-02	9.47E-03	8.30E+01	T3
Tetrachloroethene	127184	165.83	671	5.87E-03	--	8.16E-04	7.14E+00	P2
Chlorobenzene	108907	112.56	8062	4.79E-02	--	6.65E-03	5.83E+01	C10
Xylenes	1330207	106.16	8735	4.89E-02	1.97E-02	7.36E-03	6.45E+01	X1
Formaldehyde	50000	--	--	--	1.23E-02	3.53E-04	3.09E+00	F2
Total PAHs (excluding	1151	--	--	--	1.00E-04	2.87E-06	2.51E-02	P41
Naphthalene	91203	--	--	--	3.00E-04	8.60E-06	7.54E-02	P62
Acetaldehyde	75070	--	--	--	3.10E-03	8.89E-05	7.79E-01	A1
Acrolein	107028	--	--	--	2.70E-03	7.74E-05	6.78E-01	A3
Ammonia	7664417	--	--	--	3.20E+00	9.18E-02	8.04E+02	A9
Ethyl Benzene	100414	--	--	--	6.90E-03	1.98E-04	1.73E+00	E3
Hexane	110543	--	--	--	4.60E-03	1.32E-04	1.16E+00	H6

Stream ID	Component	Flowrate (scfm)
Tail Gas Stream 1	Total	2,315
	CH_4	100.93
Tail Gas Stream 2	CH_4	97.00
Supplemental Fuel	--	280

Tail Gas 1 Flowrate (scfm)	2,315
Natural Gas Flowrate (scfm)	477.93

[1] Tail Gas 1 Inlet Concentration (ppbv) from June 2022 LFG analysis.

[2] Tail Gas 1 Emission Factor (lb/mmscf) = Tail Gas 1 Inlet Concentration (ppbv) / 1,000 x Molecular Weight (lb/lbmol) / Molar Volume (scf/lbmol) x [1 - Control Efficiency (%)]

Molar Volume 379 scf/lbmol, @ 60 Deg F

Control Efficiency 98% Rule 1150.1

[3] TAC calculations assume that emissions from the methane component of the tail gas streams may be calculated from the default emission factors for natural gas combustion.
Emission Factors are from South Coast AQMD Default Emission Factors for Natural Gas Combustion in External Combustion Equipment rated between 10 and 100 mmBtu/hr

[4] Hourly Emissions (lb/hr) = Tail Gas 1 Emission Factor (lb/mmscf) x Tail Gas 1 Flowrate (scfm) x 60 / 1,000,000 + Natural Gas Emission Factor (lb/mmscf) x Natural Gas Flowrate (scfm) x 60 / 1,000,000

[5] Annual Emissions (lb/yr) = Hourly Emissions (lb/hr) x Hours per Day x Days per Year

Hours per Day 24

Days per Year 365

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Appendix D Operational Emissions - Thermal Oxidizer Unit

Table D.5 Thermal Oxidizer GHG Emission Factors and Emissions

Stream ID[1]	Stream Max Capacity[1] (scfm)	Component	Component Vol.%	Component Flowrate[2] (scfm)	GHG	Emission Factor[3] (lb/mmBtu)	Emission Factor[4] (lb/mmscf)	Annual Emissions[5] (lb/yr)	Daily Emissions (lb/day)	MT/yr	CO2e Eq[1]	CO2e[4] (MT/yr)
Tail Gas Stream 1	2,315	CH_4	4.36%	100.93	CH_4	2.2E-03	2.31	122.55	0.34	0.06	25	1.39
					N_2O	2.20E-04	0.23	12.25	0.03	0.01	298	1.66
Tail Gas Stream 2	885	CH_4	10.96%	97.00	CH_4	2.2E-03	2.31	117.77	0.32	0.05	25	1.34
					N_2O	2.20E-04	0.23	11.78	0.03	0.01	298	1.59
Supplemental Fuel	280	--	--	--	CO_2	1.17E+02	122,787.00	18,070,317.22	49,507.72	8,195.16	1	8,195.16
					CH_4	2.2E-03	2.31	339.96	0.93	0.15	25	3.85
					N_2O	2.20E-04	0.23	34.00	0.09	0.02	298	4.59
										Total CO2e (MT/yr)		8,209.58

Tail Gas Stream 1 and 2 flowrates and composition from Material Balance in Appendix B. Supplemental Fuel flowrate from Perennial.

[1] All carbon dioxide derived from LFG is considered biogenic and does not result in a net increase in atmospheric carbon dioxide. All methane and N2O emissions are anthropogenic and are net increases in atmospheric GHG. Thus, for the tail gas streams, the combustion byproducts of methane and nitrous oxide are included in this analysis but carbon dioxide, both as a component of the tail gas streams and formed from combustion, are excluded.

[2] Component Flowrate (scfm) = Stream Max Capacity (scfm) x Component Vol.%

[3] GHG calculations assume that emissions from the methane component of the tail gas streams may be calculated from the default emission factors for natural gas combustion.
Emission factors and CO2e Eq are from SCAQMD 'Combustion Emission Estimator'.
http://www.aqmd.gov/docs/default-source/permitting/ceqa-2017/ghg-estimator-(2018-11).xlsx?sfvrsn=6

[4] CO_2, Tail Gas
The CO_2 in the tail gas streams passes through the thermal oxidizer.
Emission Factor (lb/mmscf) = Density (lb/scf) x 1,000,000
Density (lb/scf) = MW / Molar Volume

CO_2 MW	44.01	lb/lbmol
Molar Volume	379	scf/lbmol, @ 60 Deg F

CH_4 / Supplemental Fuel
Emission Factor (lb/mmscf) = Emission Factor (lb/mmBtu) x HHV (mmBtu/mmscf)

HHV	1,050	mmBtu/mmscf

[5] Tail Gas
Annual Emissions (lb/yr) = Component Flowrate (scfm) x 60 / 1,000,000 x Hours per Day x Days per Year x Emission Factor (lb/mmscf)
Supplemental Fuel
Annual Emissions (lb/yr) = Stream Max Capacity (scfm) x 60 / 1,000,000 x Hours per Day x Days per Year x Emission Factor (lb/mmscf)

Hours per Day	24
Days per Year	365

[6] CO2e (MT/yr) = Annual Emissions (lb/yr) x CO2e Eq / 2,205

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Appendix D Operational Emissions - Off-Spec Flare

Table D.6 Data (Flare)

Flare Equipment	Stream Max Capacity[1] (scfm)	Stream Max Capacity[1] (mmbtu/hr)	Hours per Day	Annual Capacity Factor (%)	Hours per Year[2]	Gas Consumption[3] (mmscf/hr)	Gas Consumption[4] (mmscf/yr)
Pilot Gas (Natural Gas)	1.59	0.1	24	100%	8760	0.0000952	0.8343
Total Heat Input (mmbtu/hr)	0.1			Total Gas Consumption (mmscf/hr)		0.00010	

[1] Pilot Gas Stream Max Capacity (mmBtu/hr) from Perennial (Appendix B).
Pilot Gas (Natural Gas)
Stream Max Capacity (scfm) = Stream Max Capacity (mmBtu/hr) / 60 / NG HHV (mmBtu/mmscf) x 1,000,000
NG HHV 1,050 mmbtu/mmscf
[2] Hours per Year = 24 Hours per Day x 365 Days per Year x Annual Capacity Factor (%)
[3] Gas Consumption (mmscf/hr) = Stream Max Capacity (scfm) x 60 min/hr / 1,000,000
[4] Gas Consumption (mmscf/yr) = Gas Consumption (mmscf/hr) x Hours per Day x Days per Year

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RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Off-Spec Flare

Table D.7 Flare Criteria Pollutant Emission Factors and Emissions

Criteria Pollutant	Flare Gas Content (ppmv)	Emission Factor[3] (lb/mmscf)	Emission Factor (lb/mmbtu)	Hourly Emissions[5] (lb/hr)	Daily Emissions[6] (lb/day)	Annual Emissions[7] (lb/yr)	Monthly Emissions[8] (lb/mo)	30-Day Average Emissions[9] (lb/30-day)
NOx[1]	--	--	0.06	0.0060	0.14	52.56	4.46	0.15
CO[2]	--	--	0.06	0.0060	0.14	52.56	4.46	0.15
VOC[2]	--	--	0.006	0.0006	0.01	5.26	0.45	0.01
SOx[3]	--	0.60	--	0.0001	0.001	0.50	0.04	0.001
PM10[4]	--	6.1	--	0.0006	0.01	5.09	0.43	0.01

[1] NOx emission factor from Rule 1118.1, Table 1, for "Other Flare Gas." The flare manufacturer has guaranteed that the flare will operate in compliance with this emission limit.

[2] The VOC and CO emission factors are the South Coast AQMD BACT/LAER determination for A/N 614468.

[3] Pilot Gas
South Coast AQMD Default

[4] The PM10 emission factor is the South Coast AQMD BACT/LAER determination for A/N 614468.

[5] NOx, CO, and VOC
Hourly Emissions (lb/hr) = Emission Factor (lb/mmBtu) x Total Heat Input (mmBtu/hr)
SOx, Flare Gas
Hourly Emissions (lb/hr) = Emission Factor (lb/mmscf) x Flare Gas Consumption (mmscf/hr)
SOx, Pilot Gas
Hourly Emissions (lb/hr) = Emission Factor (lb/mmscf) x Pilot Gas Consumption (mmscf/hr)
PM10
Hourly Emissions (lb/hr) = Emission Factor (lb/mmscf) x Total Gas Consumption (mmscf/hr)

[6] Daily Emissions (lb/day) = Hourly Emissions (lb/hr) x Hours per Day

[7] Annual Emissions (lb/yr) = Hourly Emissions (lb/hr) x Hours per Year

[8] Monthly Emissions (lb/mo) = Hourly Emissions (lb/hr) x 24 Hours per Day x 31 Days per Month [less than 876 hours (maximum annual hours)]

[9] 30-Day Average Emissions (lb/30-day) = Monthly Emissions (lb/mo) / 30

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Off-Spec Flare

Table D.8 **AQIA Emission Rates**

	1-Hour Averaging Period		8-Hour Averaging Period		24-Hour Averaging Period		Annual Averaging Period	
Pollutant	**lb/hr[1]**	**g/s[2]**	**lb/8-hr[3]**	**g/s[4]**	**lb/24-hr[5]**	**g/s[6]**	**lb/yr[7]**	**g/s[8]**
NO2	6.000E-03	7.567E-04	--	--	--	--	5.256E+01	7.567E-04
SO2	5.714E-05	7.206E-06	--	--	1.371E-03	7.206E-06	5.006E-01	7.206E-06
CO	6.000E-03	7.567E-04	4.800E-02	7.567E-04	--	--	--	--
PM10	--	--	--	--	1.394E-02	7.326E-05	5.089E+00	7.326E-05
PM2.5	--	--	--	--	1.394E-02	7.326E-05	5.089E+00	7.326E-05

[1] 1-Hour Averaging Period (lb/hr) = Emission Rate (lb/hr)
[2] 1-Hour Averaging Period (g/s) = 1-Hour Averaging Period (lb/hr) x 454 / 3,600
[3] 8-Hour Averaging Period (lb/8-hr) = 1-Hour Averaging Period (lb/hr) x 8 Hours
[4] 8-Hour Averaging Period (g/s) = 8-Hour Averaging Period (lb/8-hr) / 8 Hours x 454 / 3,600
[5] 24-Hour Averaging Period (lb/24-hr) = 1-Hour Averaging Period (lb/hr) x 24 Hours
[6] 24-Hour Averaging Period (g/s) = 24-Hour Averaging Period (lb/24-hr) / 24 Hours x 454 / 3,600
[7] Annual Averaging Period (lb/yr) = 1-Hour Averaging Period (lb/hr) x Annual Hours of Opeation :
Annual Operating Hours 8,760
[8] Annual Averaging Period (g/s) = Annual Averaging Period (lb/yr) / 8,760 Hours x 454 / 3,600

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Off-Spec Flare

Table D.9 Flare Toxic Air Contaminant Emission Factors and Emissions

Toxic Air Contaminant	CAS No.	Emission Factor[1] (lb/mmscf)	Hourly Emissions Controlled[2] (lb/hr)	Annual Emissions Controlled[3] (lb/yr)	
Benzene	71432	0.159	1.51E-05	1.33E-01	B1
Ethylbenzene	100414	1.444	1.38E-04	1.20E+00	E3
Hexane	110543	0.029	2.76E-06	2.42E-02	H6
Toluene	108883	0.058	5.52E-06	4.84E-02	T3
Xylenes	1330207	0.029	2.76E-06	2.42E-02	X1
Formaldehyde	50000	1.169	1.11E-04	9.75E-01	F2
Acetaldehyde	75070	0.043	4.10E-06	3.59E-02	A1
Acrolein	107028	0.01	9.52E-07	8.34E-03	A3
Naphthalene	91203	0.011	1.05E-06	9.18E-03	P62
Total PAH (excluding Naphthalene)	1151	0.003	2.86E-07	2.50E-03	P41

Gas Consumption (mmscf/hr)	Gas Consumption (mmscf/yr)
0.0001	0.8343

[1] Emission Factors are from South Coast AQMD Default Emission Factors for Natural Gas Combustion in Flare
[2] Hourly Emissions (lb/hr) = Emission Factor (lb/mmscf) x Gas Consumption (mmscf/hr)
[3] Annual Emissions (lb/yr) = Emission Factor (lb/mmscf) x Gas Consumption (mmscf/yr)

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Off-Spec Flare

Table D.10 Flare GHG Emission Factors and Emissions

GHG	Emission Factor[1] (lb/mmBtu)	Emission Factor[2] (lb/mmscf)	Gas Consumption (mmscf/yr)	Daily Emissions (lb/day)	Annual Emissions[3] (lb/yr)	MT/yr	CO2e Eq[1]	CO2e[4] (MT/yr)
CO_2	116.94	122,787	0.83	280.66	102,439.44	46.46	1	46.46
CH_4	2.200E-03	2.31		0.0053	1.93	0.00	25	0.02
N_2O	2.200E-04	0.23		0.0005	0.19	0.00	298	0.03
							Total CO2e (MT/yr)	46.51

[1] Emission factors and CO2e Eq are from SCAQMD 'Combustion Emission Estimator'.
http://www.aqmd.gov/docs/default-source/permitting/ceqa-2017/ghg-estimator-(2018-11).xlsx?sfvrsn=6
Fuel Type: Natural Gas

[2] Emission Factor (lb/mmscf) = Emission Factor (lb/mmBtu) x HHV (mmBtu/mmscf)
HHV 1,050 mmBtu/mmscf

[3] Annual Emissions (lb/yr) = Emission Factor (lb/mmscf) x LFG Max Consumption (mmscf/yr)

[4] CO2e (MT/yr) = Annual Emissions (lb/yr) x CO2e Eq / 2,205

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Generator Set with ICE

Table D.11 Data (Emergency ICE)

Engine Rating[1] (hp)	Fuel Consumption[1] (scf/hr)	Hours per Day / Hours per Month (M&T)	Hours per Year (M&T)	Fuel Consumption[2] (mmscf/hr)	Fuel Consumption[3] (mmscf/yr)
253	1,655	4.2	50	0.001655	0.0827

[1] Engine Rating (hp) and Fuel Consumption (scf/hr) from manufacturer's specification at 100% load.
Fuel Consumption (scf/hr) = Fuel Consumption (scf/hr) @ 905 mmBtu/mmscf x 905 mmBtu/mmscf / NG HHV (mmBtu/mmscf)

Fuel Consumption	1,920	scf/hr, @ 905 mmBtu/mmscf and 32 scfm at 100% load
NG HHV	1,050	mmBtu/mmscf

[2] Fuel Consumption (mmscf/hr) = Fuel Consumption (scf/hr) / 1,000,000
[3] Fuel Consumption (mmscf/yr) = Fuel Consumption (mmscf/hr) x Hours per Year (M&T)

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Generator Set with ICE

Table D.12 Emergency ICE Criteria Pollutant Emission Factors and Emissions

Criteria Pollutant	EPA Certified Emissions (g/bhp-hr)	Emission Factor (lb/mmscf)	Hourly Emissions[3] (lb/hr)	Daily Emissions[4] (lb/day)	Annual Emissions[5] (lb/yr)	Monthly Emissions[6] (lb/mo)	30-Day Average Emission[7] (lb/30-day)
NOx[1]	0.3	--	0.1672	0.70	8.36	0.70	0.02
CO[1]	0.5	--	0.2786	1.17	13.93	1.17	0.04
VOC[1]	0.049	--	0.0273	0.11	1.37	0.11	0.004
SOx[2]	--	0.60	0.0010	0.004	0.05	0.004	0.0001
PM10[2]	--	10	0.0165	0.07	0.83	0.07	0.002

[1] Certification Emission Levels (g/bhp-hr) for EPA Family PORGB10.3ET1 from
https://www.epa.gov/system/files/documents/2024-02/large-spark-ignition-2011-present.xlsx
Note: VOC is shown as 0.0 g/bhp-hr. Emission calculations assume 0.049 g/bhp-hr.
Horsepower Rating and Fuel Consumption from Gas Engine Technical Data Sheet, Caterpillar DG 150 ICE, at 100% load with no fan

[2] South Coast AQMD Default Emission Factor (lb/mmscf) for Natural Gas Combustion in Internal Combustion Engine

[3] NOx, CO, and VOC
Hourly Emissions (lb/hr) = EPA Certified Emissions (g/bhp-hr) x Engine Rating (bhp) / 454 g/lb
SOx and PM10
Hourly Emissions (lb/hr) = Emission Factor (lb/mmscf) x Fuel Consumption (mmscf/hr)

[4] Daily Emissions (lb/day) = Hourly Emissions (lb/hr) x Hours per Day

[5] Annual Emissions (lb/yr) = Hourly Emissions (lb/hr) x Hours per Year

[6] Monthly Emissions (lb/mo) = Hourly Emissions (lb/hr) x Hours per Month

[7] 30-Day Average Emissions (lb/30-day) = Monthly Emissions (lb/mo) / 30

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Generator Set with ICE

Table D.13 **AQIA Emission Rates**

	1-Hour Averaging Period		8-Hour Averaging Period		24-Hour Averaging Period		Annual Averaging Period	
Pollutant	**lb/hr[1]**	**g/s[2]**	**lb/8-hr[3]**	**g/s[4]**	**lb/24-hr[5]**	**g/s[6]**	**lb/yr[7]**	**g/s[8]**
NO2	1.672E-01	2.108E-02	--	--	--	--	8.359E+00	1.203E-04
SO2	9.929E-04	1.252E-04	--	--	4.170E-03	2.191E-05	4.965E-02	7.147E-07
CO	2.786E-01	3.514E-02	1.170E+00	1.845E-02	--	--	--	--
PM10	--	--	--	--	6.950E-02	3.652E-04	8.274E-01	1.191E-05
PM2.5	--	--	--	--	6.950E-02	3.652E-04	8.274E-01	1.191E-05

[1] 1-Hour Averaging Period (lb/hr) = Emission Rate (lb/hr)
[2] 1-Hour Averaging Period (g/s) = 1-Hour Averaging Period (lb/hr) x 454 / 3,600
[3] 8-Hour Averaging Period (lb/8-hr) = 1-Hour Averaging Period (lb/hr) x Daily/Monthly M&T Hours
Daily/Monthly Maintenance & Testing Hours 4.2
[4] 8-Hour Averaging Period (g/s) = 8-Hour Averaging Period (lb/8-hr) / 8 Hours x 454 / 3,600
[5] 24-Hour Averaging Period (lb/24-hr) = 1-Hour Averaging Period (lb/hr) x Daily/Monthly M&T Hours
[6] 24-Hour Averaging Period (g/s) = 24-Hour Averaging Period (lb/24-hr) / 24 Hours x 454 / 3,600
[7] Annual Averaging Period (lb/yr) = 1-Hour Averaging Period (lb/hr) x Annual Maintenance & Testing Hours
Annual Maintenance & Testing Hours 50
[8] Annual Averaging Period (g/s) = Annual Averaging Period (lb/yr) / 8,760 Hours x 454 / 3,600

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Generator Set with ICE

Table D.14 Emergency ICE Toxic Air Contaminant Emission Factors and Emissions

Toxic Air Contaminant	CAS No.	Emission Factor Uncontrolled[1] (lb/mmscf)	Hourly Emissions Controlled[2] (lb/hr)	Annual Emissions Controlled[3] (lb/yr)
Benzene	71432	1.61	2.66E-03	1.33E-01
1,3-Butadiene	106990	0.676	1.12E-03	5.59E-02
Carbon Tetrachloride	56235	0.0181	3.00E-05	1.50E-03
Ethylene Dibromide	106934	0.0217	3.59E-05	1.80E-03
1,2-Dichloroethane	107062	0.0115	1.90E-05	9.52E-04
Formaldehyde	50000	20.9	3.46E-02	1.73E+00
Methylene Chloride	75092	0.042	6.95E-05	3.48E-03
Benz(a)anthracene	56553	0	0.00E+00	0.00E+00
Benzo(a)pyrene	50328	0	0.00E+00	0.00E+00
Benzo(b)fluoranthene	205992	0	0.00E+00	0.00E+00
Benzo(k)fluoranthene	207089	0	0.00E+00	0.00E+00
Chrysene	218019	0	0.00E+00	0.00E+00
Indeno(1,2,3-c,d)pyrene	193395	0	0.00E+00	0.00E+00
Naphthalene	91203	0.099	1.64E-04	8.19E-03
Acetaldehyde	75070	2.85	4.72E-03	2.36E-01
Acrolein	107028	2.68	4.44E-03	2.22E-01
Ammonia	7664417	3.2	5.30E-03	2.65E-01
Chloroform	67663	0.014	2.32E-05	1.16E-03
Ethylbenzene	100414	0.0253	4.19E-05	2.09E-03
n-Hexane	110543	0	0.00E+00	0.00E+00
Methanol	67561	3.12	5.16E-03	2.58E-01
Styrene	100425	0.0121	2.00E-05	1.00E-03
Toluene	108883	0.569	9.42E-04	4.71E-02
Xylene	1330207	0.199	3.29E-04	1.65E-02

Fuel Consumption (mmscf/hr)	Fuel Consumption (mmscf/yr)
0.001655	0.0827

[1] Emission Factors are from South Coast AQMD Default Emission Factors for Natural Gas Combustion in Lean-Burn ICE
[2] Hourly Emissions (lb/hr) = Emission Factor (lb/mmscf) x Hourly Fuel Consumption (mmscf/hr)
[3] Annual Emissions (lb/yr) = Emission Factor (lb/mmscf) x Annual Fuel Consumption (mmscf/yr)

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Operational Emissions

Appendix D Operational Emissions - Generator Set with ICE

Table D.15 Emergency ICE GHG Emission Factors and Emissions

GHG	Emission Factor[1] (lb/mmBtu)	Emission Factor[2] (lb/mmscf)	Fuel Consumption (mmscf/yr)	Daily Emissions (lb/day)	Annual Emissions[3] (lb/yr)	MT/yr	CO2e Eq[1]	CO2e[4] (MT/yr)
CO_2	116.94	122,787.00	0.0827	27.83	10,159.75	4.61	1	4.61
CH_4	2.2E-03	2.31		0.0005	0.19	0.00	25	0.002
N_2O	2.20E-04	0.23		0.0001	0.02	0.00	298	0.003
							Total CO2e (MT/yr)	4.61

[1] Emission factors and CO2e Eq are from SCAQMD 'Combustion Emission Estimator'.
http://www.aqmd.gov/docs/default-source/permitting/ceqa-2017/ghg-estimator-(2018-11).xlsx?sfvrsn=6
Fuel Type: Natural Gas

[2] Emission Factor (lb/mmscf) = Emission Factor (lb/mmBtu) x HHV (mmBtu/mmscf)
HHV 1,050 mmBtu/mmscf

[3] Annual Emissions (lb/yr) = Emission Factor (lb/mmscf) x Fuel Consumption (mmscf/yr)

[4] CO2e (MT/yr) = Annual Emissions (lb/yr) x CO2e Eq / 2,205

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Operational Emissions

Appendix D Baseline Emissions - Flare Station

Table D.16 Flare Data (Flare Station)

Flare ID	LFG Max Capacity (scfm)	LFG Max Capacity (mmBtu/hr)[1]	LFG HHV[2] (mmBtu/mmscf)	Hours per Day	Days per Year	LFG Max Consumption[3] (mmscf/hr)	LFG Max Consumption[4] (mmscf/yr)
Flare Station	6,000	180	550	24	365	0.3600	3,153.60

[1] Prorating I-6 project (A/N 614468) heat rating at 120 mmBtu/hr and fuel rate of 4,000 scfm to 6,000 scfm for baseline comparison
[2] Per Flare I-6 project, A/N 614468.
[3] LFG Max Consumption (mmscf/hr) = LFG Max Capacity (scfm) x 60 min/hr / 1,000,000
[4] LFG Max Consumption (mmscf/yr) = LFG Max Consumption (mmscf/hr) x Hours per Day x Days per Year

Table D.17 Flare I-6 Criteria Pollutant Emission Factors and Emissions

Criteria Pollutant	LFG Content (ppmv)	Emission Factor (lb/mmscf)	Emission Factor (lb/mmBtu)	Hourly Emissions[5] (lb/hr)	Daily Emissions[6] (lb/day)	Annual Emissions[7] (lb/yr)	Monthly Emissions[8] (lb/mo)	30-Day Average Emissions[9] (lb/30-day)
NOx[1]	--	--	0.025	4.5000	108.00	39,420.00	3,285.00	109.50
CO[1]	--	--	0.06	10.8000	259.20	94,608.00	7,884.00	262.80
VOC[2]	--	--	0.006	1.0800	25.92	9,460.80	788.40	26.28
SOx[3]	85	14.354	--	5.1673	124.01	--	--	--
	60	10.132	--	3.6475	87.54	31,952.04	2,662.67	88.76
PM10[4]	--	6.1	--	2.1960	52.70	19,236.96	1,603.08	53.44

[1] NOx and CO emission factors from Rule 1118.1, Table 1. The flare manufacturer has guaranteed that the flares will operate in compliance with these emission limits.
[2] The VOC emission factor is the South Coast AQMD BACT/LAER determination for A/N 614468. The flare manufacturer has guaranteed that the flares will operate in compliance with these emission limits. This emission factor is lower than the 0.038 lb/mmBtu required by Rule 1118.1, Table 1.
[3] The South Coast AQMD BACT/LAER determination for A/N 614468 requires LFG sulfur content no higher than: 85 ppmv, averaged daily; and 60 ppmv, averaged monthly. Hourly and daily emissions are estimated from 85 ppmv; annual, monthly, and 30-day average emissions are estimated from 60 ppmv.
Emission Factor (lb/mmscf) = LFG Content (ppmv) x SOx MW (lb/lbmol) / Molar Volume (scf/lbmol)
SOx MW 64 lb/lbmol
Molar Volume 379 scf/lbmol, @ 60 Deg F
[4] The South Coast AQMD BACT/LAER determination for A/N 614468 requires PM10 emissions to be no higher than 6.1 lb/mmscf.
[5] NOx, CO, and VOC
Hourly Emissions (lb/hr) = Emission Factor (lb/mmBtu) x LFG Max Capacity (mmBtu/hr)
SOx and PM10
Hourly Emissions (lb/hr) = Emission Factor (lb/mmscf) / 1,000,000 x LFG Max Capacity (scfm) x 60 min/hr
[6] Daily Emissions (lb/day) = Hourly Emissions (lb/hr) x Hours per Day
[7] Annual Emissions (lb/yr) = Hourly Emissions (lb/hr) x Hours per Day x Days per Year
[8] Monthly Emissions (lb/mo) = Annual Emissions (lb/yr) / 12
[9] 30-Day Average Emissions (lb/30-day) = Monthly Emissions (lb/mo) / 30

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Operational Emissions

Appendix D Baseline Emissions Flare I-6

Table D.18 Flare I-6 GHG Emission Factors and Emissions (Flare I-6)

GHG[1]	Emission Factor[2] (lb/mmBtu)	Emission Factor[3] (lb/mmscf)	LFG Max Consumption (mmscf/yr)	Annual Emissions[4] (lb/yr)	CO2e Eq2	CO2e[5] (MT/yr)
CH4	7.050E-03	3.878E+00	3,153.60	12,228	25	139
N2O	1.390E-03	7.645E-01		2,411	298	326
					Total CO2e (MT/yr)	464

[1] All carbon dioxide derived from LFG is considered biogenic and does not result in a net increase in atmospheric carbon dioxide. All methane and N_2O emissions are anthropogenic and are net increases in atmospheric GHG. Thus, for the tail gas streams, the combustion byproducts of methane and nitrous oxide are included in this analysis but carbon dioxide, both as a component of the tail gas streams and formed from combustion, are excluded.

[2] Emission factors and CO2e Eq are from SCAQMD 'Combustion Emission Estimator' for LFG.
http://www.aqmd.gov/docs/default-source/permitting/ceqa-2017/ghg-estimator-(2018-11).xlsx?sfvrsn=6

[3] Emission Factor (lb/mmscf) = Emission Factor (lb/mmBtu) x HHV (mmBtu/mmscf)

[4] Annual Emissions (lb/yr) = Emission Factor (lb/mmscf) x LFG Max Consumption (mmscf/yr)

[5] CO2e (MT/yr) = Annual Emissions (lb/yr) x CO2e Eq / 2,205

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Operational Emissions

Appendix D Baseline GHG Comparison

Table D.19 Baseline GHG Comparison

GHGs	Baseline (MT/yr)[1]	Construction (MT/yr)	Operation[1] (MT/yr)	Total[2] (MT/yr)	Expected Net Change in Emissions (MT/yr)	Threshold (MT/yr)	Significance
Anthropogenic CO_2	0	1,174.7	8,394.3	8,433	8,433	–	–
CH_4	6	0.06	0.74	0.74	-4.80	–	–
N_2O	1	0.06	0.06	0.06	-1.03	–	–
R	0	0.4	0.98	0.99	0.99	–	–
Anthropogenic Total (as CO_2e)	464	1,194	8,432	8,472	8,007	10,000	LTS

Sources: SCAQMD 2008b, Yorke 2024 (Appendix D), CalEEMod version 2022.1.1.28.

[1]All carbon dioxide derived from LFG is considered biogenic and does not result in a net increase in atmospheric carbon dioxide. All methane and N2O emissions are anthropogenic and are net increases in atmospheric GHG. Thus, for the tail gas streams, the combustion byproducts of methane and nitrous oxide are included in this analysis but carbon dioxide, both as a component of the tail gas streams and formed from combustion, are excluded.

[2]Total CO_2e emissions comprises annual operational emissions plus construction emissions amortized over 30 years.

APPENDIX E – OPERATIONAL AQIA MODELING RESULTS

Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
RNG Facility CEQA Air Quality Impact Analysis

Appendix E Air Quality Impact Analysis

Source Locations

Facility: Bowerman Power LFG, LLC

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RNG Facility CEQA Air Quality Impact Analysis

Appendix E Air Quality Impact Analysis

Table E.1 Source Parameters

Source ID	Source Description	Source Type	Orientation	UTM E (m)	UTM N (m)	Release Height (ft)	Exit Temperature (Deg F)	Inside Diameter (ft)	Exhaust Flow (acfm)	Exit Velocity (mps)
FLARE[1]	Flare	Point	Vertical	434,255.01	3,730,882.74	50	1,018	11.77	150,000	7.003
ICE	CAT DG150 Backup Generator ICE	Point	Vertical	434,246.91	3,730,967.73	6.15	1,304	0.4167	1,177	43.852
TOU[1]	PEI Thermal Oxidizer - Pilot Gas	Point	Vertical	434,255.52	3,730,894.15	50	1,000	5.6	39,000	8.044

1. FLARE and TOU exit temperature, inside diameter, and exhaust flow rate are provided by Perenial (email 04/23/2024; Appendix B).
2. All other physical source parameters are from Equipment Data sheets (Appendix B).

Facility: Bowerman Power LFG, LLC

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RNG Facility CEQA Air Quality Impact Analysis

Appendix E Air Quality Impact Analysis

Table E.2 Models

Dispersion Modeling
AERMOD v 23132
AERMET v 16216
AERMAP v 18081
Software Interface:
Lakes Environmental Software; AERMOD View™, Version 12.0.0

Facility: Bowerman Power LFG, LLC

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RNG Facility CEQA Air Quality Impact Analysis

Appendix E Air Quality Impact Analysis

Table E.3 Dispersion Model Options/Assumptions

Parameter	Value				Comments
Control Pathway					
Regulatory Options	Default	☒	Non-Default	☐	--
Output Type	Concentration	☒	Dry Deposition	☐	--
	Total Deposition	☐	Wet Deposition	☐	
Depletion Options	Dry Depletion	☐	Wet Depletion	☐	--
	Disable Dry Depletion	☐	Disable Wet Depletion	☐	
Pollutant	Other				--
Averaging Time Options	1-Hour (H1H); 8-Hour (H1H); 24-Hour (H1H); Annual (Avg)				Model output also includes the max annual average for each MET year.
Dispersion Coefficient	Rural	☐	Urban	☒	Per current South Coast AQMD guidance, urban is the default, and the default urban area population for projects in Orange County is 3,010,232 persons. The project includes a single urban source group that includes all emission sources.
Terrain Height Options	Elevated		☒		--
	Non-Default Regulatory Options				
	Flat	☐	Flat & Elevated	☒	
Receptor Elevations / Hill Heights	Run AERMOD using the AERMAP Receptor Output file (*.ROU)				--

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Table E.3 Dispersion Model Options/Assumptions

Parameter	Value				Comments
Source Pathway					
Building Downwash	Include	☒	Exclude	☐	--
Background Concentrations	Include	☐	Exclude	☒	This project does not consider background concentrations.
Source Groups	CO1	Includes: FLCO18, ICECO1, TOCO18			--
	CO8	Includes: FLCO18, ICECO8, TOCO18			
	NO21	Includes: FLNO21, ICENO21, TONO21AN			
	NO2ANN	Includes: FLNO2AN, ICENO2AN, TONO21AN			
	PM24	Includes: FLPM24, ICEPM24, TOPM24AN			
	PMANN	Includes: FLPMAN, ICEPMAN, TOPM24AN			
	SO21	Includes: FLSO2124, ICESO21, TOSO21H24H			
	SO224	Includes: FLSO2124, ICESO224, TOSO21H24H			
	SO2ANN	Includes: FLSO2AN, ICESO2AN, TOSO2AN			
Urban Groups	\				Run includes a single urban source group that includes all emission sources.
Variable Emissions	N/A				Run assumes continuous operation.

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Appendix E Air Quality Impact Analysis

Table E.3 Dispersion Model Options/Assumptions

Parameter	Value				Comments
Receptor Pathway					
Flagpole Receptors	Include	☐	Exclude	☒	Per current South Coast AQMD guidance, all receptors should be set to ground-level.
Multi-Tier Receptor Grid	Grid Origin: Centroid of Sources Polygon				--
	Tier		Distance from Center (m)	Tier Spacing (m)	
	1 2		1000 5000	50 250	
Plant Boundary	Receptor Spacing: 100 m				The facility encompasses an area on the order of 600 acres. Primary boundary receptors are located at the vertices. Current South Coast AQMD guidance allows 100 meter receptor spacing for facilities with total area greater than or equal to 100 acres. Onsite gridded receptors are disabled.

Facility: Bowerman Power LFG, LLC

Appendix E Air Quality Impact Analysis

Table E.3 Dispersion Model Options/Assumptions

Parameter	Value				Comments
Meteorology Pathway					
Meteorological Data	Station: Mission Viejo Years: 2011, 2012, 2013, 2014, 2016 Base Elevation of Surface Station: 170 m				Meteorological data downloaded from the South Coast AQMD website.
Terrain Pathway					
Data File	USGS_NED_13_n34w118.tif				NED GEOTIFF Digital Terrain Files. Resolution: 1/3-arcsecond (10 meters).
AERMAP Domain Options	Not Specified	☐	User-Defined Domain	☒	Elevations and hill heights are calculated from a region measuring 10,000 meters by 10,000 meters centered on the facility. Source and building base elevations were set to 800 ft to match existing flare station elevation. This was done since the hill is going to be filled and leveled off with the existing flare station.

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Appendix E Air Quality Impact Analysis

Table E.4 AQIA Results

Standard	Background Data Source	2020	2021	2022	Background Concentration (Conc. Units)	Modeled Concentration (ug/m3)	Modeled Concentration (Conc. Units)	Bkg. + Modeled Concentration (Conc. Units)	Ambient Air Quality Standard (Conc. Units)	CEQA Significant Change Threshold (Conc. Units)	Result
NO2; Concentration Units = ppb											
California 1-Hr	SCAQMD; 17	70.9	67.1	53	70.9	1.55	0.82	71.7	180	--	Bkg. + Modeled Concentration < AAQS
California Annual	SCAQMD; 17	13.3	12.4	11.8	13.3	0.05	0.03	13.3	30	--	Bkg. + Modeled Concentration < AAQS
Federal Annual	SCAQMD; 17	13.3	12.4	11.8	13.3	0.05	0.03	13.3	53	--	Bkg. + Modeled Concentration < AAQS
SO2; Concentration Units = ppb											
California 1-Hr	EPA; Site ID 060371103	3.8	2.2	6.5	6.5	6.13E+00	2.3408	8.8	250	--	Bkg. + Modeled Concentration < AAQS
Federal 1-Hr	EPA; Site ID 060371103	3	2	2	2.3	5.59E+00	2.1352	4.4	75	--	Bkg. + Modeled Concentration < AAQS
California 24-Hr	EPA; Site ID 060371103	0.9	1.2	1.2	1.2	1.60E+00	0.6118	1.8	40	--	Bkg. + Modeled Concentration < AAQS
CO; Concentration Units = ppm											
California 1-Hr	SCAQMD; 17	2.3	2.1	2.4	2.4	3.29E+00	0.0029	2.4	20	--	Bkg. + Modeled Concentration < AAQS
Federal 1-Hr	SCAQMD; 17	2.3	2.1	2.4	2.4	3.29E+00	0.0029	2.4	35	--	Bkg. + Modeled Concentration < AAQS
California 8-Hr	SCAQMD; 17	1.7	1.5	1.4	1.7	1.48E+00	0.0013	1.7	9	--	Bkg. + Modeled Concentration < AAQS
Federal 8-Hr	SCAQMD; 17	1.7	1.5	1.4	1.7	1.48E+00	0.0013	1.7	9	--	Bkg. + Modeled Concentration < AAQS
PM10; Concentration Units = ug/m3											

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24-Hr	SCAQMD; 17	120	115	90	120	6.76E-02	0.068	--	--	2.5	Modeled Concentration < CEQA Significant Change Threshold
Annual	SCAQMD; 17	23.9	22.9	22.3	23.9	1.02E-02	0.010	--	--	1	Modeled Concentration < CEQA Significant Change Threshold
PM2.5; Concentration Units = ug/m3											
24-Hr	SCAQMD; 17	27.10	36.70	22.10	28.63	6.76E-02	0.068	--	--	2.5	Modeled Concentration < CEQA Significant Change Threshold

C (ppb) = C (ug/m3) x 24.45 / MW
C (ppm) = C (ug/m3) x 0.02445 / MW

MW NO2	46
MW SO2	64
MW CO	28

'SCAQMD' data from the District's historical Air Quality Data Tables.
http://www.aqmd.gov/home/air-quality/historical-air-quality-data/historical-data-by-year
'EPA' data from EPA's Monitor Values Report.
https://www.epa.gov/outdoor-air-quality-data/monitor-values-report

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Appendix E Air Quality Impact Analysis

Table E.5 AQIA Results

Pollutant	Averaging Time	Federal or State Standard	Modeled Concentration (Concentration Units)	Background Concentration (Concentration Units)	Modeled + Background Concentration (Concentration Units)	CEQA Threshold (Concentration Units)	Significance
NO_2 (Concentration Units = ppb)	1-Hour	California[1]	0.825	70.9	71.7	180	LTS
	Annual	Federal	0.027	13.3	13.3	53	LTS
		California	0.027	13.3	13.3	30	LTS
CO (Concentration Units = ppm)	1-Hour	Federal	0.003	2.4	2.4	35	LTS
		California	0.003	2.4	2.4	20	LTS
	8-Hour	Federal	0.001	1.7	1.7	9	LTS
		California	0.001	1.7	1.7	9	LTS
SO_2 (Concentration Units = ppb)	1-Hour	Federal	2.135	2.3	4.4	75	LTS
		California	2.341	6.5	8.8	250	LTS
	24-Hour	California	0.612	1.2	1.8	40	LTS
PM_{10} (Concentration Units = µg/m3)	24-Hour	SCAQMD CEQA Significant Change Threshold	0.068	–	–	2.5	LTS, modeled concentration is less than significant change threshold.
	Annual		0.010	–	–	1	
$PM_{2.5}$ (Concentration Units = µg/m3)	24-Hour		0.068	–	–	2.5	

1. The modeled concentration presented is the model predicted maximum hourly value using full NO_2 conversion.

Elevated AERMOD Run

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Concentration - Source Group: CO1

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	3.19917	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	4/11/2012, 5
8-HR	1ST	1.50984	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 16
24-HR	1ST	0.98609	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 24
1-HR	4TH	2.79405	ug/m^3	433951.84	3731078.73	308.33	0.00	541.06	4/11/2012, 3
1-HR	8TH	2.59975	ug/m^3	434001.47	3731173.25	305.20	0.00	541.06	4/28/2016, 4
ANNUAL		0.18394	ug/m^3	434112.52	3731309.62	270.41	0.00	541.06	
ANNUAL Y1		0.22546	ug/m^3	434106.28	3731281.54	279.00	0.00	541.06	
ANNUAL Y2		0.19619	ug/m^3	434106.28	3731281.54	279.00	0.00	541.06	
ANNUAL Y3		0.18405	ug/m^3	434149.96	3731412.58	247.13	0.00	541.06	
ANNUAL Y4		0.17150	ug/m^3	434112.52	3731309.62	270.41	0.00	541.06	
ANNUAL Y5		0.17907	ug/m^3	433866.04	3730826.01	279.49	0.00	541.06	

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Concentration - Source Group: CO8

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	2.82719	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	4/11/2012, 5
8-HR	1ST	1.35803	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 16
24-HR	1ST	0.84976	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 24
1-HR	4TH	2.57706	ug/m^3	433866.04	3730826.01	279.49	0.00	541.06	12/5/2011, 17
1-HR	8TH	2.36042	ug/m^3	433841.07	3730779.21	273.50	0.00	541.06	2/2/2011, 2
ANNUAL		0.12960	ug/m^3	434106.28	3731281.54	279.00	0.00	541.06	
ANNUAL Y1		0.16249	ug/m^3	434106.28	3731281.54	279.00	0.00	541.06	
ANNUAL Y2		0.14060	ug/m^3	434106.28	3731281.54	279.00	0.00	541.06	
ANNUAL Y3		0.12445	ug/m^3	434106.28	3731281.54	279.00	0.00	541.06	
ANNUAL Y4		0.11753	ug/m^3	434106.28	3731281.54	279.00	0.00	541.06	
ANNUAL Y5		0.11815	ug/m^3	433866.04	3730826.01	279.49	0.00	541.06	

Elevated AERMOD Run

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Concentration - Source Group: NO21

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	1.52785	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	4/11/2012, 5
8-HR	1ST	0.71340	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 16
24-HR	1ST	0.47848	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 24
1-HR	4TH	1.38355	ug/m^3	434001.47	3731173.25	305.20	0.00	541.06	2/18/2011, 19
1-HR	8TH	1.30127	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	4/28/2016, 3
ANNUAL		0.09995	ug/m^3	434112.52	3731309.62	270.41	0.00	541.06	
ANNUAL Y1		0.12023	ug/m^3	434106.28	3731281.54	279.00	0.00	541.06	
ANNUAL Y2		0.10495	ug/m^3	434112.52	3731309.62	270.41	0.00	541.06	
ANNUAL Y3		0.10185	ug/m^3	434149.96	3731412.58	247.13	0.00	541.06	
ANNUAL Y4		0.09408	ug/m^3	433851.47	3730973.25	271.94	0.00	541.06	
ANNUAL Y5		0.09920	ug/m^3	433866.04	3730826.01	279.49	0.00	541.06	

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Concentration - Source Group: NO2ANN

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	1.15553	ug/m^3	433847.32	3730875.93	277.70	0.00	541.06	12/22/2011, 23
8-HR	1ST	0.52274	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 16
24-HR	1ST	0.32756	ug/m^3	433852.03	3730327.98	266.22	0.00	538.37	12/2/2016, 24
1-HR	4TH	1.03793	ug/m^3	433837.95	3730922.73	280.60	0.00	541.06	11/30/2014, 22
1-HR	8TH	0.97907	ug/m^3	433841.07	3730779.21	273.50	0.00	541.06	2/2/2011, 2
ANNUAL		0.03872	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y1		0.05023	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	
ANNUAL Y2		0.04062	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y3		0.03502	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y4		0.03848	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y5		0.03354	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	

Elevated AERMOD Run

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Concentration - Source Group: PM24

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	0.23838	ug/m^3	433847.32	3730875.93	277.70	0.00	541.06	12/22/2011, 23
8-HR	1ST	0.10958	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 16
24-HR	1ST	0.06762	ug/m^3	433852.03	3730327.98	266.22	0.00	538.37	12/2/2016, 24
1-HR	4TH	0.21369	ug/m^3	433866.04	3730826.01	279.49	0.00	541.06	12/5/2011, 17
1-HR	8TH	0.20173	ug/m^3	433841.07	3730779.21	273.50	0.00	541.06	2/2/2011, 2
ANNUAL		0.00831	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y1		0.01087	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	
ANNUAL Y2		0.00872	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y3		0.00746	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y4		0.00824	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y5		0.00731	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	

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Concentration - Source Group: PMANN

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	0.23540	ug/m^3	433847.32	3730875.93	277.70	0.00	541.06	12/22/2011, 23
8-HR	1ST	0.10637	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 16
24-HR	1ST	0.06667	ug/m^3	433852.03	3730327.98	266.22	0.00	538.37	12/2/2016, 24
1-HR	4TH	0.21142	ug/m^3	433837.95	3730922.73	280.60	0.00	541.06	11/30/2014, 22
1-HR	8TH	0.19925	ug/m^3	433841.07	3730779.21	273.50	0.00	541.06	2/2/2011, 2
ANNUAL		0.00788	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y1		0.01022	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	
ANNUAL Y2		0.00826	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y3		0.00713	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y4		0.00783	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y5		0.00682	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	

Elevated AERMOD Run

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Concentration - Source Group: SO21

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	5.65921	ug/m^3	433847.32	3730875.93	277.70	0.00	541.06	12/22/2011, 23
8-HR	1ST	2.55532	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 16
24-HR	1ST	1.60168	ug/m^3	433852.03	3730327.98	266.22	0.00	538.37	12/2/2016, 24
1-HR	4TH	5.08232	ug/m^3	433837.95	3730922.73	280.60	0.00	541.06	11/30/2014, 22
1-HR	8TH	4.78581	ug/m^3	433841.07	3730779.21	273.50	0.00	541.06	2/2/2011, 2
ANNUAL		0.18924	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y1		0.24535	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	
ANNUAL Y2		0.19849	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y3		0.17124	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y4		0.18812	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y5		0.16378	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	

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Concentration - Source Group: SO224

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	5.65833	ug/m^3	433847.32	3730875.93	277.70	0.00	541.06	12/22/2011, 23
8-HR	1ST	2.55438	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 16
24-HR	1ST	1.60141	ug/m^3	433852.03	3730327.98	266.22	0.00	538.37	12/2/2016, 24
1-HR	4TH	5.08176	ug/m^3	433837.95	3730922.73	280.60	0.00	541.06	11/30/2014, 22
1-HR	8TH	4.78508	ug/m^3	433841.07	3730779.21	273.50	0.00	541.06	2/2/2011, 2
ANNUAL		0.18912	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y1		0.24516	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	
ANNUAL Y2		0.19835	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y3		0.17114	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y4		0.18800	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y5		0.16363	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	

Elevated AERMOD Run

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Concentration - Source Group: SO2ANN

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	3.99772	ug/m^3	433847.32	3730875.93	277.70	0.00	541.06	12/22/2011, 23
8-HR	1ST	1.80464	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	3/20/2011, 16
24-HR	1ST	1.13142	ug/m^3	433852.03	3730327.98	266.22	0.00	538.37	12/2/2016, 24
1-HR	4TH	3.59040	ug/m^3	433837.95	3730922.73	280.60	0.00	541.06	11/30/2014, 22
1-HR	8TH	3.38076	ug/m^3	433841.07	3730779.21	273.50	0.00	541.06	2/2/2011, 2
ANNUAL		0.13360	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y1		0.17319	ug/m^3	434012.68	3731180.13	304.48	0.00	541.06	
ANNUAL Y2		0.14013	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y3		0.12090	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y4		0.13281	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	
ANNUAL Y5		0.11559	ug/m^3	433928.44	3731025.69	311.07	0.00	541.06	

Flat AERMOD Run

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Concentration - Source Group: CO1

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	3.29032	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	12/1/2011, 6
8-HR	1ST	1.70925	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	3/20/2011, 16
24-HR	1ST	1.14463	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	3/20/2011, 24
1-HR	4TH	2.98252	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	12/23/2011, 1
1-HR	8TH	2.51218	ug/m^3	433975.24	3731131.77	170.00	0.00	170.00	5/13/2014, 5
ANNUAL		0.22653	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y1		0.27101	ug/m^3	434050.12	3731228.49	170.00	0.00	170.00	
ANNUAL Y2		0.23735	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y3		0.22493	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y4		0.21870	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	
ANNUAL Y5		0.20553	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	

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Concentration - Source Group: CO8

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	3.00281	ug/m^3	433975.24	3731131.77	170.00	0.00	170.00	8/23/2011, 6
8-HR	1ST	1.48092	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	3/20/2011, 16
24-HR	1ST	0.84944	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	3/20/2011, 24
1-HR	4TH	2.82941	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	8/23/2011, 6
1-HR	8TH	2.26027	ug/m^3	433866.04	3730826.01	170.00	0.00	170.00	12/5/2011, 17
ANNUAL		0.15151	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y1		0.18432	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y2		0.16153	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y3		0.14772	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y4		0.14192	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	
ANNUAL Y5		0.13424	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	

Flat AERMOD Run

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Concentration - Source Group: NO21

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	1.55180	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	12/1/2011, 6
8-HR	1ST	0.83348	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	4/29/2011, 8
24-HR	1ST	0.60195	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	3/20/2011, 24
1-HR	4TH	1.50215	ug/m^3	433975.24	3731131.77	170.00	0.00	170.00	4/10/2012, 21
1-HR	8TH	1.49870	ug/m^3	433975.24	3731131.77	170.00	0.00	170.00	2/2/2011, 20
ANNUAL		0.12479	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y1		0.14836	ug/m^3	434050.12	3731228.49	170.00	0.00	170.00	
ANNUAL Y2		0.12981	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y3		0.12483	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y4		0.12196	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	
ANNUAL Y5		0.11432	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	

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Concentration - Source Group: NO2ANN

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	1.25069	ug/m^3	433975.24	3731131.77	170.00	0.00	170.00	8/23/2011, 6
8-HR	1ST	0.53984	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	3/20/2011, 16
24-HR	1ST	0.29860	ug/m^3	433852.03	3730327.98	170.00	0.00	170.00	12/2/2016, 24
1-HR	4TH	1.14290	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	12/23/2011, 1
1-HR	8TH	0.93389	ug/m^3	433866.04	3730826.01	170.00	0.00	170.00	12/5/2011, 17
ANNUAL		0.03058	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y1		0.04002	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y2		0.03459	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y3		0.02788	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y4		0.02641	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y5		0.02480	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	

Flat AERMOD Run

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Concentration - Source Group: PM24

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	0.25769	ug/m^3	433975.24	3731131.77	170.00	0.00	170.00	8/23/2011, 6
8-HR	1ST	0.11468	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	3/20/2011, 16
24-HR	1ST	0.06142	ug/m^3	433852.03	3730327.98	170.00	0.00	170.00	12/2/2016, 24
1-HR	4TH	0.23664	ug/m^3	434001.47	3731173.25	170.00	0.00	170.00	12/23/2011, 1
1-HR	8TH	0.19290	ug/m^3	433866.04	3730826.01	170.00	0.00	170.00	12/5/2011, 17
ANNUAL		0.00776	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y1		0.00990	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y2		0.00860	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y3		0.00726	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y4		0.00686	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y5		0.00651	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	

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Concentration - Source Group: PMANN

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	0.25483	ug/m^3	433975.24	3731131.77	170.00	0.00	170.00	8/23/2011, 6
8-HR	1ST	0.10984	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	3/20/2011, 16
24-HR	1ST	0.06078	ug/m^3	433852.03	3730327.98	170.00	0.00	170.00	12/2/2016, 24
1-HR	4TH	0.23264	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	12/23/2011, 1
1-HR	8TH	0.19046	ug/m^3	433866.04	3730826.01	170.00	0.00	170.00	12/5/2011, 17
ANNUAL		0.00618	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y1		0.00809	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y2		0.00699	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y3		0.00562	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y4		0.00533	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y5		0.00500	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	

Flat AERMOD Run

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Concentration - Source Group: SO21

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	6.12714	ug/m^3	433975.24	3731131.77	170.00	0.00	170.00	8/23/2011, 6
8-HR	1ST	2.63909	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	3/20/2011, 16
24-HR	1ST	1.46009	ug/m^3	433852.03	3730327.98	170.00	0.00	170.00	12/2/2016, 24
1-HR	4TH	5.58907	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	12/23/2011, 1
1-HR	8TH	4.58338	ug/m^3	433866.04	3730826.01	170.00	0.00	170.00	12/5/2011, 17
ANNUAL		0.14780	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y1		0.19376	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y2		0.16741	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y3		0.13451	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y4		0.12742	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y5		0.11957	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	

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Concentration - Source Group: SO224

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	6.12631	ug/m^3	433975.24	3731131.77	170.00	0.00	170.00	8/23/2011, 6
8-HR	1ST	2.63767	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	3/20/2011, 16
24-HR	1ST	1.45990	ug/m^3	433852.03	3730327.98	170.00	0.00	170.00	12/2/2016, 24
1-HR	4TH	5.58796	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	12/23/2011, 1
1-HR	8TH	4.58267	ug/m^3	433866.04	3730826.01	170.00	0.00	170.00	12/5/2011, 17
ANNUAL		0.14734	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y1		0.19323	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y2		0.16694	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y3		0.13403	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y4		0.12697	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y5		0.11913	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	

Flat AERMOD Run

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Concentration - Source Group: SO2ANN

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start
1-HR	1ST	4.32837	ug/m^3	433975.24	3731131.77	170.00	0.00	170.00	8/23/2011, 6
8-HR	1ST	1.86342	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	3/20/2011, 16
24-HR	1ST	1.03145	ug/m^3	433852.03	3730327.98	170.00	0.00	170.00	12/2/2016, 24
1-HR	4TH	3.94797	ug/m^3	434012.68	3731180.13	170.00	0.00	170.00	12/23/2011, 1
1-HR	8TH	3.23774	ug/m^3	433866.04	3730826.01	170.00	0.00	170.00	12/5/2011, 17
ANNUAL		0.10403	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y1		0.13645	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y2		0.11788	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y3		0.09463	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y4		0.08964	ug/m^3	434106.28	3731281.54	170.00	0.00	170.00	
ANNUAL Y5		0.08411	ug/m^3	433928.44	3731025.69	170.00	0.00	170.00	

2021 AIR QUALITY
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

2021

Source/Receptor Area No.	Location	AQS Station ID	Carbon Monoxide[a]			Ozone[b]										Nitrogen Dioxide[c]				Sulfur Dioxide[d]		
										Number of Days Standard Exceeded												
			No. Days of Data	Max 1-Hour Conc., ppm	Max 8-Hour Conc., ppm	No. Days of Data	Max 1-Hour Conc., ppm	Max 8-Hour Conc., ppm	Fourth High 8-Hour Conc., ppm	Old Federal 1-Hour 0.12 ppm	Current Federal 8-Hour 0.070 ppm	2008 Federal 8-Hour 0.075 ppm	1997 Federal 8-Hour 0.08 ppm	Current State 1-Hour 0.09 ppm	Current State 8-Hour 0.070 ppm	No. Days of Data	Max 1-Hour Conc., ppb	98th Percentile 1-Hour Conc., ppb	Annual Average (AAM) Conc., ppb	No. Days of Data	Max 1-Hour Conc., ppb	99th Percentile 1-Hour Conc., ppb
LOS ANGELES COUNTY																						
1	Central LA	060371103	364	2.0	1.6	351	0.099	0.085	0.068	0	2	1	1	1	2	356	77.8	57.3	17.7	365	2.2	2.0
2	Northwest Coastal LA County	060370113	174	1.5	1.0	356	0.095	0.082	0.059	0	1	1	0	1	1	360	60.6	41.6	10.0	--	--	--
3	Southwest LA County*	060375005	251	1.7	1.3	245	0.059	0.049	0.047	0	0	0	0	0	0	256	62.8	47.5	7.2	254	7.7	4.3
4	South Coastal LA County 1	060374002	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4	South Coastal LA County 2	060374004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4	South Coastal LA County 4	060374009	--	--	--	356	0.086	0.064	0.060	0	0	0	0	0	0	361	59.0	55.3	12.8	360	5.9	4.2
4	I-710 Near Road	060374008	--	--	--	--	--	--	--	--	--	--	--	--	--	351	91.5	76.0	25.2	--	--	--
6	West San Fernando Valley	060371201	363	2.6	1.9	357	0.110	0.083	0.080	0	31	16	0	4	33	361	54.2	42.6	10.4	--	--	--
7	East San Fernando Valley	060374010	--	--	--	349	0.110	0.089	0.079	0	17	7	1	6	17	359	65.4	49.4	13.9	--	--	--
8	West San Gabriel Valley	060372005	364	1.9	1.6	362	0.104	0.087	0.081	0	25	13	1	12	32	364	77.3	52.0	13.6	--	--	--
9	East San Gabriel Valley 1	060370002	355	1.5	1.4	355	0.108	0.086	0.077	0	21	13	1	20	22	357	78.1	51.0	14.8	--	--	--
9	East San Gabriel Valley 2	060370016	353	1.4	0.9	356	0.125	0.096	0.090	1	54	31	11	39	58	352	68.6	47.6	10.3	--	--	--
10	Pomona/Walnut Valley	060371701	353	1.7	1.3	352	0.120	0.092	0.089	0	41	21	11	27	43	364	71.4	56.0	17.9	--	--	--
11	South San Gabriel Valley	060371602	362	1.8	1.5	357	0.104	0.074	0.068	0	3	0	0	2	3	361	72.2	54.7	17.5	--	--	--
12	South Central LA County	060371302	364	4.3	3.7	345	0.085	0.076	0.062	0	1	1	0	0	1	364	68.2	55.9	14.0	--	--	--
13	Santa Clarita Valley	060376012	365	1.0	0.7	360	0.125	0.103	0.097	1	61	47	21	30	63	365	56.9	35.2	9.9	--	--	--
ORANGE COUNTY																						
16	North Orange County	060595001	365	2.3	1.3	352	0.103	0.075	0.070	0	2	0	0	2	3	346	63.8	50.8	12.7	--	--	--
17	Central Orange County	060590007	363	2.1	1.5	355	0.089	0.068	0.063	0	0	0	0	0	0	356	67.1	53.2	12.4	--	--	--
17	I-5 Near Road	060590008	340	2.3	1.7	--	--	--	--	--	--	--	--	--	--	343	72.3	55.8	18.9	--	--	--
19	Saddleback Valley	060592022	365	1.0	0.8	363	0.105	0.081	0.078	0	8	4	0	2	8	--	--	--	--	--	--	--
RIVERSIDE COUNTY																						
23	Metropolitan Riverside County 1	060658001	365	2.1	1.8	340	0.117	0.097	0.091	0	55	32	12	20	57	341	52.0	50.7	14.3	363	2.1	1.8
23	Metropolitan Riverside County 3	060658005	365	2.0	1.6	357	0.116	0.094	0.093	0	53	33	14	20	59	365	53.3	45.1	11.7	--	--	--
24	Perris Valley	060656001	--	--	--	309	0.117	0.094	0.091	0	55	38	14	25	60	--	--	--	--	--	--	--
25	Lake Elsinore Area	060659001	364	0.9	0.8	354	0.118	0.097	0.090	0	44	22	8	18	46	357	43.7	36.4	7.0	--	--	--
26	Temecula Valley	060650016	--	--	--	364	0.095	0.083	0.078	0	10	6	0	1	11	--	--	--	--	--	--	--
29	Banning/San Gorgonio Pass	060650012	--	--	--	354	0.139	0.116	0.102	4	80	56	24	41	82	365	56.8	47.4	8.7	--	--	--
30	Coachella Valley 1**	060655001	365	0.8	0.4	357	0.110	0.092	0.088	0	35	15	7	10	38	360	35.6	32.9	6.8	--	--	--
30	Coachella Valley 2**	060652002	--	--	--	352	0.099	0.078	0.076	0	18	6	0	2	24	--	--	--	--	--	--	--
30	Coachella Valley 3**	060652005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SAN BERNARDINO COUNTY																						
32	Northwest San Bernardino Valley	060711004	348	1.3	1.1	359	0.124	0.100	0.097	0	78	50	22	42	81	354	64.6	49.4	14.8	--	--	--
33	CA-60 Near Road	060710027	--	--	--	--	--	--	--	--	--	--	--	--	--	350	80.2	72.9	30.0	--	--	--
33	I-10 Near Road	060710026	365	2.8	1.4	--	--	--	--	--	--	--	--	--	--	365	80.8	68.3	28.6	--	--	--
34	Central San Bernardino Valley 1	060712002	362	1.9	1.4	356	0.125	0.103	0.099	1	81	56	26	44	83	364	67.2	60.7	19.0	364	5.0	1.9
34	Central San Bernardino Valley 2	060719004	359	2.0	1.6	355	0.142	0.112	0.105	6	98	74	40	66	101	362	56.3	48.9	15.1	--	--	--
35	East San Bernardino Valley	060714003	--	--	--	361	0.145	0.119	0.112	7	114	93	50	74	118	--	--	--	--	--	--	--
37	Central San Bernardino Mountains	060710005	--	--	--	345	0.148	0.120	0.107	7	110	91	55	65	111	--	--	--	--	--	--	--
38	East San Bernardino Mountains	060718001	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	DISTRICT MAXIMUM[e]			4.3	3.7		0.148	0.120	0.112	7	114	93	55	74	118		91.5	76.0	30.0		7.7	4.3
	SOUTH COAST AIR BASIN[f]			4.3	3.7		0.148	0.120	0.112	12	130	113	68	91	133		91.5	76.0	30.0		7.7	4.3

*Incomplete data due to site closure in September 2021. **Salton Sea Air Basin -- Pollutant not monitored ppm - Parts Per Million in air, by volume ppb - Parts Per Billion in air, by volume AAM - Annual Arithmetic Mean

a) The federal and state 8-hour CO standards (9 ppm and 9.0 ppm, respectively) along with the federal and state 1-hour CO standards (35 ppm and 20 ppm, respectively) were not exceeded.

b) The current (2015) O_3 federal standard became effective December 28, 2015.

c) The NO_2 federal 1-hour standard is 100 ppb and the annual standard is 53.4 ppb. The state 1-hour and annual standards are 180 ppb and 30 ppb, respectively.

d) The federal SO_2 1-hour standard is 75 ppb. The state 1-hour and annual standards are 250 ppb and 40 ppb, respectively.

e) District Maximum is the maximum value calculated at any one station in the South Coast AQMD jurisdiction.

f) Statistics are calculated with a dataset that aggregates the highest concentration at any station in the South Coast Air Basin for each day and pollutant. Therefore, concentrations are the maximum value observed at any station in the South Coast Air Basin. Number of daily exceedances are the total number of days that the indicated concentration is exceeded at any station in the South Coast Air Basin.

South Coast Air Quality Management District
21865 Copley Drive
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For information on the current standard levels and most recent revisions please refer to "Appendix II – Current Air Quality" of the 2022 Air Quality Management Plan, which can be accessed at www.aqmd.gov/2022aqmp. A map showing the source/receptor area boundaries and station locations is available at www.aqmd.gov/aqcard2021map.

2021 AIR QUALITY
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

2021

Source/Receptor Area No.	Location	AQS Station ID	Suspended Particulates PM10[g]					Fine Particulates PM2.5[i]					Lead[k]		PM10 Sulfate[l]	
			No. Days of Data	Max 24-Hour Conc., µg/m³	No. (%) Samples Exceeding Federal 24-Hour 150 µg/m³	No. (%) Samples Exceeding State 24-Hour 50 µg/m³	Annual Average Conc.[h] (AAM), µg/m³	No. Days of Data	Max 24-Hour Conc., µg/m³	98th Percentile 24-Hour Conc., µg/m³	No. (%) Samples Exceeding Federal 24-Hour Standard 35 µg/m³	Annual Average Conc.[j] (AAM), µg/m³	Max Monthly Average Conc., µg/m³	Max 3-Month Rolling Average Conc., µg/m³	No. Days of Data	Max 24-Hour Conc., µg/m³
LOS ANGELES COUNTY																
1	Central LA	060371103	60	64	0 (0%)	3 (5%)	25.5	363	61	44.8	12 (3%)	12.77	0.012	0.012	61	4.4
2	Northwest Coastal LA County	060370113	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3	Southwest LA County*	060375005	31	33	0 (0%)	0 (0%)	17.7	--	--	--	--	--	0.003	0.004	--	--
4	South Coastal LA County 1	060374002	--	--	--	--	--	119	41.2	31.2	1 (1%)	10.93	--	--	--	--
4	South Coastal LA County 2	060374004	60	48	0 (0%)	0 (0%)	22.7	364	42.9	32.8	4 (1%)	11.47	0.006	0.007	--	--
4	South Coastal LA County 4	060374009	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4	I-710 Near Road	060374008	--	--	--	--	--	365	84.6	34.8	7 (2%)	13.01	--	--	--	--
6	West San Fernando Valley	060371201	--	--	--	--	--	120	55.5	36.1	3 (3%)	10.06	--	--	--	--
7	East San Fernando Valley	060374010	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8	West San Gabriel Valley	060372005	--	--	--	--	--	119	63.6	29.9	2 (2%)	10.74	--	--	--	--
9	East San Gabriel Valley 1	060370002	61	79	0 (0%)	11 (18%)	32.8	120	61.9	36.1	3 (3%)	11.43	--	--	61	4.8
9	East San Gabriel Valley 2	060370016	358	121	0 (0%)	9 (3%)	26.8	--	--	--	--	--	--	--	--	--
10	Pomona/Walnut Valley	060371701	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11	South San Gabriel Valley	060371602	--	--	--	--	--	122	66	47.9	3 (2%)	13.07	0.011	0.010	--	--
12	South Central LA County	060371302	--	--	--	--	--	349	102.1	42.5	12 (3%)	13.41	0.007	0.009	--	--
13	Santa Clarita Valley	060376012	60	47	0 (0%)	0 (0%)	19.9	--	--	--	--	--	--	--	--	--
ORANGE COUNTY																
16	North Orange County	060595001	--	--	--	--	--	--	--	--	--	--	--	--	--	--
17	Central Orange County	060590007	361	115	0 (0%)	12 (3%)	22.9	364	54.4	36.7	9 (2%)	11.44	--	--	61	3.8
17	I-5 Near Road	060590008	--	--	--	--	--	--	--	--	--	--	--	--	--	--
19	Saddleback Valley	060592022	60	35	0 (0%)	0 (0%)	15.6	122	28.7	24.5	0 (0%)	8.27	--	--	--	--
RIVERSIDE COUNTY																
23	Metropolitan Riverside County 1	060658001	121	76	0 (0%)	16 (13%)	34.2	364	82.1	36.7	10 (3%)	12.58	0.008	0.010	122	3.4
23	Metropolitan Riverside County 3	060658005	362	132	0 (0%)	170 (47%)	49.6	364	77.6	39.7	13 (4%)	14.28	--	--	--	--
24	Perris Valley	060656001	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25	Lake Elsinore Area	060659001	360	89	0 (0%)	4 (1%)	21.4	--	--	--	--	--	--	--	--	--
26	Temecula Valley	060650016	--	--	--	--	--	--	--	--	--	--	--	--	--	--
29	Banning/San Gorgonio Pass	060650012	61	48	0 (0%)	0 (0%)	20.7	--	--	--	--	--	--	--	--	--
30	Coachella Valley 1**	060655001	361	100	0 (0%)	9 (2%)	21.4	122	13.5	12.6	0 (0%)	6.2	--	--	--	--
30	Coachella Valley 2**	060652002	345	123	0 (0%)	30 (9%)	32.3	120	18	14.2	0 (0%)	8.15	--	--	121	3.3
30	Coachella Valley 3**	060652005	359	147	0 (0%)	69 (19%)	39.1	--	--	--	--	--	--	--	--	--
SAN BERNARDINO COUNTY																
32	Northwest San Bernardino Valley	060711004	358	123	0 (0%)	16 (4%)	31.7	--	--	--	--	--	--	--	--	--
33	CA-60 Near Road	060710027	--	--	--	--	--	362	65.4	43.6	13 (4%)	14.48	--	--	--	--
33	I-10 Near Road	060710026	--	--	--	--	--	--	--	--	--	--	--	--	--	--
34	Central San Bernardino Valley 1	060712002	53	73	0 (0%)	4 (8%)	32.1	120	55.1	33.4	2 (2%)	12.07	--	--	54	3.6
34	Central San Bernardino Valley 2	060719004	364	111	0 (0%)	79 (22%)	39.3	120	57.9	34.2	1 (1%)	11.9	0.013	0.008	--	--
35	East San Bernardino Valley	060714003	59	44	0 (0%)	0 (0%)	23.2	--	--	--	--	--	--	--	--	--
37	Central San Bernardino Mountains	060710005	59	33	0 (0%)	0 (0%)	15.8	--	--	--	--	--	--	--	--	--
38	East San Bernardino Mountains	060718001	--	--	--	--	--	59	24.5	21.5	0 (0%)	7.04	--	--	--	--
	DISTRICT MAXIMUM[m]			147	0	170	49.6		102.1	47.9	13	14.48	0.013	0.012		4.8
	SOUTH COAST AIR BASIN[n]			132	0	179	49.6		102.1	47.9	20	14.48	0.013	0.012		4.8

*Incomplete data due to site closure in September 2021. ** Salton Sea Air Basin µg/m³ – Micrograms per cubic meter of air AAM – Annual Arithmetic Mean -- Pollutant not monitored

g) PM10 statistics listed above are based on combined Federal Reference Method (FRM) and Federal Equivalent Method (FEM) data. High PM10 (≥ 155 µg/m³) data recorded in the Coachella Valley and the Basin (due to high winds) are excluded because they likely meet the exclusion criteria specified in the U.S. EPA Exceptional Event Rule. Exceptional event demonstrations will be submitted to U.S. EPA for events that have regulatory significance.

h) State annual average PM10 standard is 20 µg/m³. Federal annual PM10 standard (50 µg/m³) was revoked in 2006.

i) PM2.5 statistics listed above represent FRM data only with the exception of Central Orange County, Metropolitan Riverside County 1, Metropolitan Riverside County 2, South Coastal LA County 2, I-710 Near Road, and CA-60 Near Road, where FEM PM2.5 measurements are used to supplement missing FRM measurements as outlined in the U.S. EPA Response Letter (dated October 31, 2022) to the South Coast AQMD PM2.5 Continuous Monitor Comparability Assessment and Request for Waiver (available with a Public Records Request). PM2.5 concentrations above the 24-hour standard attributed to fireworks are excluded because they likely meet the exclusion criteria specified in the U.S. EPA Exceptional Event Rule. Exceptional event demonstrations will be submitted to U.S. EPA for events that have regulatory significance.

j) Both Federal and State standards are 12.0 µg/m³.

k) Lead is measured in Total Suspended Particulate (TSP) samples. Federal lead standard is 3-months rolling average (0.15 µg/m³); state standard is monthly average (1.5 µg/m³). Note 3-month averages include data from November and December 2020. Higher lead concentrations were recorded at near-source monitoring sites immediately downwind of stationary lead sources. Maximum monthly and 3-month rolling averages recorded at near-source sites were 0.083 µg/m³ and 0.057 µg/m³, respectively. Lead standards were not exceeded at any site.

l) State 24-hour sulfate standard is 25 µg/m³. There is no federal standard for sulfate.

m) District Maximum is the maximum value calculated at any one station in the South Coast AQMD jurisdiction.

n) Statistics are calculated with a dataset that aggregates the highest concentration at any station in the South Coast Air Basin for each day and pollutant. Therefore, concentrations are the maximum value observed at any station in the South Coast Air Basin. Number of daily exceedances are the total number of days that the indicated concentration is exceeded at any station in the South Coast Air Basin.

2022 AIR QUALITY
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

2022

Source/Receptor Area No.	Location	AQS Station ID	Carbon Monoxide[a]			Ozone[b]										Nitrogen Dioxide[c]				Sulfur Dioxide[d]		
										Number of Days Standard Exceeded												
			No. Days of Data	Max 1-Hour Conc., ppm	Max 8-Hour Conc., ppm	No. Days of Data	Max 1-Hour Conc., ppm	Max 8-Hour Conc., ppm	Fourth High 8-Hour Conc., ppm	Old Federal 1-Hour > 0.12 ppm	Current Federal 8-Hour > 0.070 ppm	2008 Federal 8-Hour > 0.075 ppm	1997 Federal 8-Hour > 0.08 ppm	Current State 1-Hour > 0.09 ppm	Current State 8-Hour > 0.070 ppm	No. Days of Data	Max 1-Hour Conc., ppb	98th Percentile 1-Hour Conc., ppb	Annual Average (AAM) Conc., ppb	No. Days of Data	Max 1-Hour Conc., ppb	99th Percentile 1-Hour Conc., ppb
LOS ANGELES COUNTY																						
1	Central LA	060371103	365	1.7	1.5	362	0.138	0.090	0.073	1	6	2	1	1	6	364	75.1	56.9	18.5	361	6.5	2.3
2	Northwest Coastal LA County	060370113				335	0.081	0.070	0.058	0	0	0	0	0	0	364	51.4	44.5	11.4			
4	South Coastal LA County 1*	060374002																				
4	South Coastal LA County 2*	060374004																				
4	South Coastal LA County 3	060374006																				
4	South Coastal LA County 4	060374009				359	0.108	0.077	0.058	0	1	1	0	1	1	363	58.1	47.5	12.8	357	6.1	4.4
4	I-710 Near Road[##]	060374008														365	95.0	76.0	25.1			
6	West San Fernando Valley	060371201	364	2.2	1.8	358	0.110	0.096	0.078	0	23	11	2	7	24	364	54.7	42.1	10.2			
7	East San Fernando Valley	060374010				360	0.106	0.091	0.082	0	13	9	1	6	15	363	54.2	47.2	12.9			
8	West San Gabriel Valley	060372005	364	1.6	1.3	361	0.143	0.102	0.081	1	22	11	2	12	23	364	65.9	50.2	13.3			
9	East San Gabriel Valley 1*	060370002	260	1.3	0.9	257	0.111	0.080	0.075	0	11	3	0	6	11	260	47.9	44.3	13.0			
9	East San Gabriel Valley 2	060370016	361	0.9	0.6	359	0.143	0.101	0.094	1	60	40	17	46	61	365	54.2	35.9	7.9			
10	Pomona/Walnut Valley	060371701	363	1.6	1.1	348	0.131	0.096	0.088	1	46	26	12	28	49	361	58.4	50.1	17.0			
11	South San Gabriel Valley	060371602	356	1.6	1.5	349	0.123	0.091	0.070	0	2	2	1	3	3	362	64.5	53.7	17.0			
12	South Central LA County	060371302	359	3.4	3.0	358	0.111	0.085	0.064	0	1	1	1	1	1	365	64.9	55.0	14.4			
13	Santa Clarita Valley	060376012	364	1.5	0.6	355	0.129	0.114	0.095	1	66	43	18	28	68	364	51.5	33.3	9.1			
ORANGE COUNTY																						
16	North Orange County	060595001	364	2.5	1.4	357	0.106	0.087	0.070	0	3	1	1	1	4	364	57.7	45.1	12.2			
17	Central Orange County	060590007	357	2.4	1.4	358	0.102	0.076	0.060	0	1	1	0	1	1	364	53.0	47.8	11.8			
17	I-5 Near Road[##]	060590008	363	2.6	1.9											358	62.0	52.0	18.9			
19	Saddleback Valley*	060592022	211	1.2	1.0	206	0.110	0.088	0.074	0	5	2	1	1	6							
RIVERSIDE COUNTY																						
23	Metropolitan Riverside County 1	060658001	365	3.3	1.2	351	0.122	0.095	0.092	0	70	43	14	30	72	358	55.9	47.7	13.2	357	6.7	2.9
23	Metropolitan Riverside County 3	060658005	364	1.6	1.2	361	0.120	0.094	0.087	0	57	33	9	19	58	365	47.4	42.2	10.8			
25	Lake Elsinore Area	060659001	362	0.9	0.6	345	0.121	0.091	0.086	0	37	27	5	17	37	364	37.2	32.2	7.1			
26	Temecula Valley	060650016				361	0.087	0.079	0.070	0	3	2	0	0	4							
29	Banning/San Gorgonio Pass	060650012				362	0.116	0.100	0.093	0	56	39	14	30	59	360	51.5	45.6	8.3			
30	Coachella Valley 1[‡]	060655001	354	1.1	0.5	358	0.106	0.089	0.084	0	39	24	3	7	43	365	37.5	32.5	6.3			
30	Coachella Valley 2[‡]*	060652002				109	0.072	0.069	0.066	0	0	0	0	0	0							
30	Coachella Valley 3[‡]	060652005																				
SAN BERNARDINO COUNTY																						
32	Northwest San Bernardino Valley	060711004	353	1.1	0.8	364	0.155	0.100	0.098	1	67	50	25	45	69	363	53.3	45.3	15.3			
33	CA-60 Near Road[##]	060710027														365	84.6	67.4	28.7			
33	I-10 Near Road[##]	060710026	365	1.3	1.0											363	80.2	61.2	25.5			
34	Central San Bernardino Valley 1	060712002	355	1.6	1.0	347	0.144	0.107	0.095	1	68	49	17	44	70	359	68.7	50.5	17.7	350	2.7	2.1
34	Central San Bernardino Valley 2	060719004	352	1.7	1.4	355	0.128	0.105	0.103	3	96	70	35	60	103	362	52.6	44.9	15.7			
35	East San Bernardino Valley	060714003				362	0.135	0.109	0.103	2	104	77	32	63	106							
37	Central San Bernardino Mountains	060710005				364	0.143	0.122	0.105	4	100	83	52	61	102							
38	East San Bernardino Mountains	060718001																				
	DISTRICT MAXIMUM[e]			3.4	3.0		0.155	0.122	0.105	4	104	83	52	63	106		95.0	76.0	28.7		6.7	4.4
	SOUTH COAST AIR BASIN[f]			3.4	3.0		0.155	0.122	0.105	7	123	105	65	88	126		95.0	76.0	28.7		6.7	4.4

*Incomplete data due to site closure or modification in 2022. [‡] Salton Sea Air Basin -- Pollutant not monitored ppm - Parts Per Million in air, by volume ppb - Parts Per Billion in air, by volume AAM - Annual Arithmetic Mean

a) The federal and state 8-hour CO standards (9 ppm and 9.0 ppm, respectively) along with the federal and state 1-hour CO standards (35 ppm and 20 ppm, respectively) were not exceeded.

b) The current (2015) O_3 federal standard became effective December 28, 2015.

c) The NO_2 federal 1-hour standard is 100 ppb and the annual standard is 0.0534 ppm (53.4 ppb). The state 1-hour and annual standards are 0.18 ppm and 0.030 ppm, respectively.

d) The federal SO_2 1-hour standard is 75 ppb (0.075 ppm). The state standards are 1-hour average SO_2 > 0.25 ppm (250 ppb) and 24-hour average SO_2 > 0.04 ppm (40 ppb).

e) District Maximum is the maximum value calculated at any one station in the South Coast AQMD jurisdiction.

f) Exceedance statistics are calculated with a dataset that aggregates the highest concentration at any station in the South Coast Air Basin for each day and pollutant. Number of daily exceedances are the total number of days that the indicated concentration is exceeded at any station in the South Coast Air Basin. Statistics in concentration units are simply the maxium value at any station in the South Coast Air Basin.

[##] Four near-road sites measuring one or more of the pollutants $PM_{2.5}$, CO and/or NO_2 are operating near the following freeways: I-5, I-10, CA-60 and I-710.

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2022 AIR QUALITY
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

2022

Source/Receptor Area No.	Location	AQS Station ID	Suspended Particulates PM10[g]					Fine Particulates PM2.5[i]					Lead[k]		PM10 Sulfate[l]	
			No. Days of Data	Max 24-Hour Conc., µg/m³	No. (%) Samples Exceeding Federal 24-Hour > 150 µg/m³	No. (%) Samples Exceeding State 24-Hour > 50 µg/m³	Annual Average Conc.[h] (AAM), µg/m³	No. Days of Data	Max 24-Hour Conc., µg/m³	98th Percentile 24-Hour Conc., µg/m³	No. (%) Samples Exceeding Federal 24-Hour Standard > 35 µg/m³	Annual Average Conc.[j] (AAM), µg/m³	Max Monthly Average Conc., µg/m³	Max 3-Month Rolling Average Conc., µg/m³	No. Days of Data	Max 24-Hour Conc., µg/m³
LOS ANGELES COUNTY																
1	Central LA	060371103	360	60	0 (0%)	4 (1%)	28.9	361	33.7	21.9	0 (0%)	10.94	0.008	0.007	61	5.8
2	Northwest Coastal LA County	060370113						55	20.0	18	0 (0%)	9.92				
4	South Coastal LA County 1*	060374002						120	26.1	20	0 (0%)	10.66	0.007	0.006		
4	South Coastal LA County 2*	060374004	20	48	0 (0%)	0 (0%)	25.5									
4	South Coastal LA County 3	060374006	355	128.0	0 (0%)	33 (9%)	34.4									
4	South Coastal LA County 4	060374009	363	57	0 (0%)	2 (1%)	24.7	22	28.8	28.8	0 (0%)	10.80				
4	I-710 Near Road[##]	060374008						364	39.0	25.5	1 (0%)	11.91				
6	West San Fernando Valley	060371201						121	20.5	19.5	0 (0%)	8.81				
7	East San Fernando Valley	060374010														
8	West San Gabriel Valley	060372005						120	22.1	19	0 (0%)	9.11				
9	East San Gabriel Valley 1*	060370002	43	98	0 (0%)	7 (16%)	37.9	76	18.4	17.8	0 (0%)	9.98			44	8.4
9	East San Gabriel Valley 2	060370016	358	83	0 (0%)	6 (2%)	24.6									
10	Pomona/Walnut Valley	060371701														
11	South San Gabriel Valley	060371602						115	53.8	25.6	1 (1%)	11.32	0.007	0.007		
12	South Central LA County	060371302						365	52.8	32.6	6 (2%)	12.25	0.010	0.008		
13	Santa Clarita Valley	060376012	61	36	0 (0%)	0 (0%)	18.5									
ORANGE COUNTY																
16	North Orange County	060595001														
17	Central Orange County	060590007	360	90	0 (0%)	7 (2%)	22.3	365	33.1	22.1	0 (0%)	9.87			56	9.6
17	I-5 Near Road[##]	060590008														
19	Saddleback Valley*	060592022	34	31	0 (0%)	0 (0%)	15.3									
RIVERSIDE COUNTY																
23	Metropolitan Riverside County 1	060658001	357	153	0 (0%)	55 (15%)	37.0	365	38.5	23.2	1 (0%)	10.80	0.007	0.006	119	4.3
23	Metropolitan Riverside County 3	060658005	360	149	0 (0%)	141 (39%)	45.4	365	32.1	26.2	0 (0%)	11.49				
25	Lake Elsinore Area	060659001	365	91	0 (0%)	1 (0%)	19.8									
26	Temecula Valley	060650016														
29	Banning/San Gorgonio Pass	060650012	51	52	0 (0%)	2 (4%)	25.0									
30	Coachella Valley 1[‡]	060655001	362	432	4 (1%)	16 (4%)	25.3	120	31.2	16.1	0 (0%)	6.32				
30	Coachella Valley 2*[‡]	060652002	110	160	1 (1%)	11 (10%)	36.6	13	21.3	21.3	0 (0%)	13.92			36	2.7
30	Coachella Valley 3[‡]	060652005	338	428	10 (3%)	58 (17%)	41.8									
SAN BERNARDINO COUNTY																
32	Northwest San Bernardino Valley	060711004	360	144	0 (0%)	8 (2%)	29.3									
33	CA-60 Near Road[##]	060710027						361	41.8	26.4	1 (0%)	12.20				
33	I-10 Near Road[##]	060710026														
34	Central San Bernardino Valley 1	060712002	60	62	0 (0%)	8 (13%)	31.5	120	38.1	28.1	1 (1%)	10.89			61	4.7
34	Central San Bernardino Valley 2	060719004	360	177	1 (0%)	65 (18%)	38.0	118	40.1	25.8	2 (2%)	11.26	0.009	0.008		
35	East San Bernardino Valley	060714003	61	50	0 (0%)	0 (0%)	22.0									
37	Central San Bernardino Mountains	060710005	52	49	0 (0%)	0 (0%)	15.6									
38	East San Bernardino Mountains	060718001						30	22.1	22.1	0 (0%)	6.85				
	DISTRICT MAXIMUM[m]			432	10	141	45.4		53.8	32.6	6	13.92	0.010	0.008		9.6
	SOUTH COAST AIR BASIN[n]			177	1	168	45.4		53.8	32.6	9	12.25	0.010	0.008		9.6

*Incomplete data due to site closure or modification in 2022. [‡] Salton Sea Air Basin µg/m³ – Micrograms per cubic meter of air AAM – Annual Arithmetic Mean -- Pollutant not monitored

g) PM10 statistics listed above are based on combined Federal Reference Method (FRM) and Federal Equivalent Method (FEM) data. High PM10 (≥ 155 µg/m³) data recorded in the Coachella Valley and the Basin (due to high winds) are excluded because they likely meet the exclusion criteria specified in the U.S. EPA Exceptional Event Rule. Exceptional event demonstrations will be submitted to U.S. EPA for events that have regulatory significance.

h) State annual average (AAM) PM10 standard is > 20 µg/m³. Federal annual PM10 standard (AAM > 50 µg/m³) was revoked in 2006.

i) PM2.5 statistics listed above represent FRM data only with the exception of Central Orange County, Metropolitan Riverside County, South Coastal LA County 2, South Central LA County, I-710 Near Road, CA-60 Near Road, and East San Bernardino Mountains, where FEM or SPM PM2.5 measurements are used to supplement missing FRM measurements. PM2.5 concentrations above the 24-hour standard attributed to fireworks are excluded because they likely meet the exclusion criteria specified in the U.S. EPA Exceptional Event Rule. Exceptional event demonstrations will be submitted to U.S. EPA for events that have regulatory significance.

j) Both Federal and State standards are annual average (AAM) > 12.0 µg/m³.

k) Lead is measured in Total Suspended Particulate (TSP) samples. Federal lead standard is 3-months rolling average > 0.15 µg/m³; state standard is monthly average > 1.5 µg/m³. Note 3-month averages include data from November and December 2021. Higher lead concentrations were recorded at near-source monitoring sites immediately downwind of stationary lead sources. Maximum monthly and 3-month rolling averages recorded at near-source sites were 0.055 µg/m³ and 0.037 µg/m³, respectively. Lead standards were not exceeded at any site.

l) State 24-hour sulfate standard is > 25 µg/m³. There is no federal standard for sulfate.

m) District Maximum is the maximum value calculated at any one station in the South Coast AQMD jurisdiction.

n) Exceedance statistics are calculated with a dataset that aggregates the highest concentration at any station in the South Coast Air Basin for each day and pollutant. Therefore, concentrations used to calculate exceedances are the maximum value observed at any station in the South Coast Air Basin. Number of daily exceedances are the total number of days that the indicated concentration is exceeded at any station in the South Coast Air Basin. Statistics in concentration units are simply the maxium value at any station in the South Coast Air Basin.

Four near-road sites measuring one or more of the pollutants PM2.5, CO and/or NO2 are operating near the following freeways: I-5, I-10, CA-60 and I-710.

2020 AIR QUALITY
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

2020

Source/Receptor Area No.	Location	Station No.	Carbon Monoxide [a]			Ozone [b]				Number of Days Standard Exceeded						Nitrogen Dioxide [c]				Sulfur Dioxide [d]		
			No. Days of Data	Max Conc. in ppm 1-hour	Max Conc. in ppm 8-hour	No. Days of Data	Max. Conc. in ppm 1-hour	Max. Conc. in ppm 8-hour	Fourth High Conc. ppm 8-hour	Old Federal > 0.124 ppm 1-hour	Current Federal > 0.070 ppm 8-hour	2008 Federal > 0.075 ppm 8-hour	1997 Federal > 0.084 ppm 8-hour	Current State > 0.09 ppm 1-hour	Current State > 0.070 ppm 8-hour	No. Days of Data	Max Conc. in ppb 1-hour	98th Percentile Conc. ppb 1-hour	Annual Average AAM Conc. ppb	No. Days of Data	Max. Conc. in ppb 1-hour	99th Percentile Conc. ppb 1-hour
LOS ANGELES COUNTY																						
1	Central LA	087	359	1.9	1.5	332	0.185	0.118	0.093	1	22	16	6	14	22	364	61.8	54.7	16.9	333	3.8	3.3
2	Northwest Coastal LA County	091	365	2.0	1.2	357	0.134	0.092	0.078	1	8	5	1	6	8	360	76.6	43.9	10.6	--	--	--
3	Southwest Coastal LA County	820	364	1.6	1.3	350	0.117	0.074	0.066	0	2	0	0	1	2	364	59.7	50.9	9.5	361	6.0	3.3
4	South Coastal LA County 1	072	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4	South Coastal LA County 2	077	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--
4	South Coastal LA County 3	033	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.4
4	South Coastal LA County 4	039	--	--	--	332	0.105	0.083	0.071	0	4	2	0	4	4	357	75.3	56.3	12.8	--	--	--
4	I-710 Near Road##	032	--	--	--	--	--	--	--	--	--	--	--	--	--	355	90.3	79.1	22.3	--	--	--
6	West San Fernando Valley	074	349	2.0	1.7	345	0.142	0.115	0.097	0	49	23	12	14	49	365	57.2	50.1	12.1	--	--	--
7	East San Fernando Valley	200	--	--	--	359	0.133	0.108	0.102	5	49	33	20	31	49	357	60.4	52.4	14.5	--	--	--
8	West San Gabriel Valley	088	361	2.6	2.2	354	0.163	0.115	0.108	9	60	44	21	41	60	354	61.2	49.7	13.6	--	--	--
9	East San Gabriel Valley 1	060	349	2.4	2.0	347	0.168	0.125	0.105	11	61	43	19	53	61	347	64.8	54.1	13.6	--	--	--
9	East San Gabriel Valley 2	591	310	2.3	1.9	348	0.173	0.138	0.124	17	97	71	32	76	97	366	50.4	41.9	8.5	--	--	--
10	Pomona/Walnut Valley	075	363	1.5	1.1	353	0.180	0.124	0.106	10	84	53	29	51	84	355	67.9	59.8	18.3	--	--	--
11	South San Gabriel Valley	085	362	3.1	1.7	356	0.169	0.114	0.089	3	23	15	7	20	23	365	69.2	57.8	17.8	--	--	--
12	South Central LA County	112	364	4.5	3.1	354	0.152	0.115	0.072	1	4	3	2	3	4	362	72.3	60.5	14.5	--	--	--
13	Santa Clarita Valley	090	363	1.2	0.8	348	0.148	0.122	0.106	10	73	56	29	44	73	361	46.3	35.9	9.4	--	--	--
ORANGE COUNTY																						
16	North Orange County	3177	347	2.1	1.2	340	0.171	0.113	0.088	3	23	19	6	15	23	347	57.2	50.1	12.7	--	--	--
17	Central Orange County	3176	361	2.3	1.7	356	0.142	0.097	0.079	2	15	4	3	6	15	364	70.9	52.1	13.3	--	--	--
17	I-5 Near Road##	3131	359	2.4	2.0	--	--	--	--	--	--	--	--	--	--	365	69.9	52.6	18.8	--	--	--
19	Saddleback Valley	3812	366	1.7	0.8	364	0.171	0.122	0.090	1	32	25	10	20	32	--	--	--	--	--	--	--
RIVERSIDE COUNTY																						
22	Corona/Norco Area	4155	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23	Metropolitan Riverside County 1	4144	361	1.9	1.4	348	0.143	0.115	0.102	6	81	59	27	46	81	359	66.4	54.1	13.6	356	2.2	1.7
23	Metropolitan Riverside County 3	4165	359	1.8	1.5	350	0.140	0.117	0.103	7	89	62	32	51	89	352	58.1	49.9	12.3	--	--	--
24	Perris Valley	4149	--	--	--	358	0.125	0.106	0.097	1	74	48	14	34	74	--	--	--	--	--	--	--
25	Elsinore Valley	4158	358	0.9	0.7	355	0.130	0.100	0.093	1	52	30	10	18	52	345	43.6	37.9	7.4	--	--	--
26	Temecula Valley	4031	--	--	--	364	0.108	0.091	0.084	0	37	20	2	5	37	--	--	--	--	--	--	--
29	San Gorgonio Pass	4164	--	--	--	358	0.150	0.115	0.104	3	68	48	21	29	68	363	51.1	47.1	8.5	--	--	--
30	Coachella Valley 1**	4137	365	0.8	0.5	360	0.119	0.094	0.089	0	49	28	5	9	49	365	47.4	34.3	6.6	--	--	--
30	Coachella Valley 2**	4157	--	--	--	358	0.097	0.084	0.081	0	42	17	0	2	42	--	--	--	--	--	--	--
30	Coachella Valley 3**	4032	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SAN BERNARDINO COUNTY																						
32	Northwest San Bernardino Valley	5175	364	1.5	1.1	360	0.158	0.123	0.116	15	114	87	43	82	114	364	55.4	44.8	13.9	--	--	--
33	I-10 Near Road##	5035	363	1.5	1.2	--	--	--	--	--	--	--	--	--	--	345	94.2	75.1	28.7	--	--	--
33	CA-60 Near Road##	5036	--	--	--	--	--	--	--	--	--	--	--	--	--	346	101.6	78.0	29.1	--	--	--
34	Central San Bernardino Valley 1	5197	358	1.7	1.2	348	0.151	0.111	0.105	8	89	65	27	56	89	360	66.4	57.9	18.7	363	2.5	1.7
34	Central San Bernardino Valley 2	5203	360	1.9	1.4	359	0.162	0.128	0.122	15	128	110	60	89	128	365	54.0	45.6	14.9	--	--	--
35	East San Bernardino Valley	5204	--	--	--	361	0.173	0.136	0.125	16	141	127	78	104	141	--	--	--	--	--	--	--
37	Central San Bernardino Mountains	5181	--	--	--	364	0.159	0.139	0.117	7	118	97	55	69	118	--	--	--	--	--	--	--
38	East San Bernardino Mountains	5818	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--
	DISTRICT MAXIMUM [e]			4.5	3.1		0.185	0.139	0.125	17	141	127	78	104	141		101.6	86.3	29.1		6.0	3.3
	SOUTH COAST AIR BASIN [f]			4.5	3.1		0.185	0.139	0.125	27	157	142	97	132	157		101.6	86.3	29.1		6.0	3.3

* Incomplete data. ** Salton Sea Air Basin -- Pollutant not monitored ppm - Parts Per Million parts of air, by volume ppb – Parts Per Billion parts of air, by volume AAM = Annual Arithmetic Mean

a) The federal and state 8-hour CO standards (9 ppm and 9.0 ppm) and the federal and state 1-hour CO standards (35 ppm and 20 ppm) were not exceeded.
b) The current (2015) O_3 federal standard was revised effective December 28, 2015.
c) The NO_2 federal 1-hour standard is100 ppb annual standard is annual arithmetic mean NO2 > 0.0534 ppm (53.4 ppb). The state 1-hour and annual standards are 0.18 ppm and 0.030 ppm.
d) The federal SO_2 1-hour standard is 75 ppb (0.075 ppm). The state standards are 1-hour average SO2 > 0.25 ppm (250 ppb) and 24-hour average SO2 > 0.04 ppm (40 ppb).
e) District Maximum is the maximum value calculated at any station in the South Coast AQMD Jurisdiction
f) Concentrations are the maximum value observed at any station in the South Coast Air Basin. Number of daily exceedances are the total number of days that the indicated concentration is exceeded at any station in the South Coast Air Basin
Four near-road sites measuring one or more of the pollutants $PM_{2.5}$, CO and/or NO_2 are operating near the following freeways: I-5, I-10, CA-60 and I-710.

South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4182
www.aqmd.gov

For information on the current standard levels and most recent revisions please refer to "Appendix II – Current Air Quality" of the "2016 AQMP" which can be accessed at http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/appendix-ii.pdf?sfvrsn=4. Maps showing the source/receptor area boundaries can be accessed via the Internet by entering your address in the South Coast AQMD Air Quality Forecast Map at www.aqmd.gov/forecast. A printed map or copy of the AQMP Appendix II is also available free of charge from the South Coast AQMD Public Information Center at 1-800-CUT-SMOG.

2020 AIR QUALITY
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

2020

Source/Receptor Area No.	Location	Station No.	Suspended Particulates PM10 e) k) +					Fine Particulates PM2.5 g) #					Lead i) ++		PM10 Sulfate j)	
			No. Days of Data	Max. Conc. in µg/m³ 24-hour	No. (%) Samples Exceeding Standards: Federal > 150 µg/m³ 24-hour	No. (%) Samples Exceeding Standards: State > 50 µg/m³ 24-hour	Annual. Average Conc. f) (AAM) µg/m³	No. Days of Data	Max. Conc. in µg/m³ 24-hour	98th Percentile Conc. in µg/m³ 24-hour	No (%) Samples Exceeding Federal Std. > 35 µg/m³ 24-hour	Annual. Average Conc. h) (AAM) µg/m³	Max. Monthly Average Conc. µg/m³	Max. 3-Months Rolling Averages µg/m³	No. Days of Data	Max. Conc. in µg/m³ 24-hour
LOS ANGELES COUNTY																
1	Central LA	087	337	77	0	24 (7%)	23.0	353	47.30	28.00	2 (1%)	12.31	0.013	0.011	45	3.3
2	Northwest Coastal LA County	091	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3	Southwest Coastal LA County	820	37	43	0	0	22.5	--	--	--	--	--	0.008	0.005	--	--
4	South Coastal LA County 1	072	--	--	--	--	--	117	28.10	26.10	0	11.26	--	--	--	--
4	South Coastal LA County 2	077	42	59	0	2 (5%)	24.9	357	39.00	28.00	1 (0%)	11.38	0.008	0.006	--	--
4	South Coastal LA County 3	033	12	54	0	2 (17%)	27.8	--	--	--	--	--	--	--	14	2.3
4	South Coastal LA County 4	039	--	--	--	--	--	--	--	--	--	--				
4	I-710 Near Road##	032	--	--	--	--	--	356	44.00	31.50	2 (1%)	12.93	--	--	--	--
6	West San Fernando Valley	074	--	--	--	--	--	116	27.60	26.40	0	10.13	--	--	--	--
7	East San Fernando Valley	200	--	--	--	--	--	--	--	--	--	--				
8	West San Gabriel Valley	088	--	--	--	--	--	117	34.90	31.20	0	11.06	--	--	--	--
9	East San Gabriel Valley 1	060	43	95	0	8 (19%)	37.7	116	33.00	25.80	0	11.13	0.010	0.007	45	3.1
9	East San Gabriel Valley 2	591	333	105	0	9 (3%)	25.2	--	--	--	--	--	--	--	--	--
10	Pomona/Walnut Valley	075	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11	South San Gabriel Valley	085	--	--	--	--	--	116	35.40	30.50	0	13.22	0.012	0.011	--	--
12	South Central LA County	112	--	--	--	--	--	352	43.20	34.10	7 (2%)	13.57	0.010	0.009	--	--
13	Santa Clarita Valley	090	36	48	0	0	22.5	--	--	--	--	--	--	--	--	--
ORANGE COUNTY																
16	North Orange County	3177	--	--	--	--	--	--	--	--	--	--	--	--	--	--
17	Central Orange County	3176	329	120	0	13 (4%)	23.9	355	41.40	27.10	1 (0%)	11.27	--	--	44	3.3
17	I-5 Near Road##	3131	--	--	--	--	--	--	--	--	--	--	--	--	--	--
19	Saddleback Valley	3812	42	53	0	1 (2%)	16.8	120	35.00	32.70	0	8.81	--	--	--	--
RIVERSIDE COUNTY																
22	Corona/Norco Area	4155	44	100	0	10 (23%)	39.1	--	--	--	--	--	--	--	--	--
23	Metropolitan Riverside County 1	4144	320	104	0	110 (34%)	30.0	357	41.00	29.60	4 (1%)	12.63	0.016	0.010	84	5.2
23	Metropolitan Riverside County 3	4165	304	124	0	154 (51%)	52.2	358	38.70	34.70	5 (1.%)	14.03	--	--	--	--
24	Perris Valley	4149	37	77	0	6 (16%)	35.9	--	--	--	--	--	--	--	--	--
25	Elsinore Valley	4158	334	84	0	7 (2%)	22.0	--	--	--	--	--	--	--	--	--
26	Temecula Valley	4031	--	--	--	--	--	--	--	--	--	--	--	--	--	--
29	San Gorgonio Pass	4164	42	46	0	0	19.2	--	--	--	--	--	--	--	--	--
30	Coachella Valley 1**	4137	251	48	0	0	20.4	122	23.90	16.90	0	6.42	--	--	--	--
30	Coachella Valley 2**	4157	317	77	0	8 (3%)	29.1	121	25.60	20.20	0	8.41	--	--	89	2.7
30	Coachella Valley 3**	4032	320	259	1 (0%)	69 (22%)	38.0	--	--	--	--	--	--	--	--	--
SAN BERNARDINO COUNTY																
32	Northwest San Bernardino Valley	5175	305	63	0	12 (4%)	30.5	--	--	--	--	--	--	--	--	--
33	I-10 Near Road##	5035	--	--	--	--	--	--	--	--	--	--	--	--	--	--
33	CA-60 Near Road##	5036	--	--	--	--	--	356	53.10	33.70	4 (1%)	14.36	--	--	--	--
34	Central San Bernardino Valley 1	5197	40	61	0	6 (15%)	35.8	117	46.10	27.40	1 (1%)	11.95	--	--	44	3.0
34	Central San Bernardino Valley 2	5203	320	80	0	81 (25%)	38.7	115	25.70	24.70	0	11.66	0.010	0.009	--	--
35	East San Bernardino Valley	5204	40	57	0	1 (3%)	23.4	--	--	--	--	--	--	--	--	--
37	Central San Bernardino Mountains	5181	40	51	0	1 (3%)	18.1	--	--	--	--	--	--	--	--	--
38	East San Bernardino Mountains	5818	--	--	--	--	--	58	24.30	20.40	0	7.62	--	--	--	--
	DISTRICT MAXIMUM l)			259	1	154	52.2		53.1	34.1	7	14.36	0.016	0.011		5.2
	SOUTH COAST AIR BASIN m)			124	0	173	52.2		53.1	34.1	13	14.36	0.016	0.011		5.2

* Incomplete data due to the site improvement. ** Salton Sea Air Basin µg/m³ – Micrograms per cubic meter of air AAM – Annual Arithmetic Mean -- Pollutant not monitored

\+ High PM10 (≥ 155 µg/m³) data recorded in the Coachella Valley and the Basin attributed to high winds are excluded because they likely meet the exclusion criteria specified in the U.S. EPA Exceptional Event Rule. Exceptional event demonstrations will be submitted to U.S. EPA for events that have regulatory significance.

\# PM2.5 concentrations above the 24-hour standard attributed to wildfire smoke and fireworks are excluded because they likely meet the exclusion criteria specified in the U.S. EPA Exceptional Event Rule. Exceptional event demonstrations will be submitted to U.S. EPA for events that have regulatory significance.

e) PM10 statistics listed above are based on combined Federal Reference Method (FRM) and Federal Equivalent Method (FEM) data.

f) State annual average (AAM) PM10 standard is 20 µg/m³. Federal annual PM10 standard (50 µg/m³) was revoked in 2006.

g) PM2.5 statistics listed above represent FRM data only with the exception of Central Orange County, I-710 Near Road, Metropolitan Riverside County 1 and 3, CA-60 Near Road, and South Coastal LA County 2 where FEM PM2.5 measurements are used to supplement missing FRM measurements because they pass the screening criteria in the South Coast AQMD Continuous Monitor Comparability Assessment and Request for Waiver dated July 1, 2021.

h) The Federal and State annual standards are 12.0 µg/m³.

i) Federal lead standard is 3-months rolling average > 0.15 µg/m³; state standard is monthly average ³ 1.5 µg/m³. Lead standards were not exceeded.

j) State sulfate standard is 24-hour ³ 25 µg/m³. There is no federal standard for sulfate.

k) Filter-based measurements for PM10 from March 28, 2020 to June 26, 2020 are not available due the COVID-19 Pandemic

l) District Maximum is the maximum value calculated at any station in the South Coast AQMD Jurisdiction

m) Concentrations are the maximum value observed at any station in the South Coast Air Basin. Number of daily exceedances are the total number of days that the indicated concentration is exceeded at any station in the South Coast Air Basin

++ Higher lead concentrations were recorded at near-source monitoring sites immediately downwind of stationary lead sources. Maximum monthly and 3-month rolling averages recorded were 0. 096 µg/m³ and 0.059 µg/m³, respectively.

Four near-road sites measuring one or more of the pollutants PM2.5, CO and/or NO2 are operating near the following freeways: I-5, I-10, CA-60 and I-710.

Monitor Values Report

Geographic Area: Los Angeles-Long Beach-Anaheim, CA
Pollutant: SO2
Year: 2022
Exceptional Events: Included (if any)

Note: The * indicates the mean does not satisfy minimum data completeness criteria.

Obs 1hr	First Max 1hr	Second Max 1hr	99th Percentile	Obs 24hr	First Max 24hr	Second Max 24hr	Days >STD	Annual Mean	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
8646	6.5	2.4	2	361	1.2	1.1	0	0.26	None	9	060371103	1630 N Main St, Los Angeles	Los Angeles	Los Angeles	CA	09
8538	6.1	5.6	4	357	1.5	1.3	0	0.47	None	1	060374009	1710 E. 20th Street	Signal Hill	Los Angeles	CA	09

Get detailed information about this report, including column descriptions, at https://www.epa.gov/outdoor-air-quality-data/about-air-data-reports#mon

AirData reports are produced from a direct query of the AQS Data Mart. The data represent the best and most recent information available to EPA from state agencies. However, some values may be absent due to incomplete reporting, and some values may change due to quality assurance activities. The AQS database is updated by state, local, and tribal organizations who own and submit the data.

Readers are cautioned not to rank order geographic areas based on AirData reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of the air quality for an entire county or urban area.

This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

Source: U.S. EPA AirData <https://www.epa.gov/air-data>
Generated: January 8, 2024

Monitor Values Report

Geographic Area: Los Angeles-Long Beach-Anaheim, CA
Pollutant: SO2
Year: 2021
Exceptional Events: Included (if any)
Note: The * indicates the mean does not satisfy minimum data completeness criteria.

Obs 1hr	First Max 1hr	Second Max 1hr	99th Percentile	Obs 24hr	First Max 24hr	Second Max 24hr	Days >STD	Annual Mean	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
8695	2.2	2.1	2	365	1.2	1	0	0.39	None	9	060371103	1630 N Main St, Los Angeles	Los Angeles	Los Angeles	CA	09
8588	5.9	5.5	4	360	1.3	1.2	0	0.45	None	1	060374009	1710 E. 20th Street	Signal Hill	Los Angeles	CA	09
6060	7.7	5.6	4	254	1.5	1.1	0	0.14*	None	1	060375005	7201 W. Westchester Parkway	Los Angeles	Los Angeles	CA	09

Get detailed information about this report, including column descriptions, at https://www.epa.gov/outdoor-air-quality-data/about-air-data-reports#mon

AirData reports are produced from a direct query of the AQS Data Mart. The data represent the best and most recent information available to EPA from state agencies. However, some values may be absent due to incomplete reporting, and some values may change due to quality assurance activities. The AQS database is updated by state, local, and tribal organizations who own and submit the data.

Readers are cautioned not to rank order geographic areas based on AirData reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of the air quality for an entire county or urban area.

This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

Source: U.S. EPA AirData <https://www.epa.gov/air-data>
Generated: January 8, 2024

Monitor Values Report

Geographic Area: Los Angeles-Long Beach-Anaheim, CA
Pollutant: SO2
Year: 2020
Exceptional Events: Included (if any)

Note: The * indicates the mean does not satisfy minimum data completeness criteria.

Obs 1hr	First Max 1hr	Second Max 1hr	99th Percentile	Obs 24hr	First Max 24hr	Second Max 24hr	Days >STD	Annual Mean	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
7920	3.8	3.7	3	333	0.9	0.8	0	0.23*	None	9	060371103	1630 N Main St, Los Angeles	Los Angeles	Los Angeles	CA	09
8612	6	4.9	3	361	1.2	0.9	0	0.31	None	1	060375005	7201 W. Westchester Parkway	Los Angeles	Los Angeles	CA	09

Get detailed information about this report, including column descriptions, at https://www.epa.gov/outdoor-air-quality-data/about-air-data-reports#mon

AirData reports are produced from a direct query of the AQS Data Mart. The data represent the best and most recent information available to EPA from state agencies. However, some values may be absent due to incomplete reporting, and some values may change due to quality assurance activities. The AQS database is updated by state, local, and tribal organizations who own and submit the data.

Readers are cautioned not to rank order geographic areas based on AirData reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of the air quality for an entire county or urban area.

This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

Source: U.S. EPA AirData <https://www.epa.gov/air-data>
Generated: January 8, 2024

APPENDIX F – OPERATIONAL HRA MODELING RESULTS

Model
Cancer Risk
Chronic Risk
Acute Risk

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Maximum Cancer Risk by Pollutant at PMI, MEIR, and MEIW
FRB Landfill RNG Facility - Operations - Elevated Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2402	receptor #	11	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,928	3,731,026	433,054	3,730,131	433,145	3,731,325
		30-Year Cancer Risk	Contribution (%)	30-Year Cancer Risk	Contribution (%)	25-Year Cancer Risk	Contribution (%)
-	ALL	1.68E-08	100%	3.89E-09	100%	2.18E-10	100%
106990	1,3-Butadiene	4.03E-10	2.39%	1.94E-10	4.98%	2.15E-11	9.83%
75354	1,1-Dichloroethene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75343	1,1-Dichloroethane	3.11E-12	0.02%	6.60E-13	0.02%	5.20E-14	0.02%
107062	1,2-Dichloroethane	4.70E-10	2.79%	9.99E-11	2.57%	7.88E-12	3.61%
71556	1,1,1-Trichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
79005	1,1,2-Trichloroethane	8.83E-13	0.01%	4.25E-13	0.01%	4.71E-14	0.02%
79345	1,1,2,2-Tetrachloroethane	5.12E-12	0.03%	2.47E-12	0.06%	2.73E-13	0.13%
75070	Acetaldehyde	5.06E-11	0.30%	1.84E-11	0.47%	1.88E-12	0.86%
107028	Acrolein	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7664417	Ammonia	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
71432	Benzene	5.78E-09	34.35%	1.27E-09	32.68%	1.03E-10	46.94%
205992	Benzo(b)fluoranthene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
56235	Carbon Tetrachloride	2.70E-12	0.02%	1.30E-12	0.03%	1.44E-13	0.07%

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2402	receptor #	11	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,928	3,731,026	433,054	3,730,131	433,145	3,731,325
		30-Year Cancer Risk	Contribution (%)	30-Year Cancer Risk	Contribution (%)	25-Year Cancer Risk	Contribution (%)
108907	Chlorobenzene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
67663	Chloroform	3.55E-12	0.02%	8.23E-13	0.02%	6.89E-14	0.03%
218019	Chrysene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
100414	Ethyl Benzene	5.39E-11	0.32%	1.26E-11	0.32%	1.01E-12	0.46%
106934	Ethylene Dibromide	5.39E-12	0.03%	2.59E-12	0.07%	2.87E-13	0.13%
50000	Formaldehyde	6.40E-10	3.80%	2.55E-10	6.56%	2.68E-11	12.28%
110543	Hexane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75092	Methylene Chloride	6.48E-11	0.39%	1.38E-11	0.35%	1.09E-12	0.50%
67561	Methanol	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
91203	Naphthalene	3.84E-11	0.23%	1.15E-11	0.29%	1.08E-12	0.50%
1151	PAH	8.02E-09	47.66%	1.73E-09	44.52%	3.23E-11	14.76%
100425	Styrene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
127184	Tetrachloroethene	4.23E-10	2.51%	8.97E-11	2.30%	7.06E-12	3.23%
108883	Toluene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
79016	Trichloroethylene	3.44E-11	0.20%	7.31E-12	0.19%	5.75E-13	0.26%
75014	Vinyl Chloride	8.29E-10	4.92%	1.76E-10	4.53%	1.39E-11	6.37%
1330207	Xylenes	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%

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Cancer Risk by Source for All Pollutants Combined at PMI, MEIR, and MEIW
FRB Landfill RNG Facility - Operations - Elevated Terrain AERMOD Run

Sources	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
	receptor #	2402	receptor #	11	receptor #	2
	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
	433,928	3,731,026	433,054	3,730,131	433,145	3,731,325
	30-Year Cancer Risk	Contribution (%)	30-Year Cancer Risk	Contribution (%)	25-Year Cancer Risk	Contribution (%)
ALL	1.68E-08	100%	3.89E-09	100%	2.18E-10	100%
FLARE	3.29E-10	1.95%	1.03E-10	2.66%	3.00E-12	1.37%
ICE	8.39E-10	4.99%	4.04E-10	10.38%	5.63E-11	25.77%
TOU	1.38E-08	82.07%	2.93E-09	75.34%	1.59E-10	72.86%

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Maximum Chronic Hazard Index by Pollutant at PMI, MEIR, MEIW and Sensitive Receptor
FRB Landfill RNG Facility - Operations - Elevated Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2406	receptor #	11	receptor #	2	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		434,113	3,731,310	433,054	3,730,131	433,145	3,731,325	433,145	3,731,325
		Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic 8-hr Hazard Index	Contribution (%)
-	ALL	6.02E-05	100%	1.28E-05	100%	1.49E-05	100%	6.95E-06	100%
106990	1,3-Butadiene	1.37E-06	2.27%	2.39E-07	1.86%	3.18E-07	2.14%	7.07E-08	1.02%
75354	1,1-Dichloroethene	9.25E-09	0.02%	2.69E-09	0.02%	2.55E-09	0.02%	0.00E+00	0.00%
75343	1,1-Dichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
107062	1,2-Dichloroethane	1.77E-08	0.03%	5.13E-09	0.04%	4.86E-09	0.03%	0.00E+00	0.00%
71556	1,1,1-Trichloroethane	4.39E-10	0.00%	1.28E-10	0.00%	1.21E-10	0.00%	0.00E+00	0.00%
79005	1,1,2-Trichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
79345	1,1,2,2-Tetrachloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75070	Acetaldehyde	9.97E-08	0.17%	1.94E-08	0.15%	2.39E-08	0.16%	1.12E-08	0.16%
107028	Acrolein	3.69E-05	61.31%	7.13E-06	55.69%	8.84E-06	59.48%	4.42E-06	63.54%
7664417	Ammonia	1.23E-05	20.34%	3.56E-06	27.81%	3.38E-06	22.72%	0.00E+00	0.00%
71432	Benzene	2.24E-05	37.13%	6.26E-06	48.91%	6.08E-06	40.90%	6.08E-06	87.39%
205992	Benzo(b)fluoranthene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
56235	Carbon Tetrachloride	1.83E-09	0.00%	3.20E-10	0.00%	4.26E-10	0.00%	0.00E+00	0.00%
108907	Chlorobenzene	1.77E-07	0.29%	5.15E-08	0.40%	4.87E-08	0.33%	0.00E+00	0.00%

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Maximum Chronic Hazard Index by Pollutant at PMI, MEIR, MEIW and Sensitive Receptor
FRB Landfill RNG Facility - Operations - Elevated Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2406	receptor #	11	receptor #	2	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		434,113	3,731,310	433,054	3,730,131	433,145	3,731,325	433,145	3,731,325
		Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic 8-hr Hazard Index	Contribution (%)
67663	Chloroform	8.09E-10	0.00%	2.14E-10	0.00%	2.15E-10	0.00%	0.00E+00	0.00%
218019	Chrysene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
100414	Ethyl Benzene	3.51E-09	0.01%	1.07E-09	0.01%	1.03E-09	0.01%	0.00E+00	0.00%
106934	Ethylene Dibromide	1.10E-07	0.18%	1.92E-08	0.15%	2.55E-08	0.17%	0.00E+00	0.00%
50000	Formaldehyde	1.06E-05	17.59%	2.00E-06	15.60%	2.52E-06	16.99%	2.52E-06	36.30%
110543	Hexane	5.05E-10	0.00%	1.48E-10	0.00%	1.40E-10	0.00%	0.00E+00	0.00%
75092	Methylene Chloride	5.02E-08	0.08%	1.46E-08	0.11%	1.38E-08	0.09%	0.00E+00	0.00%
67561	Methanol	3.16E-09	0.01%	5.51E-10	0.00%	7.34E-10	0.00%	0.00E+00	0.00%
91203	Naphthalene	7.13E-08	0.12%	1.57E-08	0.12%	1.78E-08	0.12%	0.00E+00	0.00%
1151	PAH	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
100425	Styrene	5.45E-11	0.00%	9.50E-12	0.00%	1.26E-11	0.00%	0.00E+00	0.00%
127184	Tetrachloroethene	6.19E-07	1.03%	1.80E-07	1.41%	1.71E-07	1.15%	0.00E+00	0.00%
108883	Toluene	6.05E-07	1.00%	1.76E-07	1.37%	1.67E-07	1.12%	8.43E-08	1.21%
79016	Trichloroethylene	8.83E-09	0.01%	2.57E-09	0.02%	2.43E-09	0.02%	0.00E+00	0.00%
75014	Vinyl Chloride	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
1330207	Xylenes	2.81E-07	0.47%	8.16E-08	0.64%	7.73E-08	0.52%	0.00E+00	0.00%

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Chronic Hazard Index by Source for All Pollutants Combined at PMI, MEIR, MEIW and Sensitive Receptor
FRB Landfill RNG Facility - Operations - Elevated Terrain AERMOD Run

Sources	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)		Maximally Exposed Individual Worker (MEIW)	
	receptor #	2406	receptor #	11	receptor #	2	receptor #	2
	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
	434,113	3,731,310	433,054	3,730,131	433,145	3,731,325	433,145	3,731,325
	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic 8-hr Hazard Index	Contribution (%)
ALL	6.02E-05	100%	1.28E-05	100%	1.49E-05	100%	6.95E-06	100%
FLARE	1.84E-07	0.31%	6.62E-08	0.52%	6.45E-08	0.43%	5.82E-08	0.84%
ICE	4.06E-05	67.44%	7.08E-06	55.30%	9.43E-06	63.51%	5.80E-06	83.35%
TOU	2.01E-05	33.42%	5.86E-06	45.78%	5.55E-06	37.36%	5.55E-06	79.82%

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Maximum Acute Hazard Index by Pollutant at PMI, MEIR, and MEIW
FRB Landfill RNG Facility - Operations - Elevated Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2405	receptor #	10	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		434,106	3,731,282	433,233	3,730,037	433,145	3,731,325
		Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)
-	ALL	1.28E-02	100%	2.07E-03	100%	2.51E-03	100%
106990	1,3-Butadiene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75354	1,1-Dichloroethene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75343	1,1-Dichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
107062	1,2-Dichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
71556	1,1,1-Trichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
79005	1,1,2-Trichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
79345	1,1,2,2-Tetrachloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75070	Acetaldehyde	5.31E-05	0.41%	8.57E-06	0.41%	1.04E-05	0.41%
107028	Acrolein	9.39E-03	73.35%	1.51E-03	73.29%	1.84E-03	73.32%
7664417	Ammonia	3.24E-05	0.25%	6.86E-06	0.33%	7.47E-06	0.30%
71432	Benzene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
205992	Benzo(b)fluoranthene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
56235	Carbon Tetrachloride	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
108907	Chlorobenzene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
67663	Chloroform	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2405	receptor #	10	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		434,106	3,731,282	433,233	3,730,037	433,145	3,731,325
		Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)
218019	Chrysene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
100414	Ethyl Benzene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
106934	Ethylene Dibromide	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
50000	Formaldehyde	3.32E-03	25.96%	5.36E-04	25.93%	6.50E-04	25.94%
110543	Hexane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75092	Methylene Chloride	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
67561	Methanol	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
91203	Naphthalene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
1151	PAH	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
100425	Styrene	5.02E-09	0.00%	8.09E-10	0.00%	9.82E-10	0.00%
127184	Tetrachloroethene	3.37E-08	0.00%	7.75E-09	0.00%	8.20E-09	0.00%
108883	Toluene	2.56E-06	0.02%	5.20E-07	0.03%	5.75E-07	0.02%
79016	Trichloroethylene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75014	Vinyl Chloride	9.23E-10	0.00%	1.88E-10	0.00%	2.08E-10	0.00%
1330207	Xylenes	3.55E-07	0.00%	7.63E-08	0.00%	8.27E-08	0.00%

Target Organ(s)	Target Organ(s)	Target Organ(s)
EYE	EYE	EYE

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Acute Hazard Index by Source for All Pollutants Combined at PMI, MEIR, and MEIW
FRB Landfill RNG Facility - Operations - Elevated Terrain AERMOD Run

Sources	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
	receptor #	2405	receptor #	10	receptor #	2
	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
	434,106	3,731,282	433,233	3,730,037	433,145	3,731,325
	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)
ALL	1.28E-02	100%	2.07E-03	100%	2.51E-03	100%
FLARE	9.40E-07	0.01%	3.05E-07	0.01%	1.98E-07	0.01%
ICE	1.27E-02	99.55%	2.05E-03	99.36%	2.49E-03	99.44%
TOU	5.66E-05	0.44%	1.30E-05	0.63%	1.38E-05	0.55%

Target Organ(s)	Target Organ(s)	Target Organ(s)
EYE	EYE	EYE

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Maximum Cancer Risk by Pollutant at PMI, MEIR, and MEIW
FRB Landfill RNG Facility - Operations - Flat Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2405	receptor #	11	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		434,106	3,731,282	433,054	3,730,131	433,145	3,731,325
		30-Year Cancer Risk	Contribution (%)	30-Year Cancer Risk	Contribution (%)	25-Year Cancer Risk	Contribution (%)
-	ALL	1.41E-08	100%	4.27E-09	100%	2.68E-10	100%
106990	1,3-Butadiene	1.17E-09	8.27%	2.04E-10	4.77%	2.83E-11	10.56%
75354	1,1-Dichloroethene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75343	1,1-Dichloroethane	1.92E-12	0.01%	6.46E-13	0.02%	6.22E-14	0.02%
107062	1,2-Dichloroethane	2.92E-10	2.07%	9.79E-11	2.29%	9.43E-12	3.51%
71556	1,1,1-Trichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
79005	1,1,2-Trichloroethane	2.56E-12	0.02%	4.46E-13	0.01%	6.21E-14	0.02%
79345	1,1,2,2-Tetrachloroethane	1.48E-11	0.11%	2.59E-12	0.06%	3.61E-13	0.13%
75070	Acetaldehyde	9.58E-11	0.68%	1.90E-11	0.44%	2.44E-12	0.91%
107028	Acrolein	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
7664417	Ammonia	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
71432	Benzene	3.94E-09	27.96%	1.25E-09	29.29%	1.24E-10	46.12%
205992	Benzo(b)fluoranthene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
56235	Carbon Tetrachloride	7.80E-12	0.06%	1.36E-12	0.03%	1.90E-13	0.07%

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2405	receptor #	11	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		434,106	3,731,282	433,054	3,730,131	433,145	3,731,325
		30-Year Cancer Risk	Contribution (%)	30-Year Cancer Risk	Contribution (%)	25-Year Cancer Risk	Contribution (%)
108907	Chlorobenzene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
67663	Chloroform	2.79E-12	0.02%	8.15E-13	0.02%	8.42E-14	0.03%
218019	Chrysene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
100414	Ethyl Benzene	3.47E-11	0.25%	1.23E-11	0.29%	1.20E-12	0.45%
106934	Ethylene Dibromide	1.56E-11	0.11%	2.72E-12	0.06%	3.79E-13	0.14%
50000	Formaldehyde	1.39E-09	9.86%	2.65E-10	6.20%	3.50E-11	13.04%
110543	Hexane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75092	Methylene Chloride	4.04E-11	0.29%	1.35E-11	0.32%	1.30E-12	0.49%
67561	Methanol	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
91203	Naphthalene	5.07E-11	0.36%	1.16E-11	0.27%	1.37E-12	0.51%
1151	PAH	6.24E-09	44.26%	2.12E-09	49.65%	3.86E-11	14.37%
100425	Styrene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
127184	Tetrachloroethene	2.61E-10	1.85%	8.78E-11	2.06%	8.44E-12	3.15%
108883	Toluene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
79016	Trichloroethylene	2.13E-11	0.15%	7.15E-12	0.17%	6.88E-13	0.26%
75014	Vinyl Chloride	5.17E-10	3.67%	1.73E-10	4.05%	1.67E-11	6.21%
1330207	Xylenes	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%

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Cancer Risk by Source for All Pollutants Combined at PMI, MEIR, and MEIW
FRB Landfill RNG Facility - Operations - Flat Terrain AERMOD Run

Sources	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
	receptor #	2405	receptor #	11	receptor #	2
	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
	434,106	3,731,282	433,054	3,730,131	433,145	3,731,325
	30-Year Cancer Risk	Contribution (%)	30-Year Cancer Risk	Contribution (%)	25-Year Cancer Risk	Contribution (%)
ALL	1.41E-08	100%	4.27E-09	100%	2.68E-10	100%
FLARE	2.89E-10	2.05%	1.24E-10	2.90%	3.52E-12	1.31%
ICE	3.06E-09	21.69%	5.34E-10	12.50%	7.43E-11	27.70%
TOU	1.07E-08	76.26%	3.61E-09	84.60%	1.90E-10	70.99%

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Maximum Chronic Hazard Index by Pollutant at PMI, MEIR, MEIW and Sensitive Receptor
FRB Landfill RNG Facility - Operations - Flat Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2405	receptor #	11	receptor #	2	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		434,106	3,731,282	433,054	3,730,131	433,145	3,731,325	433,145	3,731,325
		Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic 8-hr Hazard Index	Contribution (%)
-	ALL	7.45E-05	100%	1.64E-05	100%	1.89E-05	100%	9.03E-06	100%
106990	1,3-Butadiene	1.81E-06	2.42%	3.15E-07	1.92%	4.20E-07	2.22%	9.33E-08	1.03%
75354	1,1-Dichloroethene	9.88E-09	0.01%	3.32E-09	0.02%	3.05E-09	0.02%	0.00E+00	0.00%
75343	1,1-Dichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
107062	1,2-Dichloroethane	1.89E-08	0.03%	6.32E-09	0.04%	5.82E-09	0.03%	0.00E+00	0.00%
71556	1,1,1-Trichloroethane	4.69E-10	0.00%	1.58E-10	0.00%	1.45E-10	0.00%	0.00E+00	0.00%
79005	1,1,2-Trichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
79345	1,1,2,2-Tetrachloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75070	Acetaldehyde	1.27E-07	0.17%	2.52E-08	0.15%	3.10E-08	0.16%	1.45E-08	0.16%
107028	Acrolein	4.72E-05	63.38%	9.27E-06	56.49%	1.15E-05	60.52%	5.73E-06	63.43%
7664417	Ammonia	1.31E-05	17.58%	4.39E-06	26.75%	4.04E-06	21.34%	0.00E+00	0.00%
71432	Benzene	2.44E-05	32.78%	7.75E-06	47.24%	7.33E-06	38.72%	7.33E-06	81.16%
205992	Benzo(b)fluoranthene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
56235	Carbon Tetrachloride	2.42E-09	0.00%	4.22E-10	0.00%	5.62E-10	0.00%	0.00E+00	0.00%

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Maximum Chronic Hazard Index by Pollutant at PMI, MEIR, MEIW and Sensitive Receptor
FRB Landfill RNG Facility - Operations - Flat Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2405	receptor #	11	receptor #	2	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		434,106	3,731,282	433,054	3,730,131	433,145	3,731,325	433,145	3,731,325
		Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic 8-hr Hazard Index	Contribution (%)
108907	Chlorobenzene	1.89E-07	0.25%	6.34E-08	0.39%	5.83E-08	0.31%	0.00E+00	0.00%
67663	Chloroform	9.11E-10	0.00%	2.66E-10	0.00%	2.62E-10	0.00%	0.00E+00	0.00%
218019	Chrysene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
100414	Ethyl Benzene	3.71E-09	0.00%	1.31E-09	0.01%	1.22E-09	0.01%	0.00E+00	0.00%
106934	Ethylene Dibromide	1.45E-07	0.19%	2.53E-08	0.15%	3.37E-08	0.18%	0.00E+00	0.00%
50000	Formaldehyde	1.37E-05	18.35%	2.60E-06	15.88%	3.29E-06	17.37%	3.29E-06	36.41%
110543	Hexane	5.39E-10	0.00%	1.82E-10	0.00%	1.67E-10	0.00%	0.00E+00	0.00%
75092	Methylene Chloride	5.37E-08	0.07%	1.79E-08	0.11%	1.65E-08	0.09%	0.00E+00	0.00%
67561	Methanol	4.17E-09	0.01%	7.28E-10	0.00%	9.69E-10	0.01%	0.00E+00	0.00%
91203	Naphthalene	8.73E-08	0.12%	2.00E-08	0.12%	2.26E-08	0.12%	0.00E+00	0.00%
1151	PAH	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
100425	Styrene	7.19E-11	0.00%	1.25E-11	0.00%	1.67E-11	0.00%	0.00E+00	0.00%
127184	Tetrachloroethene	6.61E-07	0.89%	2.22E-07	1.35%	2.04E-07	1.08%	0.00E+00	0.00%
108883	Toluene	6.47E-07	0.87%	2.16E-07	1.32%	1.99E-07	1.05%	1.01E-07	1.12%
79016	Trichloroethylene	9.43E-09	0.01%	3.17E-09	0.02%	2.91E-09	0.02%	0.00E+00	0.00%
75014	Vinyl Chloride	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
1330207	Xylenes	3.00E-07	0.40%	1.01E-07	0.61%	9.25E-08	0.49%	0.00E+00	0.00%

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Chronic Hazard Index by Source for All Pollutants Combined at PMI, MEIR, MEIW and Sensitive Receptor
FRB Landfill RNG Facility - Operations - Flat Terrain AERMOD Run

Sources	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)		Maximally Exposed Individual Worker (MEIW)	
	receptor #	2405	receptor #	11	receptor #	2	receptor #	2
	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
	434,106	3,731,282	433,054	3,730,131	433,145	3,731,325	433,145	3,731,325
	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic Hazard Index	Contribution (%)	Chronic 8-hr Hazard Index	Contribution (%)
ALL	7.45E-05	100%	1.64E-05	100%	1.89E-05	100%	9.03E-06	100%
FLARE	1.85E-07	0.25%	7.93E-08	0.48%	7.58E-08	0.40%	6.83E-08	0.76%
ICE	5.36E-05	71.91%	9.36E-06	57.03%	1.25E-05	65.76%	7.65E-06	84.68%
TOU	2.15E-05	28.85%	7.22E-06	44.03%	6.64E-06	35.06%	6.64E-06	73.50%

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Maximum Acute Hazard Index by Pollutant at PMI, MEIR, and MEIW
FRB Landfill RNG Facility - Operations - Flat Terrain AERMOD Run

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2403	receptor #	10	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,975	3,731,132	433,233	3,730,037	433,145	3,731,325
		Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)
-	ALL	2.19E-02	100%	2.76E-03	100%	3.34E-03	100%
106990	1,3-Butadiene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75354	1,1-Dichloroethene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75343	1,1-Dichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
107062	1,2-Dichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
71556	1,1,1-Trichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
79005	1,1,2-Trichloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
79345	1,1,2,2-Tetrachloroethane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75070	Acetaldehyde	9.08E-05	0.41%	1.14E-05	0.41%	1.39E-05	0.41%
107028	Acrolein	1.60E-02	73.37%	2.02E-03	73.29%	2.45E-03	73.32%
7664417	Ammonia	4.88E-05	0.22%	9.14E-06	0.33%	9.95E-06	0.30%
71432	Benzene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
205992	Benzo(b)fluoranthene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
56235	Carbon Tetrachloride	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
108907	Chlorobenzene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%

Pollutant CAS	Pollutant	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
		receptor #	2403	receptor #	10	receptor #	2
		UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
		433,975	3,731,132	433,233	3,730,037	433,145	3,731,325
		Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)
67663	Chloroform	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
218019	Chrysene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
100414	Ethyl Benzene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
106934	Ethylene Dibromide	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
50000	Formaldehyde	5.68E-03	25.97%	7.15E-04	25.93%	8.67E-04	25.94%
110543	Hexane	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75092	Methylene Chloride	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
67561	Methanol	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
91203	Naphthalene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
1151	PAH	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
100425	Styrene	8.58E-09	0.00%	1.08E-09	0.00%	1.31E-09	0.00%
127184	Tetrachloroethene	4.82E-08	0.00%	1.03E-08	0.00%	1.09E-08	0.00%
108883	Toluene	3.94E-06	0.02%	6.93E-07	0.03%	7.66E-07	0.02%
79016	Trichloroethylene	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
75014	Vinyl Chloride	1.42E-09	0.00%	2.51E-10	0.00%	2.77E-10	0.00%
1330207	Xylenes	5.30E-07	0.00%	1.02E-07	0.00%	1.10E-07	0.00%

Target Organ(s)	Target Organ(s)	Target Organ(s)
EYE	EYE	EYE

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Acute Hazard Index by Source for All Pollutants Combined at PMI, MEIR, and MEIW
FRB Landfill RNG Facility - Operations - Flat Terrain AERMOD Run

Sources	Point of Maximum Impact (PMI)		Maximally Exposed Individual Resident (MEIR)		Maximally Exposed Individual Worker (MEIW)	
	receptor #	2403	receptor #	10	receptor #	2
	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)	UTM Easting (m)	UTM Northing (m)
	433,975	3,731,132	433,233	3,730,037	433,145	3,731,325
	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)	Acute Hazard Index	Contribution (%)
ALL	2.19E-02	100%	2.76E-03	100%	3.34E-03	100%
FLARE	1.65E-06	0.01%	4.06E-07	0.01%	2.64E-07	0.01%
ICE	2.18E-02	99.63%	2.74E-03	99.35%	3.32E-03	99.44%
TOU	8.10E-05	0.37%	1.74E-05	0.63%	1.83E-05	0.55%

Target Organ(s)	Target Organ(s)	Target Organ(s)
EYE	EYE	EYE

APPENDIX C: BIOLOGICAL RESOURCES STUDIES

BIOLOGICAL SURVEY REPORT

Bowerman Power Renewable Natural Gas Plant Project
Frank R. Bowerman Landfill
Orange County, CA

October 2024

Prepared by

TETRA TECH

5383 Hollister Ave, Suite 130
Santa Barbara, CA 93111

EXECUTIVE SUMMARY

On behalf of Bowerman Power LFG, LLC (BP, Project Proponent), Tetra Tech has prepared this Biological Survey Report for the proposed Renewable Natural Gas (RNG) Plant planned at the Frank R. Bowerman Landfill (Bowerman Landfill) in Orange County, California (Project). This Report describes the literature review, survey methodology, and results of the biological survey conducted for the Project. This Project is being planned under a partnership agreement between BP and OC Waste & Recycling (OCWR) to process the landfill gas (LFG) produced by the Bowerman Landfill and deliver it to Southern California Gas Company (SoCal Gas).

A literature review, biological surveys, vegetation mapping, and habitat assessments for potential special-status species[1] were conducted in 2023. Potentially-occurring rare plants were surveyed for during their blooming period when they were identifiable, and one species was detected: intermediate mariposa lily (*Calochortus weedii* var. *intermedius*). Note that rainfall for the Irvine area in 2022-23 was measured at about 163 percent of normal (Golden Gate Weather Services 2023) which resulted in suitable conditions for blooming plant species. The biological survey area (BSA) also provides suitable nesting habitat for tree-nesting, shrub-nesting, and/or ground-nesting birds, including the Federally-listed threatened coastal California gnatcatcher (*Polioptila californica californica*). Raptor nesting habitat is also present in the form of mature trees onsite. No nests were observed during the survey. The BSA has the potential to support other special-status species such as western spadefoot (*Spea hammondii*), orange-throated whiptail (*Aspidoscelis hyperythra*), red-diamond rattlesnake (*Crotalus ruber*), and coast patch-nosed snake (*Salvadora hexalepis virgultea*).

This report provides impact avoidance, minimization, and mitigation recommendations for special-status species, including intermediate mariposa lily and potential nesting birds, as required by the Central Coastal Subregional Natural Community Conservation Plan and Habitat Conservation Plan (NCCP/HCP).

[1] Plant and wildlife species protected by Federal, State, and local agencies as well as conservation organizations such as the California Native Plant Society (CNPS) are collectively referred to as special-status species in this report.

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Acronyms and Abbreviations

BIOS	Biogeographic and Information Observation System
Bowerman Landfill	Frank R. Bowerman Landfill
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
ECA	Essential Connectivity Area
GIS	Geographic Information System
GPS	Global Positioning System
LFG	landfill gas
LFGTE	Landfill Gas to Energy
BP	Bowerman Power LFG, LLC
NCCP/HCP	Natural Community Conservation Plan and Habitat Conservation Plan
NLB	Natural Landscape Block
OCWR	OC Waste & Recycling
RNG	renewable natural gas
ROW	right-of-way
SoCal Gas	Southern California Gas Company
SSC	Species of Special Concern
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WL	Watch List

1.0 INTRODUCTION

Tetra Tech has prepared this Biological Survey Report for the proposed Renewable Natural Gas (RNG) Plant planned at the Frank R. Bowerman Landfill (Bowerman Landfill) in Orange County, California (Project). This Project is being planned under a partnership agreement between Bowerman Power LFG, LLC (BP) and OC Waste & Recycling (OCWR) to process the landfill gas (LFG) produced by the Bowerman Landfill and deliver it to Southern California Gas Company (SoCal Gas). The purpose of this Biological Survey Report is to:

- Document the methods and results of the field surveys,
- Summarize the existing biological resources and conditions within the biological survey area (BSA) and vicinity,
- Assess potential presence of special-status wildlife and rare plants, and
- Recommend preliminary measures for avoiding, minimizing, or mitigating impacts to special-status species.

From July 1, 2022 through June 30, 2023, rainfall for the Irvine area was measured at about 163 percent of normal. This high rainfall resulted in suitable conditions to conduct the biological surveys (Golden Gate Weather Services 2023).

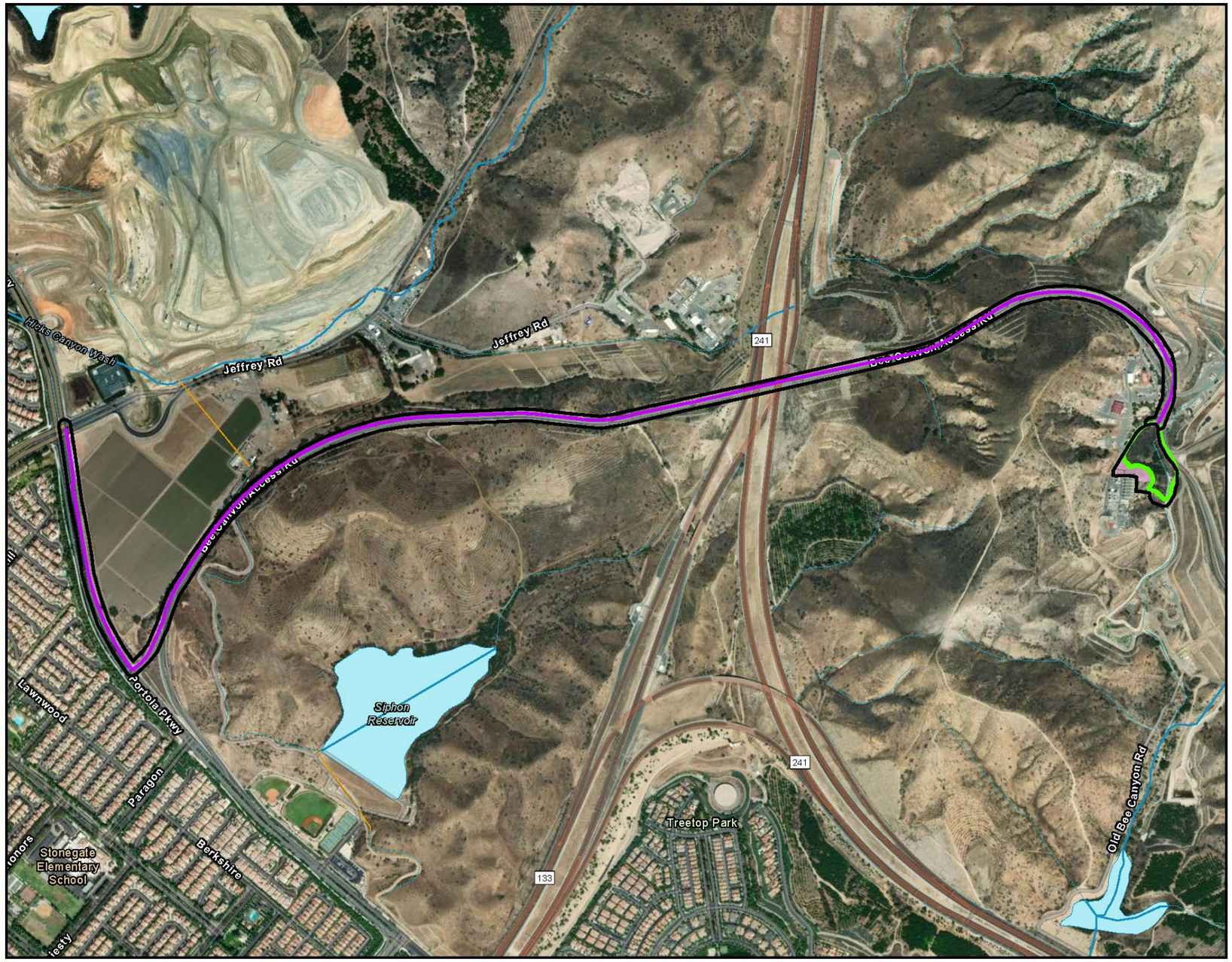
1.1 Project Location

The proposed Project is located at Bowerman Landfill in Orange County, California and consists of the proposed RNG Plant footprint (i.e., Project site), Fuel Modification Area, and a proposed pipeline route (Figure 1). The Project site is generally bound by Bee Canyon Access Road to the north and northeast, the existing Landfill Gas to Energy (LFGTE) plant and flare station to the west, and open space and roads to the south (Figure 2). The Fuel Modification Area is adjacent to the Project site and will be cleared of vegetation and revegetated post construction with approved low fuel vegetation (Figure 2). The proposed pipeline route connecting the proposed RNG Plant to the SoCal Gas interconnection goes north and west along Bee Canyon Access Road to the intersection of Jeffrey Road and Portola Parkway (Figure 1). The site is located within the U.S. Geological Survey (USGS) *El Toro* 7.5-Minute Topographic Quadrangle Map (Figure 3). Surrounding land uses consist of other areas of the Bowerman Landfill, open space, residential uses, and highways and roads.

The BSA shown in Figures 1 to 5 includes the Project site, Fuel Modification Area, and proposed pipeline. The BSA around the Project site ended at the adjacent road (Bee Canyon Access Road) because the area between the Project site and BSA is developed and does not support biological resources. The Project site consists of the proposed RNG Plant footprint. A 50-foot buffer on either side of the proposed pipeline route was also surveyed.

1.2 Ecoregion

California can be divided into 11 Geomorphic Provinces. The proposed Project is located within the Peninsular Ranges Geomorphic Province, which is a series of ranges separated by northwest trending valleys, almost parallel to faults branching from the San Andreas Fault. The Peninsular Ranges extend into lower California and are bound on the east by the Colorado Desert Geomorphic Province. The Los Angeles Basin and the Southern Channel Islands (Santa Catalina, Santa Barbara, San Clemente, and San Nicolas islands), together with the surrounding continental shelf, are included in this province (California Department of Conservation, California Geological Survey 2002). In addition, the Project is located within the South Coast Subregion of the Southwestern California Region of the California Floristic Province (Jepson Flora Project [eds.] 2023).



Legend

- Survey Area
- Pipeline Route
- Project Site
- Fuel Modification Area

Hydrology (USGS 2023)

- Perennial Stream
- Ephemeral/Intermittent Stream
- Pipeline

N

0 500 1,000 2,000 Feet

Figure 1. Regional Location
Bowerman RNG Project

Prepared For: Bowerman RNG

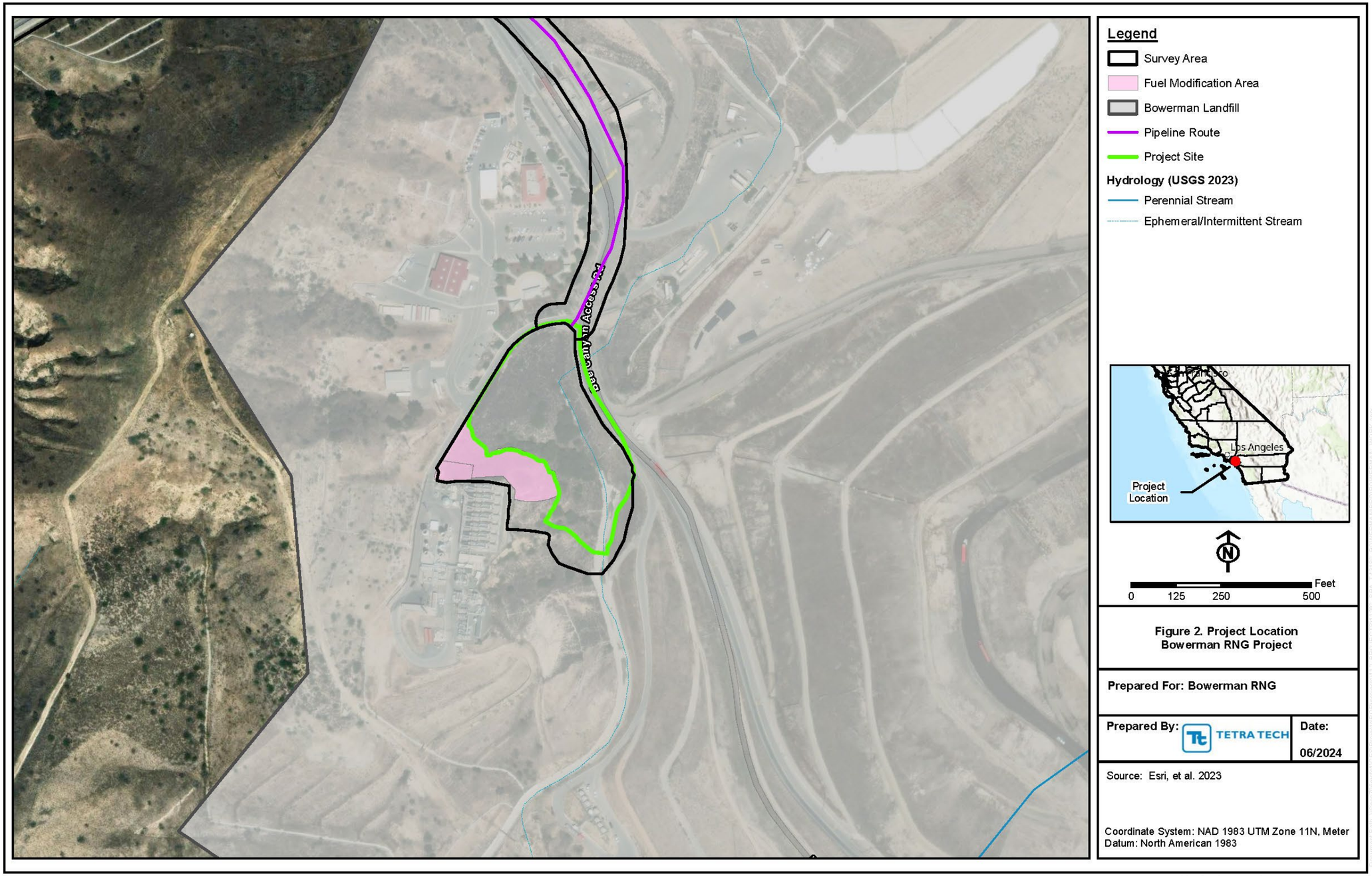
Prepared By: TETRA TECH

Date: 06/2024

Source: Esri, et al. 2023

Coordinate System: NAD 1983 UTM Zone 11N, Meter
Datum: North American 1983

Not for Construction



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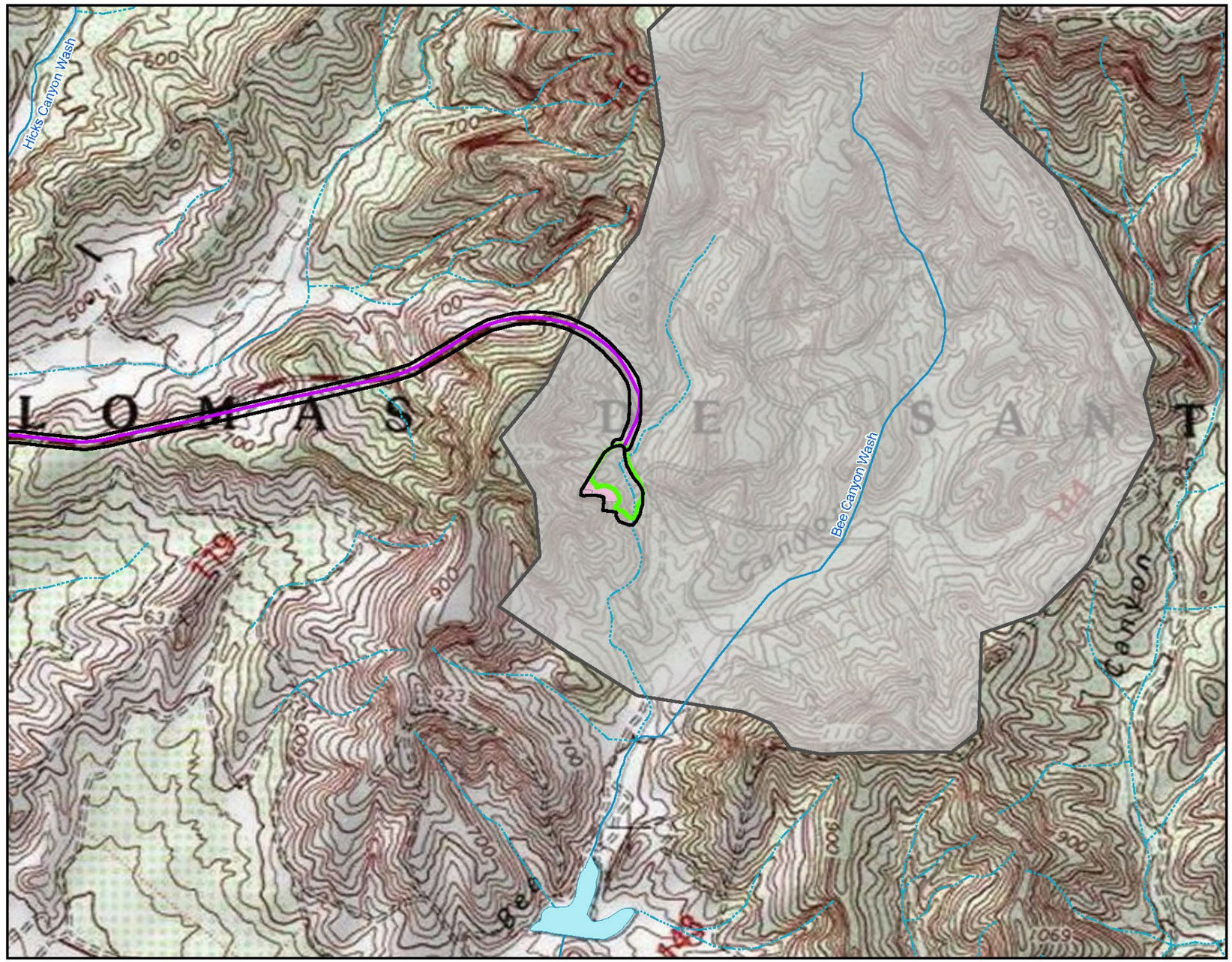

Legend

- Survey Area
- Fuel Modification Area
- Bowerman Landfill
- Pipeline Route
- Project Site

Hydrology (USGS 2023)

- Perennial Stream
- Ephemeral/Intermittent Stream

N

0 500 1,000 2,000 Feet

Figure 3. USGS Topographic Map
Bowerman RNG Project

Prepared For: Bowerman RNG

Prepared By: TETRA TECH

Date: 06/2024

Source: Esri, et al. 2023

Coordinate System: NAD 1983 UTM Zone 11N, Meter
Datum: North American 1983

Not for Construction

2.0 PROJECT DESCRIPTION

The proposed Project would develop a RNG Plant and pipeline to process and transport LFG that is produced by the Bowerman Landfill to the SoCal Gas pipeline. The RNG Plant site would be approximately 3.52 acres in size and the proposed pipeline would extend approximately 2.4 miles. The RNG Plant would be designed to process a maximum of 6,000 standard cubic feet per minute of raw LFG at the inlet. The process would remove nitrogen, oxygen, carbon dioxide, sulfur hydroxide, hydrogen sulfide, volatile organic compounds, and other minor impurities to meet the specifications of SoCal Gas. An additional approximately 0.8-acres will be cleared of vegetation, see the Fuel Modification Area in Figure 2, to comply with Orange County Fire Authority's Fuel Modification and Maintenance Program. Post construction, this area will be revegetated with approved low fuel vegetation.

3.0 LITERATURE REVIEW

This section describes the literature review performed to evaluate the biological resources that occur within the BSA.

3.1 Topography

Methods

The USGS 7.5-Minute Topographic Map *El Toro* Quadrangle as well as aerial imagery (Google Earth©) were reviewed. Topography describes the physical features of an area of land. The potential topographic features looked at include natural landforms, aquatic features, developed lands, agricultural lands, undeveloped lands, and terrain. Natural landforms are natural physical features on the surface of the land, such as mountains, hills, and canyons.

Results

The topography of the Project site consists of hilly terrain throughout. A concrete channel is located at its southern end and conveys water from ephemeral drainages. Surrounding land uses include the larger Bowerman Landfill, agricultural land, open space, highways and roads, and residential built-up land. The elevational range of the Project site is approximately 690 to 800 feet above mean sea level. The elevational range of the proposed pipeline route is approximately 330 to 810 feet above mean sea level.

3.2 Sensitive Natural Communities

Methods

The California Department of Fish and Wildlife (CDFW)'s California Natural Diversity Database (CNDDB) (CDFW 2023a) was used to identify sensitive natural communities that exist within the BSA.

Results

No sensitive natural communities were identified (CDFW 2023a).

3.3 Special-status Plant and Wildlife Species

Methods

Plant and wildlife species protected by Federal, State, and local agencies as well as conservation organizations such as the California Native Plant Society (CNPS) are collectively referred to as special-status species in this report. Tetra Tech conducted a literature review by using CDFW's CNDDB RareFind 5 online database and CNPS' online *Inventory of Rare and Endangered Plants of California* to identify special-status plant and wildlife species that may exist within the BSA (CDFW 2023a, CNPS 2023). Species from the CNDDB and CNPS' online inventory that do not have habitat in the BSA, such as freshwater marsh and open water, are not carried forward in the analysis.

Results

The potential for each species to occur has been reviewed and updated based on the results of the field surveys and is discussed in the special-status species results section of this report.

3.4 Critical Habitat

Methods

The U.S. Fish and Wildlife Service (USFWS) Critical Habitat Portal was reviewed to identify designated final and proposed Critical Habitat for Federally threatened and endangered plant or wildlife species within the BSA (USFWS 2023).

Results

The literature review determined that the BSA is not located within or near designated or proposed Critical Habitat.

3.5 Wildlife Movement

Methods

The Essential Connectivity Map located on CDFW's Biogeographic and Information Observation System (BIOS) Habitat Connectivity Viewer was reviewed to determine whether the BSA is located within or near a CDFW designated Natural Landscape Block (NLB) or Essential Connectivity Area (ECA) (CDFW 2023b).

Results

Per the BIOS Habitat Connectivity Viewer, the BSA is located within a NLB but not within an ECA (CDFW 2023b). Although the larger Bowerman Landfill is adjacent to large areas of open space, including Limestone Canyon Nature Preserve and the Irvine Ranch Natural Landmarks, the BSA is located near other developed areas of the Bowerman Landfill where human presence and noise may deter wildlife from using the area. Therefore, while the BSA may provide cover and forage for local wildlife and migrating birds, it is unlikely to provide a significant wildlife movement corridor. In addition, the Project site and Fuel Modification Area consists of a relatively small footprint that would not substantially reduce habitat connectivity in the region. The ability of wildlife to move through adjacent areas would be unaffected.

4.0 FIELD SURVEY METHODS

Biological surveys, including a rare plant survey, were conducted on June 19 and 20, 2023. The surveys were conducted during daylight hours and not during abnormal or excessive cold, heat, wind, rain, or other inclement weather. An Eos Arrow 100 sub-meter Global Positioning System (GPS) unit and a paired tablet running the Geographic Information System (GIS) Field Maps application were used to collect location and attribute data during the surveys. Representative photographs that were taken during the surveys are provided in Appendix A.

The biological surveys were conducted to assess vegetation communities, plant and wildlife species observed, and presence/absence of special-status species that have the potential to occur within the BSA. The BSA includes the Project site (i.e., RNG Plant footprint), Fuel Modification Area, and the proposed pipeline (plus a 50-foot buffer on either side). The survey area around the Project site ended at the adjacent road because the area between the Project site and survey area is developed and does not support biological resources. Any wildlife species or their sign (e.g., nests, burrows, pellets, scat/guano, tracks, roosts) observed or detected during the surveys was recorded and mapped to sub-meter accuracy. Vegetation communities were mapped during the surveys based on dominant plant species present. In addition, potential bird nesting habitat was identified.

The surveys were timed to occur during June when potential rare plant species were in bloom and identifiable. Pedestrian transect surveys were conducted within potential rare plant habitat to survey for rare plants. All rare plants found (i.e., intermediate mariposa lily [*Calochortus weedii* var. *intermedius*]) were mapped to sub-meter accuracy and the number of individuals observed in each population was recorded. A list of all plant and wildlife species observed onsite was recorded (see Tables 1 and 2 in Section 5.1).

5.0 FIELD SURVEY RESULTS

5.1 List of Plants and Wildlife

Plant and wildlife species observed in the BSA are listed in Tables 1 and 2. One rare plant species, intermediate mariposa lily, was found but no special-status wildlife species were observed.

Table 1. Plant Species Observed

Scientific Name	Common Name	Native/Non-Native
Acacia sp.	Acacia	Non-Native
Acmispon glaber	Deerweed	Native
Ambrosia acanthicarpa	Annual bur-sage	Native
Ambrosia psilostachya	Western ragweed	Native
Antirrhinum nuttallianum	Nuttall's snapdragon	Native
Artemisia californica	California sagebrush	Native
Avena sp.	Oat	Non-Native
Baccharis salicifolia	Mule fat	Native
Brachypodium distachyon	False brome	Non-Native
Bromus diandrus	Ripgut grass	Non-Native
Bromus madritensis	Foxtail chess	Non-Native
Calochortus weedii* var. *intermedius	**Intermediate mariposa lily**	**Native**
Calystegia macrostegia	Island morning glory	Native
Centaurea melitensis	Tocalote	Non-Native
Cuscuta californica	California dodder	Native
Cynodon dactylon	Bermuda grass	Non-Native
Daucus sp.	Wild carrot	Native
Deinandra fasciculata	Clustered tarweed	Native
Diplacus aurantiacus	Orange Bush Monkeyflower	Native
Dudleya lanceolata	Lance-leaved dudleya	Native
Dudleya pulverulenta	Chalk dudleya	Native
Encelia californica	Bush sunflower	Native
Encelia farinosa	Brittlebush	Native
Erigeron sp.	Fleabane	Native
Eriogonum fasciculatum	California buckwheat	Native
Eriophyllum confertiflorum	Golden-yarrow	Native
Eschscholzia californica	California poppy	Native
Eucalyptus sp.	Eucalyptus	Non-Native
Foeniculum vulgare	Fennel	Native
Hedypnois rhagadioloides	Crete weed	Non-Native
Helianthus annus	Common sunflower	Native
Hesperoyucca whipplei	Chaparral yucca	Native
Heteromeles arbutifolia	Toyon	Native

Scientific Name	Common Name	Native/Non-Native
Heterotheca grandiflora	Telegraph weed	Native
Hirschfeldia incana	Mediterranean hoary mustard	Non-Native
Hordeum murinum	wall barley	Non-Native
Isocoma menziesii	Menzies' goldenbush	Native
Lactuca serriola	Prickly lettuce	Non-Native
Lysimachia arvensis	Scarlet pimpernel	Non-Native
Malacothamnus fasciculatus	Chaparral mallow	Native
Malacothrix saxatilis	Cliff aster	Native
Malosma laurina	Laurel sumac	Native
Malva parviflora	Cheeseweed	Non-Native
Marah sp.	Man-root	Native
Marrubium vulgare	White horehound	Non-Native
Melilotus albus	White sweetclover	Non-Native
Melilotus indicus	Sourclover	Non-Native
Mesembryanthemum crystallinum	Crystalline iceplant	Non-Native
Nicotiana glauca	Tree tobacco	Non-Native
Oncosiphon pilulifer	Stinknet	Non-Native
Opuntia littoralis	Coast prickly pear	Native
Pennisetum setaceum	Crimson fountain grass	Non-Native
Phacelia parryi	Parry's phacelia	Native
Pinus sp.	Conifers	Native
Polypogon monspeliensis	Annual beard grass	Non-Native
Quercus agrifolia	Coast live oak	Native
Rhus integrifolia	Lemonade berry	Native
Salsola tragus	Russian thistle	Non-Native
Salvia apiana	White sage	Native
Salvia mellifera	Black sage	Native
Sequoia sp.	Redwoods	Native
Silene laciniata	Cardinal catchfly	Native
Solanum douglasii	Douglas' nightshade	Native
Sonchus oleraceus	Common sow thistle	Non-Native
Verbesina encelioides	Golden crownbeard	Non-Native
Vicia villosa	Hairy vetch	Non-Native

Species in bold text have special-status designation.

Table 2. Wildlife Species Observed

Scientific Name	Common Name	Federal/State Status
Invertebrates		
Apis sp.	Honeybee	None
Coccinellinae	Lady beetles	None
Estigmene sp.	Salt marsh moth	None
Odonata	Dragonflies	None
Papilio sp.	Swallowtails	None
Pepsis sp.	Tarantula hawk	None
Pierinae sp.	Whites (butterfly)	None
Reptiles		
Sceloporus occidentalis	Western fence lizard	None
Birds		
Buteo jamaicensis	Red-tailed hawk	None
Calypte anna	Anna's hummingbird	None
Cathartes aura	Turkey vulture	None
Chamaea fasciata	Wrentit	None
Corvus corax	Common raven	None
Haemorhous mexicanus	House finch	None
Melospiza melodia	Song sparrow	None
Mimus polyglottos	Northern mockingbird	None
Passerina amoena	Lazuli bunting	None
Pipilo maculatus	Spotted towhee	None
Psaltriparus minimus	Bushtit	None
Sayornis nigricans	Black phoebe	None
Spinus psaltria	Lesser goldfinch	None
Thryomanes bewickii	Bewick's wren	None
Mammals		
Odocoileus hemionus	Mule deer	None

5.2 Vegetation Communities

The BSA contains multiple vegetation communities, as described below. Table 3 summarizes the vegetation communities observed and their corresponding acreages within the Project site and Fuel Modification Area, BSA (not including pipeline), and proposed pipeline. Vegetation communities are shown in Figure 4.

Table 3. Vegetation Communities

Vegetation Communities	Acres within Project Site and Fuel Modification Area	Acres within BSA (not including pipeline)	Acres along Proposed Pipeline
Sagebrush scrub	2.9	3.6	6.8
Disturbed sagebrush scrub	0.0	0.0	0.2
Coast live oak	0.9	0.9	0.0

Vegetation Communities	Acres within Project Site and Fuel Modification Area	Acres within BSA (not including pipeline)	Acres along Proposed Pipeline
Eucalyptus	0.0	0.0	1.2
Ornamental trees	0.0	0.0	1.0
Disturbed	0.0	0.0	2.4
Developed	0.2	0.3	18.4
Total	**4.0**	**4.8**	**30.0**

Situated on a northeast-facing slope, the Project site and Fuel Modification Area are covered primarily by inland sage scrub (hereinafter referred to as sagebrush scrub), with bands of coast live oak (*Quercus agrifolia*) habitat present. Within the bounds of the Project site is an approximately 35-foot wide, unvegetated concrete channel. Multiple concrete-lined channels of approximately one-foot width run downslope from the existing LFGTE plant or Bee Canyon Access Road into a wider concrete channel. Soils covered in natural vegetation were generally loose and gravelly. Burrows were not noticeable in areas of natural vegetation because vegetation coverage was dense.

The proposed pipeline route survey area covers Bee Canyon Access Road, Portola Parkway, and these road rights-of-way (ROW) as well as a 50-foot survey buffer on either side of the pipeline (Figure 4). However, direct impacts from pipeline construction will be limited to the existing developed roads. Within the survey buffers outside of the road ROW are some naturally occurring (sagebrush scrub), naturalized (eucalyptus grove), artificial (ornamental trees), and disturbed habitats.

Sagebrush Scrub: Sagebrush scrub covers about 73 percent of the Project site and Fuel Modification Area. This habitat type has over 100 percent vegetation coverage. The dominant shrub within the habitat is California sagebrush (*Artemisia californica*). Interspersed within the California sagebrush are native species such as California buckwheat (*Eriogonum fasciculatum*), deerweed (*Acmispon glaber*) and brittlebrush (*Encelia farinosa).* Native succulent species like coast prickly pear (*Opuntia littoralis*), chalk dudleya (*Dudleya pulverulenta*), and lance-leaved dudleya (*Dudleya lanceolata*) are also found interspersed in this habitat. Rock outcrops are present at the top of some of the steep slopes in the sagebrush scrub, mostly bordering the existing facility to the west. Along the edges of this habitat adjacent to the existing facility and spaced between shrubs are patches of non-native species like Mediterranean hoary mustard (*Hirschfeldia incana*) and prickly lettuce (*Lactuca serriola*). Immediately surrounding the existing facility are also non-native grass species, such as oat (*Avena* sp.). Within the sagebrush scrub that occurs along the margins of the coast live oak habitat are populations of the rare plant, intermediate mariposa lily.

The sagebrush scrub habitat adjacent to the proposed pipeline route occurs on a slope and is covered by California buckwheat and California sagebrush. One-foot wide, unvegetated concrete channels run along the roadside and through this habitat.

Disturbed sagebrush scrub occurs adjacent to the proposed pipeline route along the north side of Bee Canyon Access Road near Portola Parkway where there is a gravel pad covered in low-growing (under 1-foot tall) California buckwheat. Interspersed within the buckwheat are ruderal species such as Mediterranean hoary mustard and clustered tarweed (*Deinandra fasciculata*). This area appears to be disturbed by adjacent construction activities.

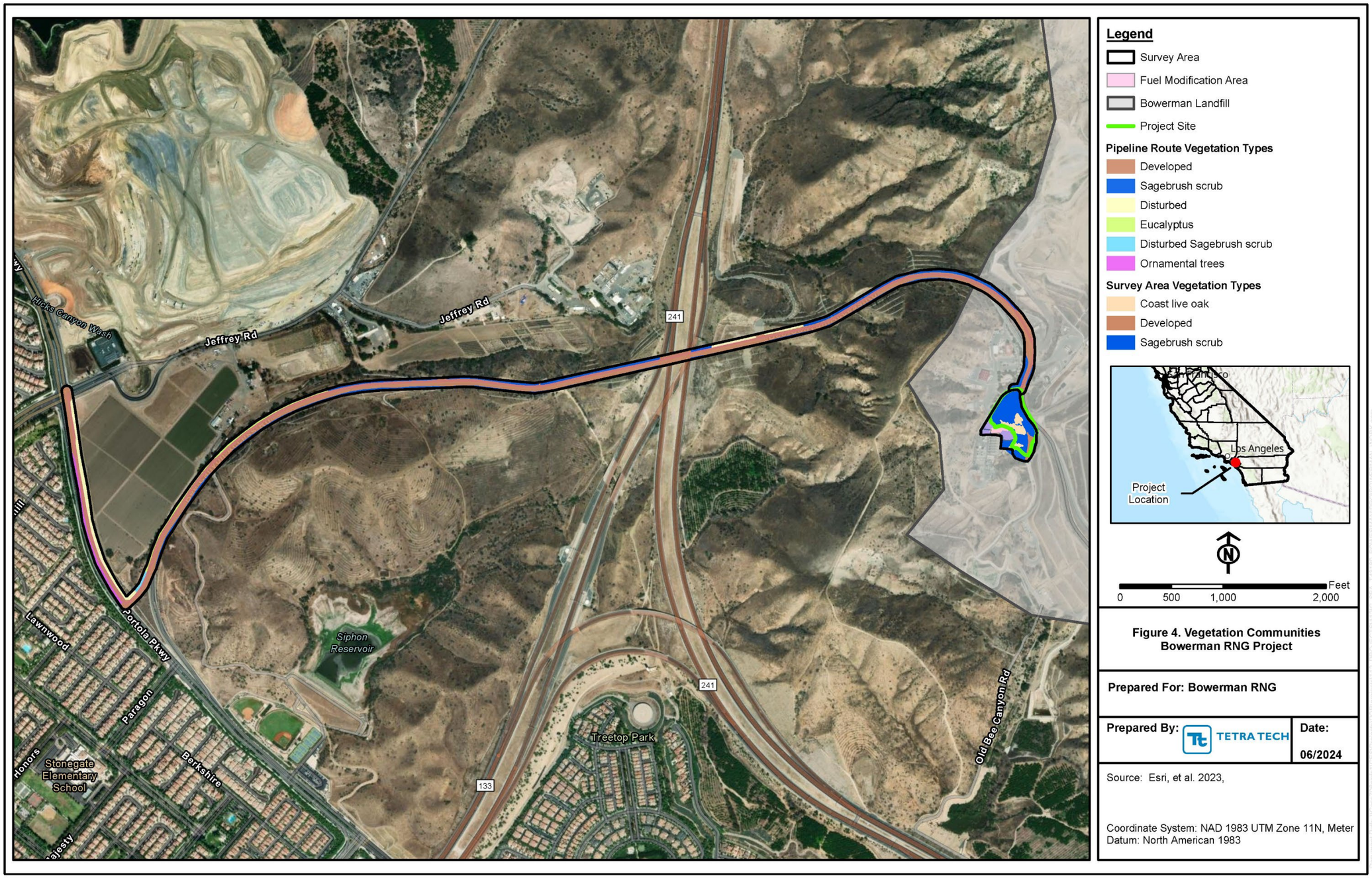

Figure 4. Vegetation Communities
Bowerman RNG Project

Prepared For: Bowerman RNG

Prepared By: TETRA TECH **Date:** 06/2024

Source: Esri, et al. 2023,

Coordinate System: NAD 1983 UTM Zone 11N, Meter
Datum: North American 1983

Not for Construction

Coast Live Oak: Within the Project site and Fuel Modification Area, coast live oaks dominate the tree canopy along the slope. The tree understory is comprised of non-native grasses, like ripgut grass (*Bromus diandrus*) and foxtail chess (*Bromus madritensis*), and sparse coverage of low-growing sagebrush scrub species, like California buckwheat.

Eucalyptus: A strip of eucalyptus (*Eucalyptus* sp.) grove habitat runs along the north side of Bee Canyon Access Road adjacent to the proposed pipeline route. Eucalyptus trees over 15-feet tall dominate this tree canopy. Eucalyptus trees under 8-feet tall, annual grasses, and leaf litter comprise the understory.

Ornamental Trees: Along the south side of Portola Parkway are trees planted for roadside beautification adjacent to the proposed pipeline route. Tree species include acacias (*Acacia* sp.), conifers (*Pinus* sp.), and redwood (*Sequoia* sp.) species. Within the ROW are paved sidewalks and utility boxes.

Disturbed: Hardpan pads along Bee Canyon Access Road adjacent to the proposed pipeline route are vegetated with primarily non-native ruderal species like Mediterranean hoary mustard in addition to very few colonizing shrubs of California sagebrush. Habitat disturbed by current agricultural practices also occurs on the north side of Portola Parkway adjacent to the proposed pipeline route.

Developed: Developed areas within the Project site include the concrete channel that runs from north to south at the base of the slope and along Bee Canyon Access Road. Water runoff from the existing LFGTE facility is fed into this channel through smaller concrete channels and culverts at the north end of the main channel. The main channel bed is filled with soil debris and feeds into an isolated evaporation/collection pool south of the existing facility. Disturbed areas along the proposed pipeline route encompass Bee Canyon Access Road, Portola Parkway, and any structures in and along these roads, such as fencing and gates.

5.3 Raptor and Nesting Bird Habitat

All vegetated areas of the BSA provide suitable nesting habitat for tree-nesting, shrub-nesting, and/or ground-nesting birds. Raptor nesting habitat is present in the form of mature coast live oak trees in the coast live oak habitat in the Project site and Fuel Modification Area and in the eucalyptus tree groves and ornamental trees in the buffer area along the proposed pipeline route.

One raptor species, red-tailed hawk (*Buteo jamaicensis*), was observed during the surveys, as well as other bird species that may nest onsite. However, no nests were observed during the surveys.

5.4 Special-status Wildlife Species

5.4.1 Amphibians

The western spadefoot (*Spea hammondii*) is a CDFW Species of Special Concern (SSC) and an Identified Species under the Central Coastal Subregional Natural Community Conservation Plan and Habitat Conservation Plan (NCCP/HCP) that has been previously documented 0.3 mile south of the Project site (CDFW 2023a). The closest breeding habitat is 1.5 miles northwest of the Project site (CDFW 2023a). There are no permanent pools within the BSA that would allow for sustained breeding for this species; therefore, it is unlikely that the onsite upland habitat supports transient individuals

moving from breeding habitat to estivating habitat on a continual basis. However, it should be noted that four adults were observed in an offsite evaporation/collection pool south of the existing facility in 2017 (CDFW 2023a). Because of this and due to the presence of concrete channels, there could be a slight possibility that ephemeral pooling conditions may occur for sufficiently long enough periods during the rainy season to potentially support temporal spadefoot habitat - but regular or sustained occurrence onsite is unlikely.

5.4.2 Reptiles

Orange-throated whiptail (*Aspidoscelis hyperythra*) is a CDFW Watch List (WL) species and is a Target Species under the NCCP/HCP. This species has been previously recorded within less than 0.1 mile of the Project site (CDFW 2023a) and is known to occur in semi-arid brushy areas with loose soil and rocks, in rocky hillside and chaparral habitats. Some of these preferred habitat characteristics for this species are present within the BSA.

Red-diamond rattlesnake (*Crotalus ruber*) is a CDFW SSC and an Identified Species under the NCCP/HCP. This species has been previously recorded 2 miles northeast of the Project site (CDFW 2023a) and is known to occur in arid scrub, coastal chaparral, oak and pine woodlands, and rocky grassland. Some of these preferred habitat characteristics for this species are present within the BSA.

Coast horned lizard (*Phrynosoma blainvillii*) is a CDFW SSC that has been recorded 2 miles northeast of the Project site (CDFW 2023a). The species requires open habitat with loose soils and an abundant supply of ants or other insects. Given the dense vegetation present in the BSA, coast horned lizard is unlikely to occur.

The coast patch-nosed snake (*Salvadora hexalepis virgultea*) is a CDFW SSC that has also been recorded 2 miles northwest of the Project site (CDFW 2023a). This species requires semi-arid brushy areas and chaparral in canyons, rocky hillsides, and plains. Some of these preferred habitat characteristics for this species are present within the BSA.

5.4.3 Birds

The coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*) is a CDFW SSC and a Target Species under the NCCP/HCP. The nearest recorded occurrence in the CNDDB is 0.6 mile west of the Project site in 1990; however, this did not include records of nesting (CDFW 2023a). Cactus wren has also been found in the vicinity of the Project site within the larger Bowerman Landfill in 1995, 2002, 2003, and 2005; the nearest record is approximately 1,250 feet away from 2003 (County of Orange Integrated Waste Management Department 2006). It is a resident of the coastal sage scrub plant community but is closely associated with three species of cacti and occurs in thickets of cholla (*Opuntia prolifera*) and coast prickly pear dominated stands of coastal sage scrub (County of Orange Integrated Waste Management Department 2006). Parts of the Bowerman Landfill provide suitable habitat for the coastal cactus wren, particularly within the southern cactus scrub plant community (County of Orange Integrated Waste Management Department 2006). Southern cactus scrub occurs in limited locations within the Bowerman Landfill, where vegetative cover is typically dense, approaching 100 percent, and coast prickly pear comprises a minimum of 20 percent relative cover with other sage scrub species (County of Orange Integrated Waste Management Department 2006). Coast prickly pear were observed onsite in low numbers during the survey but not in thickets or

stands or at or above 20 percent relative cover. No southern cactus scrub was mapped within the BSA. Therefore, the BSA is unlikely to support coastal cactus wren nesting.

Yellow-breasted chat (*Icteria virens*) is a CDFW SSC that has been recorded 1.5 miles southeast of the Project site (CDFW 2023a). During this occurrence, two pairs were observed but nesting was not observed. This species occurs in riparian habitats with a well-developed shrub layer and an open canopy. Suitable habitat requirements for this species are not present in or near the BSA.

The coastal California gnatcatcher (*Polioptila californica californica*) is a federally threatened species, a CDFW SSC, and Target Species under the NCCP/HCP. The nearest recorded occurrence is along the western boundary of the Project site and the southern boundary of the proposed pipeline route (CDFW 2023a). Additional nesting observations have been recorded at the Siphon Reservoir, which is 1.5 miles west of the Project site and 0.5 mile south of the proposed pipeline route (CDFW 2023a). Foraging habitat onsite includes California buckwheat, California sagebrush, and coast prickly pear. As such, suitable habitat requirements are found in the BSA for this species.

The least Bell's vireo (*Vireo bellii pusillus*) is a federally and state endangered species and is a Conditionally Covered Species under the NCCP/HCP. The nearest known occurrence for this species is at the Siphon Reservoir approximately 1.5 miles west of the Project site and 0.5 mile south of the proposed pipeline route (CDFW 2023a). However, this species' habitat consists of low-elevation riparian species in proximity to water or in dry river bottoms. They typically nest in willows, coyote brush, or mesquite. As such, preferred nesting habitat for this species does not exist within the BSA.

5.5 Rare Plants

Rare plants searched for in the BSA included intermediate mariposa lily and many-stemmed dudleya (*Dudleya multicaulis*). Robinson's pepper-grass (*Lepidium virginicum var. robinsonii)* and intermediate monardella (*Monardella hypoleuca* ssp. *intermedia*) also had potential to occur. Intermediate mariposa lily, a CNPS California Rare Plant Rank (CRPR) 1B.2 species and Conditionally Covered Species under the NCCP/HCP, was the only rare plant observed during the surveys. Populations with a total of 17 individuals occurred within the center of the proposed RNG Plant site. A population with 2 individuals was found outside the Project site and Fuel Modification Area but within the BSA near the existing LFGTE plant and flare station (Figure 5). Table 4 provides additional details on the intermediate mariposa lily populations observed.

Table 4. Rare Plant Survey Results

Intermediate Mariposa Lily Points	Number of Individuals
1	1
2	1
3	1
4	6
5	1
6	2
7	3
8	1

Intermediate Mariposa Lily Points	Number of Individuals
9	1
10*	2
TOTAL	**19**

*This population is located outside of the Project site and Fuel Modification Area.

Legend

- Survey Area
- Fuel Modification Area
- Project Site
- Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*)

N

0 50 100 200 Feet

Figure 5. Intermediate Mariposa Lily Occurrences
Bowerman RNG Project

Prepared For: Bowerman RNG

Prepared By: TETRA TECH **Date:** 06/2024

Source: Esri, et al. 2023

Coordinate System: NAD 1983 UTM Zone 11N, Meter
Datum: North American 1983

Not for Construction

5.6 Summary of Special-status Species

Based on the results of the field surveys, the potential to occur for each special-status plant and wildlife species has been reviewed and updated, as described in Table 5. Species are not included in the table that have no habitat in the BSA, such as species that only use tidal, coastal dune, or montane woodland habitats.

Table 5. Special-Status Species with Potential to Occur

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Probability To Occur Within the Project Site and Fuel Modification Area	Probability To Occur Within the Pipeline Buffer
Plants						
Calochortus weedii var. *intermedius*	Intermediate mariposa-lily	None	CRPR 1B.2	During the June 2023 survey, 19 individuals of this plant were observed; 17 individuals are located within the Project site and 2 individuals are outside of the Project site. None were found within the Fuel Modification Area. There are 16 recorded observations of this species within 2 miles of the BSA, with five recorded observations being immediately outside of the Project site (CDFW 2023a). This plant is found on dry, rocky slopes at less than 680 meters elevation. Its blooming period is June to July.	Observed in sagebrush scrub habitat.	Medium in undisturbed sagebrush scrub. Unlikely to occur elsewhere.
Dudleya multicaulis	Many-stemmed dudleya	None	CRPR 1B.2	Although individuals of lanceleaf liveforever were found in the BSA, no many-stemmed dudleya individuals were observed. The closest known occurrence of many-stemmed dudleya is located approximately 2 miles from the Project site in a nature reserve within Limestone Canyon Regional Park (CDFW 2023a). This plant is found in clay soils on coastal plains and sandstone outcrops at less than 600 meters elevation. Its blooming period is from May to June.	Although there is medium potential for this species to occur in sagebrush scrub, it was not observed during the field surveys.	Medium in undisturbed sagebrush scrub. Unlikely to occur elsewhere.
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass	None	CRPR 4.3	Previously recorded observations have been documented 2 miles north of the Project site along a riverbank (CDFW 2023a). This species' habitat consists of dry, disturbed areas, cliffs, and scrub. This plant is found at elevations less than 2,800 meters. Its blooming period is from March to June.	Although there is medium potential for this species to occur in sagebrush scrub and oak habitat, it was not observed during the field surveys.	Medium in sagebrush scrub. Unlikely to occur elsewhere.

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Probability To Occur Within the Project Site and Fuel Modification Area	Probability To Occur Within the Pipeline Buffer
Monardella hypoleuca ssp. *intermedia*	Intermediate monardella	None	CRPR 1B.3	One large population is documented in the Limestone Canyon Regional Park 2 miles northeast of the Project site (CDFW 2023a). This species' habitat consists of chaparral, oak woodland, and dry slopes. This plant is found at an elevation of 200 to 1,250 meters. Its blooming period is from June to September.	Medium in area of oak habitat.	Unlikely to occur due to lack of habitat.
Amphibians						
Spea hammondii	Western spadefoot	None	SSC	The nearest recorded observation for western spadefoot is 0.3 mile south of the Project site. In 2017, four adults were observed in evaporation/collection pool south of the existing facility (CDFW 2023a). The nearest recorded breeding habitat is 1.5 miles northwest of the Project site (CDFW 2023a). The Project site is 0.75 mile from the nearest natural pool of water. This species requires pooling water that lasts four to eleven weeks for breeding. This species' habitat consists of open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, coastal sage scrub, chaparral, sandy washes, and foothills. There were no permanent pools observed in the BSA during surveys which would allow for sustained breeding habitat.	Since there is no sustained breeding habitat onsite due to the absence of permanent pools, the onsite uplands are not expected to provide potential sustained estivation habitat.	Unlikely to occur in all habitats.

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Probability To Occur Within the Project Site and Fuel Modification Area	Probability To Occur Within the Pipeline Buffer
Reptiles						
Aspidoscelis hyperythra	Orange-throated whiptail	None	WL	There is one recorded observation of several adults less than 0.1 mile from the Project site from 2005 (CDFW 2023a). Additional observations have been recorded at Siphon reservoir, approximately 0.5 mile south of the proposed pipeline route from 1990 (CDFW 2023a). This species' habitat consists of semi-arid brushy areas with loose soil and rocks, in rocky hillsides, and coastal chaparral and scrub habitats. There are records of this species near the BSA.	High in area of sagebrush scrub and oak habitat.	High in undisturbed sagebrush scrub. Unlikely to occur elsewhere.
Crotalus ruber	Red-diamond rattlesnake	None	SSC	The nearest recorded observation for red-diamond rattlesnake is 2 miles northeast of the Project site. One individual was captured during a pitfall trap study in Limestone Canyon Regional Park in 1999. The extension of the landfill since its initial construction in 1990 has further fragmented the previously available natural habitat for this species surrounding the BSA. Reptiles are relatively fossorial species which spend periods of the year underground until suitable temperatures rebound and prey are accessible. These conditions can lead to low population counts and recorded observations. This species' habitat consists of arid scrub, coastal chaparral, oak and pine woodlands, and rocky grassland.	Medium in area of sagebrush scrub and oak habitat.	Medium in undisturbed sagebrush scrub. Unlikely to occur elsewhere.

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Probability To Occur Within the Project Site and Fuel Modification Area	Probability To Occur Within the Pipeline Buffer
Phrynosoma blainvillii	Coast horned lizard	None	SSC	The nearest recorded observation of coast horned lizard is 2 miles northeast of the Project site. A total of 43 individuals were captured during a pitfall trap study in Limestone Canyon Regional Park in 1999 (CDFW 2023a). This species requires open habitat with loose soils for burial and an abundant supply of ants or other insects. The conditions onsite consist of dense vegetation coverage which is incompatible with the habitat needs of coast horned lizard.	Low in all habitats.	Low in all habitats.
Salvadora hexalepis virgultea	Coast patch-nosed snake	None	SSC	The nearest recorded observation for coast patch-nosed snake is 2 miles northeast of the Project site. Two individuals were captured during a pitfall trap study in Limestone Canyon Regional Park in 1999. The extension of the landfill since its initial construction in 1990 has further fragmented the previously available natural habitat for this species surrounding the BSA. Reptiles are relatively fossorial species which spend periods of the year underground until suitable temperatures rebound and prey are accessible. These conditions can lead to low population counts and recorded observations.	Medium in area of sagebrush scrub and oak habitat.	Medium in undisturbed sagebrush scrub. Unlikely to occur elsewhere.

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Probability To Occur Within the Project Site and Fuel Modification Area	Probability To Occur Within the Pipeline Buffer
Birds						
Campylorhynchus brunneicapillus sandiegensis	Coastal cactus wren	None	SSC	The nearest recorded observation for this species in the CNDDB is 0.6 mile west of the Project site in 1990; this locality did not include records of nesting (CDFW 2023a). Cactus wren has also been found in the vicinity of the Project site within the larger Bowerman Landfill in 1995, 2002, 2003, and 2005; the nearest record is approximately 1,250 feet away from 2003 (County of Orange Integrated Waste Management Department 2006). It is a resident of the coastal sage scrub plant community but is closely associated with three species of cacti and occurs in thickets of cholla and coast prickly pear dominated stands of coastal sage scrub (County of Orange Integrated Waste Management Department 2006). Coast prickly pear were observed onsite in low numbers during the survey but not in thickets or stands or at or above 20 percent relative cover which could provide nesting habitat for this species.	Suitable nesting habitat for this species is not present.	Suitable nesting habitat for this species is not present.
Icteria virens	Yellow-breasted chat	None	SSC	The nearest recorded observation for this species is 1.5 miles southeast from the Project site; two pairs were observed in a nearby park, but no nests observed (CDFW 2023a). This species prefers riparian habitats with a well-developed shrub layer and an open canopy. Nesting habitat is typically limited to the margin of streams, creeks, sloughs, and rivers.	Suitable habitat requirements for this species are not present.	Suitable habitat requirements for this species are not present.

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Probability To Occur Within the Project Site and Fuel Modification Area	Probability To Occur Within the Pipeline Buffer
Polioptila californica californica	Coastal California gnatcatcher	Threatened	SSC	The nearest recorded observation for this species is along the western boundary of the Project site and southern boundary of the proposed pipeline route (CDFW 2023a). Additional observations of nesting have been recorded at the Siphon Reservoir, which is 1.5 miles west of the Project site and 0.5 miles south of the proposed pipeline route where successful nesting has been documented up to 2015 (CDFW 2023a). Foraging habitat for this species consists of California buckwheat, California sagebrush, and cacti. General habitat preferences consist of coastal sage scrub habitat in arid washes, on mesas, and on slopes of coastal hills.	Medium in area of sagebrush scrub.	Medium in undisturbed sagebrush scrub. Unlikely to occur elsewhere.
Vireo bellii pusillus	Least Bell's vireo	Endangered	Endangered	The Siphon Reservoir provides habitat for least Bell's vireo individuals found within the vicinity of the Project site; one successful nest was documented at this location in 2001 (CDFW 2023a). This species prefers low-elevation riparian habitat in proximity to water or in dry river bottoms. They nest along the margins of bushes or on twigs, usually in willows (*Salix* sp.), coyote brush (*Baccharis* sp.), or mesquite (*Prosopis* sp.).	Suitable habitat requirements for this species are not present.	Suitable habitat requirements for this species are not present.

Federally-listed endangered: an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.
Federally-listed threatened: an animal or plant in danger of becoming endangered within the foreseeable future throughout all or a significant portion of its range.
State-listed threatened: "threatened species" means a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts (Fish and Game Code § 2067).
SSC = CDFW Species of Special Concern: “Species of Special Concern” means a species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following criteria:

- Is extirpated from California or, in the case of birds, is extirpated in its primary season or breeding role;
- Is federally listed, but not state listed, as threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed;
- Is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for state threatened or endangered status; and/or
- Has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status.

WL = CDFW Watch List: animal taxa that were previously designated as SSC but no longer merit that status, or which do not yet meet SSC criteria, but for which there is concern and a need for additional information to clarify status.
Tracked by CDFW: species tracked by CDFW but that do not have a designated federal or state status.
CRPR = California Rare Plant Rank:

1B = Plants rare, threatened, or endangered in California and elsewhere.
2B = Plants rare, threatened, or endangered in California but more common elsewhere.
0.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat).
0.2 = Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat).

6.0 CONCLUSION AND RECOMMENDATIONS

The recommendations within this report are preliminary and will be refined during the California Environmental Quality Act (CEQA) process as more details about the Project design and schedule are determined. The Project falls under the Central Coastal Subregional NCCP/HCP as the Bowerman Landfill is in the Central Subregion area of the NCCP Reserve. Projects within the NCCP must comply with its requirements, including Construction Minimization Measures, pre-construction surveys, and associated mitigation plans if covered species are detected. The NCCP/HCP provides Incidental Take coverage related to permitted uses within the Reserve system.

One rare plant species, intermediate mariposa lily (CRPR 1B.2), was found on the Project site during the surveys. CRPR 1B.2 applies to species that are rare, threatened, or endangered in California and elsewhere, and are fairly threatened in California. It is recommended that Project impacts avoid the onsite populations of this species to the maximum extent feasible. While intermediate mariposa lily is not federally or state listed, impacts to this species must be evaluated in the CEQA document due to its designation as a CRPR 1B.2 rare plant species and as a Conditionally Covered Species under the NCCP/HCP. Per requirements in the NCCP/HCP, if less than 20 individuals of intermediate mariposa lily are observed in the impact area, no mitigation would be required. If more than 20 individuals are observed, mitigation will be required. During the 2023 surveys, 19 individuals were observed in the BSA (17 individuals within the proposed Project site, and 2 individuals outside of the proposed Project site but near the Fuel Modification Area). No individuals were found in the Fuel Modification Area. The following preliminary mitigation measures are recommended for this species:

- To address potential Project impacts to intermediate mariposa lily, an in-lieu fee shall be paid via minor amendment to the NCCP/HCP, as approved by USFWS and CDFW. The in-lieu fee will contribute to a management and monitoring program for rare plants in the Nature Reserve of Orange County.
- Silt fencing or flagging shall be installed under the guidance of a biological monitor along the limits of coastal sage scrub areas that are immediately outside of the grading/impact limits. The silt fencing/flagging shall be used to minimize impacts to sensitive natural resources including special-status plant species and native plant communities outside and immediately adjacent to the grading limits. Construction activities and personnel will be restricted within these adjacent coastal sage scrub areas and a biological monitor will be present during the silt fence/flagging installation and removal.

The Project as currently designed will impact 2.9 acres of sagebrush scrub in the Project site and Fuel Modification Area, potential habitat for coastal California gnatcatcher, coastal cactus wren, and orange-throated whiptail. Such impacts shall be mitigated through OCWR's participation and contribution in the Central Coastal NCCP/HCP. Specifically, the coastal California gnatcatcher, coastal cactus wren, and orange-throated whiptail are Target Species for which the NCCP/HCP has allocated a total of 206 acres of authorized coastal sage scrub take to occur within the Bowerman Landfill boundary after amendments to the EIR and NCCP/HCP. There is 38.74 acres of remaining take for future landfill development phases, including Phase IX and X. The area of impact for this proposed Project is located entirely within Phase X of the Landfill Development, which is projected to impact

25.41 acres of coastal sage scrub habitat. Therefore, the 2.9 acres of proposed impacts to coastal sage scrub from this Project shall be mitigated by debiting OCWR's available take credit.

In addition, the following Construction Minimization Measures required by the NCCP/HCP shall be followed:

- Impacts to coastal sage scrub habitat shall occur outside the breeding and nesting season of the coastal California gnatcatcher (February 15 through July 15) to the extent practicable.
- A pre-construction survey shall be conducted within the Project site and Fuel Modification Area to determine the presence/absence of coastal California gnatcatcher and coastal cactus wren prior to clearing or grading activities. The survey shall include a 100-foot buffer around the grading limits. Any coastal California gnatcatcher or coastal cactus wren observations shall be recorded and marked on the construction/grading plans.
- All coastal sage scrub habitat outside of the Project impact area shall be fenced or marked with materials prior to the commencement of grading. No construction access, parking, or storage of equipment or materials shall be allowed within these areas.
- A qualified biologist shall conduct and document a pre-construction meeting to educate construction staff (including supervisors, equipment operators, and other site employees) on the conservation measures required for the Project.
- A qualified biologist shall monitor the clearing of coastal sage scrub and oak woodland. USFWS/CDFW shall be notified at least 7 calendar days (preferably 14 calendar days) prior to disturbing habitat occupied by Target/Identified Species, if observed. The qualified biologist shall ensure that clearing activities and earth-moving equipment do not harm coastal California gnatcatchers or coastal cactus wren. The biologist shall also ensure that these activities do not harm other species that may occur, including western spadefoot, orange-throated whiptail, red-diamond rattlesnake, and coast patch-nosed snake.
- The access road shall be sprayed with water on occasion to reduce dust accumulation on the leaves of coastal sage scrub species, as overseen by the biological monitor.

Development activities that are addressed by the NCCP/HCP are considered fully mitigated under the NCCP Act and state and federal Endangered Species Acts for impacts to habitat occupied by listed species, NCCP Target Species, and other NCCP "Identified Species" and to "covered habitats" that these species are dependent upon or associated with. Species that have potential to occur in the BSA that qualify as NCCP Target Species or Identified Species include coastal California gnatcatcher, coastal cactus wren, orange-throated whiptail, red-diamond rattlesnake, western spadefoot, and other nesting birds and common wildlife species. Adhering to the requirements of the NCCP policies and procedures ensures no further mitigation is necessary.

Raptors and other birds have the potential to nest in the BSA and surrounding areas. For example, mature trees that could support nesting passerines and raptors were found in the areas mapped as coast live oak in the Project site and Fuel Modification Area and eucalyptus along the proposed

pipeline route (Figure 4). All vegetated areas of the BSA have the potential to support nesting birds. To protect raptors and other nesting birds, the following measures are recommended:

- Avoid ground-disturbing and vegetation removal activities during the nesting bird season (February 15 to September 15). If these activities must occur during the nesting season, a pre-construction nesting bird survey shall be conducted by a qualified biologist on and within 300 feet of the Project construction area. The survey shall be conducted no more than 10 days prior to initiation of ground-disturbance, vegetation clearing, or construction activities and shall be repeated between Project delays of greater than 10 days during the nesting season.
- If an active nest is found, an appropriate no-disturbance buffer for the species shall be visibly established in the field by a qualified biologist (e.g., flagging, staking, caution tape). No ground-disturbing or vegetation removal activities shall occur within the buffer until the nesting season has ended or the nest is vacated and juveniles have fledged, as determined by the qualified biologist. At the discretion of a qualified biologist, limited encroachment into the buffer may occur for non-listed bird species but no disturbance of active nests or nesting activities is allowed per the Migratory Bird Treaty Act.

Recommendations regarding jurisdictional areas are described in the jurisdictional delineation report (Tetra Tech 2024).

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APPENDIX A: PHOTOGRAPHS

Photograph 1 **Location:** Project site **Notes:** Coast live oak habitat.	
Photograph 2 **Location:** Project site **Notes:** Sagebrush scrub habitat.	

Photograph 3 **Location:** Project site **Notes:** The concrete channel at the toe of the slope.	
Photograph 4 **Location:** Proposed Pipeline Route **Notes:** Bee Canyon Access Road and structures associated with the landfill.	

Photograph 5	
Location: Proposed Pipeline Route	
Notes: Vegetated pad within a disturbed area.	
Photograph 6	
Location: Proposed Pipeline Route	
Notes: Sagebrush scrub habitat along Bee Canyon Access Road.	

Photograph 7 **Location:** Proposed Pipeline Route **Notes:** Eucalyptus grove habitat alongside Bee Canyon Access Road.	
Photograph 9 **Location:** Project site **Notes:** An intermediate mariposa lily found on the Project site.	

Photograph 10	
Location: Project site	
Notes: Representative photo of the intermediate mariposa lily habitat on the Project site.	

WETLANDS DELINEATION REPORT

Bowerman Power Renewable Natural Gas Plant
Frank R. Bowerman Landfill
Orange County, CA

August 2023

Prepared by

TETRA TECH

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EXECUTIVE SUMMARY

On behalf of Bowerman Power LFG, LLC ("Bowerman Power") (Bowerman Power, Project Proponent), Tetra Tech has prepared this Wetlands Delineation Report for the proposed Renewable Natural Gas (RNG) Plant planned at the Frank R. Bowerman Landfill (Bowerman Landfill) in Orange County, California (Project). This Report describes the literature review, survey methodology, and results of the wetlands delineation conducted for the Project. This Project is being conducted under a partnership agreement between Bowerman Power and OC Waste & Recycling (OCWR) to process the landfill gas produced by the Bowerman Landfill and deliver it to Southern California Gas Company (SoCal Gas).

A wetlands delineation was performed to assess potential jurisdictional waters and wetland features within the Project survey area. Three features under U.S. Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB) jurisdiction were identified in the survey area. Four areas under California Department of Fish and Wildlife (CDFW) jurisdiction were also identified in the survey area. Portions of each feature overlap with the proposed Project site (i.e., RNG Plant footprint). Avoidance or minimization of impacts to areas under the jurisdiction of the USACE, RWQCB, and CDFW is recommended. Coordination with these agencies is recommended to determine if the previously obtained permits still apply or if a modification or new permits are required, including a Section 404 permit from the USACE, a Water Quality Certification from the RWQCB, and a Lake and Streambed Alteration Agreement from the CDFW (County of Orange Integrated Waste Management Department 2006). The previously permitted or new jurisdictional features that occur in the survey area are as follows:

- Feature 1 – previously permitted from USACE and RWQCB, CDFW area is new.
- Feature 2 – not permitted.
- Feature 3 – not permitted.
- Feature 4 – previously permitted from USACE and RWQCB, CDFW area is new.

This Report is subject to verification by the USACE, RWQCB, and CDFW.

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Acronyms and Abbreviations

Bowerman Landfill	Frank R. Bowerman Landfill
Bowerman Power	Bowerman Power LFG, LLC
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
LFGTE	Landfill Gas to Energy
LSAA	Lake and Streambed Alteration Agreement
NWI	National Wetlands Inventory
OBL	Obligate Wetland
OCWR	OC Waste & Recycling
OHWM	ordinary high water mark
Porter-Cologne Act	Porter-Cologne Water Quality Control Act of 1969
Procedures	State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State
RNG	Renewable Natural Gas
RWQCB	Regional Water Quality Control Board
SoCal Gas	Southern California Gas Company
SWRCB	State Water Resources Control Board
UPL	Upland
USACE	U.S. Army Corps of Engineers
USDA NRCS	U.S. Department of Agriculture National Resources Conservation Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDRs	waste discharge requirements

1.0 INTRODUCTION

Tetra Tech has prepared this Wetlands Delineation Report (Report) for the proposed Renewable Natural Gas (RNG) Plant planned at the Frank R. Bowerman Landfill (Bowerman Landfill) in Orange County, California (Project). This Project is being conducted under a partnership agreement between Bowerman Power LFG, LLC (Bowerman Power) and OC Waste & Recycling (OCWR) to process the landfill gas produced by the Bowerman Landfill and deliver it to Southern California Gas Company (SoCal Gas).

The purpose of this Wetlands Delineation Report is to:

- Summarize the major applicable federal and state laws that apply to protecting jurisdictional wetlands, waters, and water quality.
- Document the methods and results of the wetlands delineation conducted for the Project.
- Identify jurisdictional areas under the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) criteria.

1.1 Project Location

The proposed Project is located at Bowerman Landfill in Orange County, California and consists of a proposed RNG Plant footprint (i.e., Project site) and proposed pipeline route (Figure 1). The Project site is generally bound by Bee Canyon Access Road to the north and northeast, the existing Landfill Gas to Energy (LFGTE) plant and flare station to the west, and open space and roads to the south (Figure 2). The proposed pipeline route connecting the proposed RNG Plant to the SoCal Gas interconnection goes north and west along Bee Canyon Access Road until the intersection of Jeffrey Road and Portola Parkway (Figure 1). The site is located within the U.S. Geological Survey (USGS) *El Toro* 7.5-Minute Topographic Quadrangle Map (Figure 3). Surrounding land uses consist of other areas of the Bowerman Landfill, open space, agricultural use, residential uses, and highways and roads.

The survey area for the wetlands delineation is shown in the figures, which approximates the Project Lease Boundary. The Project site consists of the proposed RNG footprint. The pipeline route was not surveyed for wetlands since construction would only occur within the existing roadway.

1.2 Environmental Setting

One unnamed ephemeral/intermittent stream runs through the survey area and ultimately leads off-site into Bee Canyon Wash, San Diego Creek, and then the Pacific Ocean (Figures 1 to 3). The data shown in Figures 1 to 3 is based on USGS blue-line streams, which are defined as perennial or ephemeral flowing waters. As described in the results section below, the waters that occur within the survey area were investigated during Tetra Tech surveys. A majority of the survey area is very steep hillside terrain and elevation ranges from approximately 690 to 800 feet above sea level. The survey area is undeveloped and vegetation throughout the survey area is a mixture of sagebrush scrub and coast live oak. Rainfall in 2023 has been higher than normal. From July 1, 2022 through June 30, 2023, rainfall for the Irvine area was estimated to be about 163 percent of normal (Golden Gate Weather Services 2023).

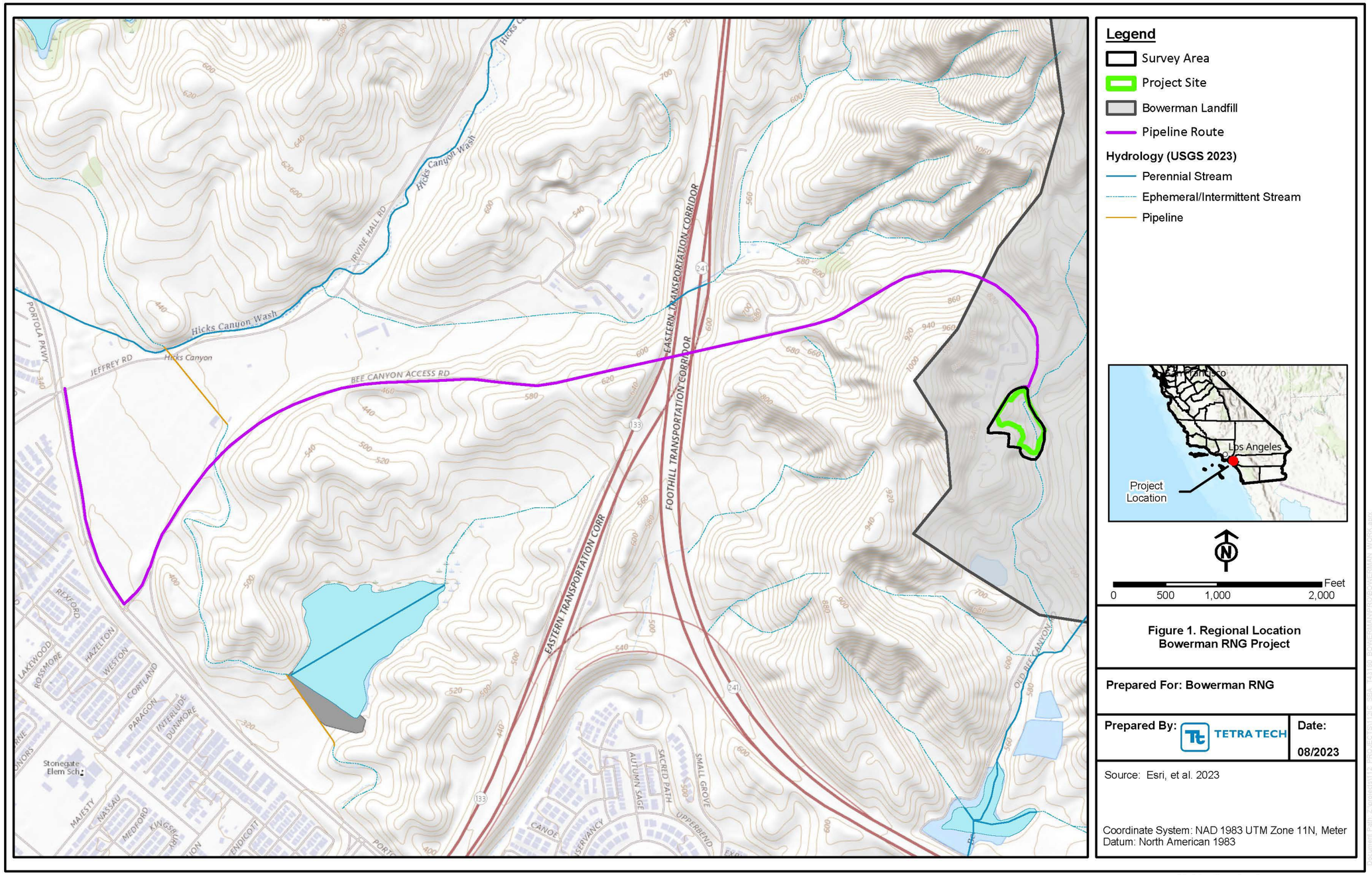


Figure 1. Regional Location
Bowerman RNG Project

Prepared For: Bowerman RNG

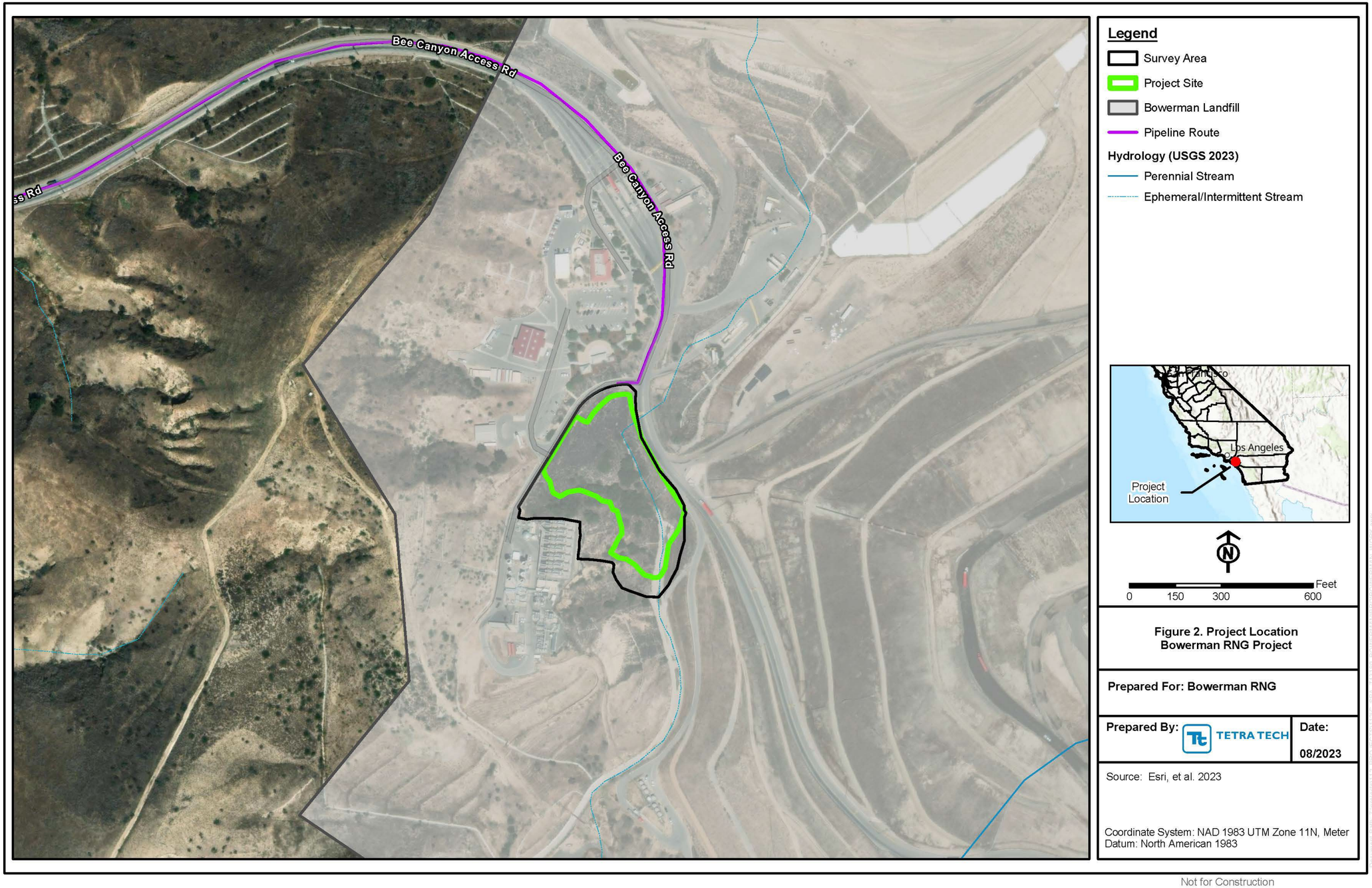
Prepared By: TETRA TECH

Date: 08/2023

Source: Esri, et al. 2023

Coordinate System: NAD 1983 UTM Zone 11N, Meter
Datum: North American 1983

Not for Construction



Not for Construction

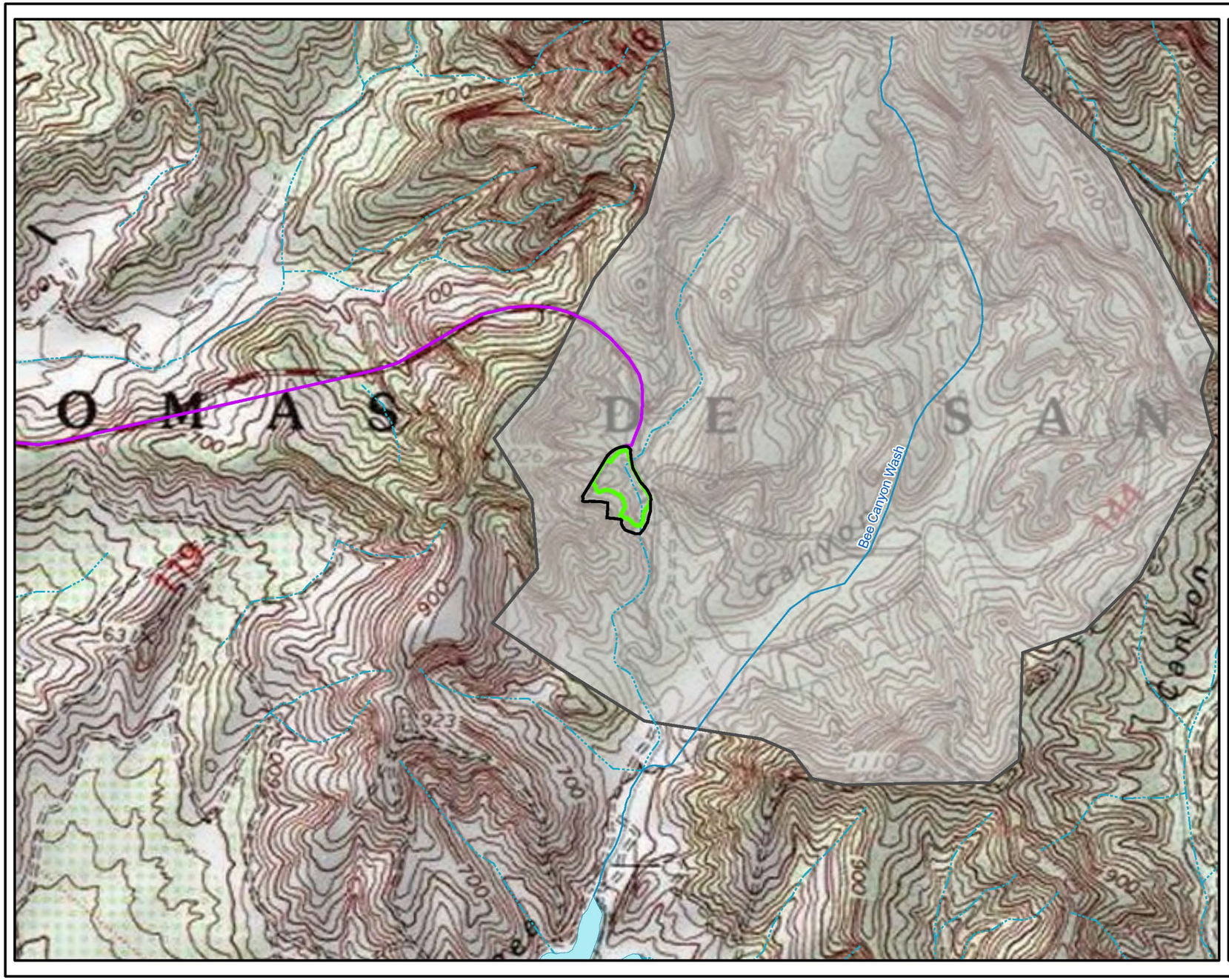


Figure 3. USGS Topographic Map
Bowerman RNG Project

Prepared For: Bowerman RNG

Prepared By: TETRA TECH **Date:** 08/2023

Source: Esri, et al. 2023

Coordinate System: NAD 1983 UTM Zone 11N, Meter
Datum: North American 1983

Not for Construction

2.0 REGULATORY OVERVIEW AND DEFINITIONS

2.1 U.S. Army Corps of Engineers

Section 404 of the Clean Water Act provides the U.S. Environmental Protection Agency (EPA) and the USACE regulatory and permitting authority over activities that result in the discharge of dredged or fill material into "navigable Waters of the U.S." Section 502(7) of the Clean Water Act defines navigable waters as "Waters of the U.S., including territorial seas." Section 328 of Chapter 33 in the Code of Federal Regulations (CFR) defines the term Waters of the U.S. as it applies to the jurisdictional limits of the authority of the USACE under the Clean Water Act. A summary of this definition of Waters of the U.S. in 33 CFR Section 328.3 includes (1) waters which are: (i) currently used, or were used in the past, or may be susceptible to use in commerce, including all waters which are subject to tides; (ii) the territorial seas; or (iii) interstate waters, including interstate wetlands; (2) impoundments of waters; (3) tributaries of waters; (4) wetlands adjacent to waters; (5) intrastate lakes and ponds, streams, or wetlands (USACE and EPA 2023). Therefore, for the purpose of determining USACE jurisdiction under the Clean Water Act, "navigable waters" as defined in the Clean Water Act are the same as Waters of the U.S. defined in the CFR above.

The limits of USACE jurisdiction under Section 404 as defined in 33 CFR Section 328.4 are as follows: (a) Territorial seas: three nautical miles in a seaward direction from the baseline; (b) Tidal waters of the U.S.: high tide line or to the limit of adjacent non-tidal waters; (c) Non-tidal waters of the U.S.: ordinary high water mark (OHWM) or to the limit of adjacent wetlands, or when the water of the U.S. consists only of wetlands to the limit of the wetland.

2.1.1 Section 404 Jurisdictional Wetlands

The USACE has defined the term "wetlands" as follows (33 CFR 328.3):

> *Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

The three parameters that are used to determine the presence of wetlands are: (1) hydrophytic vegetation, (2) wetland hydrology, and (3) hydric soils. Evidence of a minimum of one positive wetland indicator from each of the three parameters must be found in order to make a positive wetland delineation (USACE 2008).

Wetland areas which do not have a surface or groundwater connection to, and are not adjacent to, navigable Waters of the U.S. may be considered isolated and not subject to USACE jurisdiction.

Vegetation

Hydrophytic vegetation is defined as areas where the frequency and duration of inundation or soil saturation exerts a controlling influence on the plant species present. Plant species are assigned wetland indicator status according to the probability of their occurrence in a wetland. More than fifty percent of the dominant plant species must have a wetland indicator status to meet the hydrophytic vegetation criterion. The USACE has published the *Arid West 2020 Regional Wetland Plant List*

(USACE 2020) which separates vascular plants into the following categories based on plant species frequency of occurrence in wetlands:

- Obligate Wetland (OBL). Occur almost always (estimated probability greater than 99 percent) under natural conditions in wetlands.
- Facultative Wetland (FACW). Usually occur in wetlands (estimated probability 67-99 percent), but occasionally found in non-wetlands.
- Facultative (FAC). Equally likely to occur in wetlands or non-wetlands (estimated probability 34–66 percent).
- Facultative Upland (FACU). Usually occur in non-wetlands (estimated probability 67–99 percent), but occasionally found in wetlands (estimated probability 1–33 percent).
- Obligate Upland (UPL). Occur almost always (estimated probability greater than 99 percent) under natural conditions in non-wetlands.

The USACE considers OBL, FACW, and FAC species to be indicators of a wetland. An area is considered to have hydrophytic vegetation when greater than 50 percent of the dominant species in each vegetative stratum (tree, shrub, and herb) fall within these categories. Any species not listed in the USACE wetland plant list is assumed to be an upland species, almost never occurring in wetlands.

A secondary hydrophytic vegetation identifier is a prevalence index of 3.0 or less. The prevalence index is a weighted-average wetland indicator status of all plant species at the sample point, where each indicator status category is given a numeric code (OBL=1, FACW=2, FAC=3, FACU=4, and UPL=5) and weighting is by abundance (percent cover). This method is a more comprehensive analysis of the hydrophytic status of the community than one based on just a few dominant species. The prevalence index is used as a supplement to determine whether hydrophytic vegetation is present on sites where indicators of hydric soil and wetland hydrology are present, but the vegetation initially fails the dominance test.

Hydrology

Wetland hydrology is inundation or soil saturation with a frequency and duration long enough to cause the development of hydric soils and vegetation communities dominated by hydrophytic vegetation. If direct observation of wetland hydrology is not possible (as in seasonal wetlands), or records of wetland hydrology are not available (such as stream gauges), assessment of wetland hydrology is frequently supported by indicators, such as watermarks, surface soil cracks, sediment deposits, or a high water table.

OHWM is a line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area.

Soils

Hydric soils are saturated or inundated for a sufficient duration during the growing season to develop anaerobic or reducing conditions that favor the growth and regeneration of hydrophytic vegetation.

Field indicators of wetland soils include sulfidic odor, observations of ponding, inundation or saturation, dark (low chroma) soil colors, bright mottles (concentrations of oxidized minerals such as iron), or gleying (reduced conditions indicated by a blue- or green-grey color). Additional supporting information includes documentation of soil as hydric or reference to wet conditions in the local soil survey, both of which must be verified in the field.

Field indicators for hydric soils are particularly difficult to observe in sandy soils, which are often recently deposited soils of floodplains. These soils usually lack sufficient fines (clay and silt) and organic material to allow use of color as a reliable indicator of hydric soil. Hydric soil indicators in sandy soils include accumulations of organic matter and organic pan (soil layer in which organic matter and aluminum accumulate where the top of the water table most often occurs).

2.1.2 Section 404 Jurisdictional Waters of the U.S.

In April 2020, the USACE and EPA published the Navigable Waters Protection Rule in the Federal Register, which became effective on June 22, 2020. Following a federal district court decision on August 30, 2021, the USACE and EPA halted implementation of the Navigable Waters Protection Rule and began interpreting Waters of the U.S. consistent with the "pre-2015" regulatory regime (USACE and EPA 2021). On December 7, 2021, the USACE and EPA announced a Proposed Rule, published in the Federal Register, to revise the definition of Waters of the U.S. to formalize the Supreme Court's decisions and put back into place the "pre-2015" definition of Waters of the U.S. (USACE and EPA 2021). The final Revised Definition of Waters of the United States rule was published in the Federal Register on January 18, 2023, and took effect on March 20, 2023 (USACE and EPA 2023). Although the Supreme Court reached a decision on May 25, 2023 (Sacket vs EPA), which found that only wetlands that are "indistinguishable" from adjacent jurisdictional waterbodies can be covered by the law, the implications of this decision on enforcement of the final rule are currently not determined. Therefore, the analysis in this Report is based on the final rule from March 2023. Under the final rule (33 CFR 328.3):

(a) **Waters of the United States** means:

(1) Waters which are:

(i) Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(ii) The territorial seas; or

(iii) Interstate waters, including interstate wetlands;

(2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;

(3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section:

(i) That are relatively permanent, standing or continuously flowing bodies of water; or

(ii) That either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section;

(4) Wetlands adjacent to the following waters:

(i) (i) Waters identified in paragraph (a)(1) of this section; or

(ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3)(i) of this section and with a continuous surface connection to those waters; or

(iii) Waters identified in paragraph (a)(2) or (3) of this section when the wetlands either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section;

(5) Intrastate lakes and ponds, streams, or wetlands not identified in paragraphs (a)(1) through (4) of this section:

(i) That are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3)(i) of this section; or

(ii) That either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section.

(c)(6) **Significantly affect** means a material influence on the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section. To determine whether waters, either alone or in combination with similarly situated waters in the region, have a material influence on the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section, the functions identified in paragraph (c)(6)(i) of this section will be assessed and the factors identified in paragraph (c)(6)(ii) of this section will be considered:

(i) Functions to be assessed:

(A) Contribution of flow;

(B) Trapping, transformation, filtering, and transport of materials (including nutrients, sediment, and other pollutants);

(C) Retention and attenuation of floodwaters and runoff;

(D) Modulation of temperature in waters identified in paragraph (a)(1) of this section; or

(E) Provision of habitat and food resources for aquatic species located in waters identified in paragraph (a)(1) of this section;

(ii) Factors to be considered:

(A) The distance from a water identified in paragraph (a)(1) of this section;

(B) Hydrologic factors, such as the frequency, duration, magnitude, timing, and rate of hydrologic connections, including shallow subsurface flow;

(C) The size, density, or number of waters that have been determined to be similarly situated;

(D) Landscape position and geomorphology; and

(E) Climatological variables such as temperature, rainfall, and snowpack.

2.1.3 Areas Exempt from Section 404 Jurisdiction

Under the final Revised Definition of Waters of the United States rule (33 CFR 328.3):

(b) The following are not "waters of the United States" even where they otherwise meet the terms of paragraphs (a)(2) through (5) of this section:

(1) Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the Clean Water Act;

(2) Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA;

(3) Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;

(4) Artificially irrigated areas that would revert to dry land if the irrigation ceased;

(5) Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;

(6) Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;

(7) Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and

(8) Swales and erosional features (e.g., gullies, small washes) characterized by low volume, infrequent, or short duration flow.

2.2 Regional Water Quality Control Board

The Dickey Water Pollution Act of 1949 and the Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act) established the State Water Resources Control Board (SWRCB) and nine RWQCBs in California. The SWRCB and each RWQCB regulate activities in Waters of the State which include Waters of the U.S. "Waters of the State" are defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." These may include intermittent or ephemeral waters as well as isolated waters. SWRCB/RWQCB jurisdiction extends to the OHWM for non-wetland Waters of the State, or for wetlands, to the limit of the wetland.

The SWRCB/RWQCB regulates the "discharge of waste," including discharges of fill and dredged material, into Waters of the State. All parties proposing to discharge waste that could affect Waters of the State must file a report of waste discharge with the appropriate RWQCB. The RWQCB will then respond to the report of waste discharge by issuing waste discharge requirements (WDRs) in a public hearing, or by waiving WDRs (with or without conditions) for that proposed discharge.

Pursuant to Section 401 of the Clean Water Act, the SWRCB/RWQCB established the State Water Quality Certification Program. This program issues certifications for projects which propose to discharge fill or dredged material into Waters of the State. Water Quality Certification is necessary for all projects that require a USACE Section 404 permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State. A Water Quality Certification issued by the SWRCB/RWQCB certifies that project activities will not violate water quality standards individually or cumulatively over the term of the action. A Water Quality Certification must be consistent with the requirements of the Federal Clean Water Act, the California Environmental Quality Act (CEQA), the California Endangered Species Act, and the Porter-Cologne Act.

If a proposed project, or portion of a proposed project, does not require a federal permit but does involve dredge or fill activities that may result in a discharge to Waters of the State, the RWQCB has the option to regulate the dredge and fill activity under its state authority in the form of WDRs or Certification of WDRs. In these cases, a Water Quality Certification is not necessary under Section 401 of the Clean Water Act because federal jurisdiction does not apply.

The SWRCB has adopted the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (Procedures), which became effective on May 28, 2020 (SWRCB 2019). The Procedures consist of the following four components: (1) a statewide wetland definition; (2) a framework for determining if a feature that meets the wetland definition is a Water of the State; (3) wetland delineation procedures; and (4) supplemental procedures for application submittal, and the review and approval of Water Quality Certifications, WDRs, and waivers of WDRs for dredge or fill activities, including the *State Supplemental Dredge or Fill Guidelines* (Appendix A of the Procedures).

The Procedures define an area as a wetland as follows: an area is a wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation. This definition does not affect the meaning of Waters of the State as it pertains to SWRCB/RWQCB jurisdiction pursuant to the Porter-Cologne Act, nor does it modify the current authorities of the SWRCB/RWQCB to protect water quality. In accordance with the Procedures, the wetland delineation method outlined by the USACE has been utilized to map wetlands and Waters of the State, which extend to the limit of the wetland or to the OHWM for non-wetland waters. Jurisdiction has been evaluated in the regulatory context of the RWQCB, who may regulate intermittent or ephemeral waters as well as isolated waters.

2.2.1 Waters of the State

The SWRCB Procedures consider natural wetlands, wetlands created by modification of surface Waters of the State, and areas that meet the current or historic definitions of Waters of the U.S., to be

Waters of the State (SWRCB 2019). In addition, the Procedures considers artificial wetlands (i.e., wetlands that result from human activity) that meet specific criteria to be Waters of the State (SWRCB 2019). The Procedures incorporate the established wetland delineation procedures set forth by the USACE (USACE 2008), which were used to map wetlands and Waters of the State. However, contrary to the USACE wetland definition, the State's wetland definition also protects non-vegetated wetlands. In addition, Waters of the State may also include intermittent or ephemeral waters as well as isolated waters that are not under federal jurisdiction.

2.2.2 Areas Exempt from State Jurisdiction

Areas exempt from SWRCB/RWQCB jurisdiction include all artificial wetlands that are less than 1 acre in size and do not satisfy the following criteria: (1) created by modification of a surface Water of the State; (2) approved by an agency as compensatory mitigation for impacts to other Waters of the State, except where the approving agency explicitly identifies the mitigation as being of limited duration; (3) specifically identified in a water quality control plan as a wetland or other Water of the State; or (4) resulted from historic human activity, is not subject to ongoing operation and maintenance, and has become a relatively permanent part of the natural landscape.

In addition, artificial wetlands greater than or equal to one acre in size are exempt from SWRCB/RWQCB jurisdiction if the artificial wetland was constructed, and is currently used and maintained, primarily for one or more of the following purposes: (1) industrial or municipal wastewater treatment or disposal; (2) settling of sediment; (3) detention, retention, infiltration, or treatment of stormwater runoff and other pollutants or runoff subject to regulation under a municipal, construction, or industrial stormwater permitting program; (4) treatment of surface waters; (5) agricultural crop irrigation or stock watering; (6) fire suppression; (7) industrial processing or cooling; (8) active surface mining – even if the site is managed for interim wetlands functions and values; (9) log storage; (10) treatment, storage, or distribution of recycled water; (11) maximizing groundwater recharge (this does not include wetlands that have incidental groundwater recharge benefits); or (12) fields flooded for rice growing.

2.3 California Department of Fish and Wildlife

The CDFW is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. Streams and lakes, as habitat for fish, wildlife, and native plant species, are subject to jurisdiction by CDFW under Sections 1600-1616 of the California Fish and Game Code. Section 1602 requires any person, state or local governmental agency, or public utility to notify CDFW before beginning any activity that will do one or more of the following: (1) substantially obstruct or divert the natural flow of a river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake. These regulated activities require a Section 1602 Lake and Streambed Alteration Agreement (LSAA) from CDFW. Removal of riparian vegetation also requires a LSAA.

The Fish and Game Code, Sections 1600-1616, regulates activities that would alter the flow, bed, banks, channel, or associated riparian areas of a river, stream, or lake. CDFW jurisdiction over lakes

and streams is to the top of bank, or edge of riparian vegetation as determined by edge of dripline, whichever is further (CDFW 1994).

2.4 Summary of Regulations and Jurisdiction Definitions

The jurisdiction of each agency (i.e., USACE, RWQCB, and CDFW) is summarized in Table 1 based on the information provided in the sections above. Key differences are highlighted in the table.

Table 1. USACE, RWQCB, and CDFW Jurisdiction

Agency (Regulation)	Jurisdiction Type	Jurisdiction Extent	Notes
USACE (Section 404 of Clean Water Act)	Wetlands, non-wetland Waters of the U.S.	Boundary of wetland, or OHWM for non-wetland Waters of the U.S.	The feature must be either relatively permanent or significantly affect specific Waters of the U.S. to be considered jurisdictional.
RWQCB (Section 401 of Clean Water Act)	Wetlands, non-wetland Waters of the State	Boundary of wetland, or OHWM for non-wetland Waters of the State	Jurisdiction includes ephemeral waters as well as isolated waters that may not be under USACE jurisdiction, significant affect is not required.
CDFW (Section 1600-1616 of Fish and Game Code)	River, stream, or lake	Top of bank or edge of riparian vegetation (whichever is further)	Requires bed, banks, and channel or riparian vegetation.

Notes:
CDFW: California Department of Fish and Wildlife
OHWM: Ordinary high water mark
RWQCB: Regional Water Quality Control Board
USACE: U.S. Army Corps of Engineers

3.0 METHODS

3.1 Literature Review

Prior to the field survey, a literature review was conducted to evaluate potential jurisdictional areas within the survey area. The USGS 7.5-Minute Topographic Map *El Toro* Quadrangle, aerial and historical imagery (Google Earth©), the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) database (USFWS 2023), the U.S. Department of Agriculture National Resources Conservation Service (USDA NRCS) Web Soil Survey (USDA NRCS 2023), and previous site-specific studies were reviewed.

3.2 Jurisdictional Waters and Wetlands Delineation

A jurisdictional waters and wetlands delineation was performed within the survey area on June 19-20, 2023. The delineation was conducted at any potential jurisdictional wetlands, Waters of the U.S. and State, and areas potentially under CDFW jurisdiction. The procedures described in the *Interim Regional Supplement to the Corps of Engineering Wetland Delineation Manual: Arid West Region* (USACE 2008) were used to identify wetlands and Waters of the U.S. in the survey area that are potentially subject to regulation under Section 404 of the Clean Water Act. The potential jurisdictional features were also examined for an OHWM. The USACE delineation methodology was also used to map potential Waters of the State that were evaluated for RWQCB jurisdiction. Areas of CDFW jurisdiction were determined by the presence of defined bed, banks, and channel, or presence of a lake or pool, and were measured to the top of bank or the edge of riparian vegetation.

Sample points were taken to determine areas of potential jurisdiction and were mapped in the field using a Global Positioning System receiver with sub-meter accuracy. Field indicators were examined, and wetland data reporting forms were used to record three parameters: hydrophytic vegetation, wetland hydrology, and hydric soils. Completed wetland determination data forms are provided in Appendix A. Photographs taken during the field survey are provided in Appendix B.

Plant species present and the presence or absence of hydrophytic vegetation was recorded. Hydrophytic vegetation was determined to be present if greater than 50 percent of the dominant species at the sample point were OBL, FACW, or FAC (USACE 2020). If the hydrophytic vegetation dominance test was not greater than 50 percent, then the prevalence index was conducted if both hydric soils and hydrology were met unless disturbed or problematic. If the prevalence index was less than or equal to 3.0 then the vegetation was considered hydrophytic. Soil pits were excavated to a depth of at least 14 inches when feasible to examine soils for evidence of hydric indicators or saturation at the sample points. Soil pit locations are synonymous with sample points. Hydric soils and wetland hydrology were determined based on the presence of one or more of the applicable indicators.

Sample points were collected in each potential jurisdictional feature and as needed at upland points to determine the extent of the feature. A sample point is considered to be within a USACE wetland if the area met all three wetland parameters. If one or more of these parameters was not met in a typical situation, the point was considered to not be within a USACE wetland. In atypical or problematic situations (i.e., when vegetation, soil, or hydrology indicators are absent due to recent human disturbance or natural causes), all three parameters are not required to be a USACE wetland.

4.0 RESULTS

4.1 Literature Review

The survey area contains one ephemeral/intermittent blue-line stream as shown in the USGS topographic map (Figure 3). Blue-line streams are shown as either broken or solid blue lines and are defined as flowing waters that are ephemeral (broken lines) or perennial (solid lines). Two NWI riverine features also occur in the survey area (USFWS 2023). Previous site-specific studies also found jurisdictional features within the survey area (LSA 2022; County of Orange Integrated Waste Management Department 2006). All potential features were assessed during the jurisdictional delineation.

Soils mapped by the U.S. Department of Agriculture National Resources Conservation Service at the sample locations are Calleguas clay loam (USDA NRCS 2023). This soil type has 50 to 75 percent slopes, is non-saline to very slightly saline, and is not considered hydric soil (USDA NRCS 2023). The presence of hydric soils was assessed during the jurisdictional delineation.

4.2 Jurisdictional Delineation

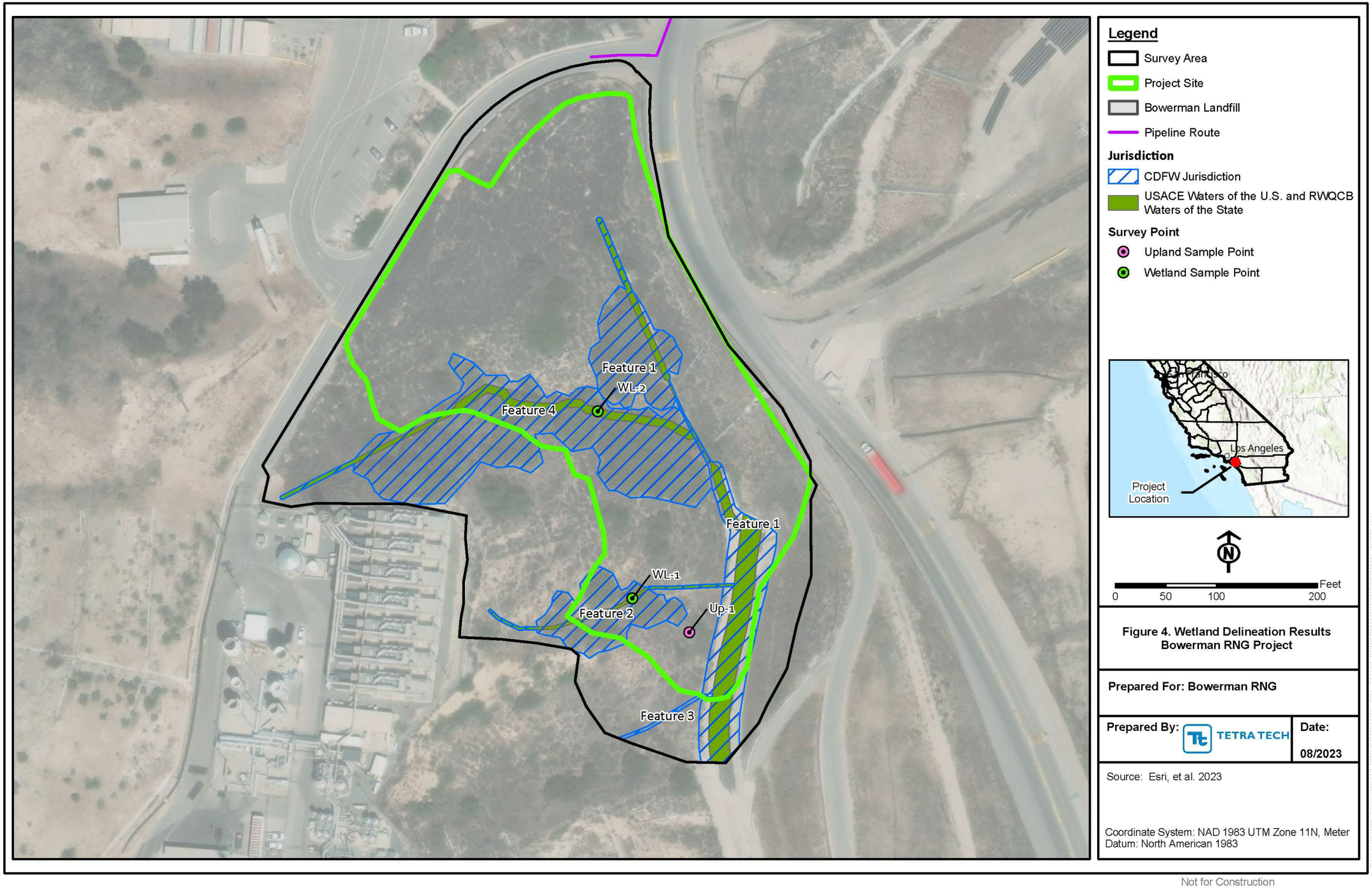
A total of four jurisdictional features were identified and mapped (Figure 4). These features were ephemeral soft- or hard-bottom (i.e., concrete) drainages. Areas of coast live oak (*Quercus agrifolia*) riparian vegetation was found around some of the features. A description of each feature is provided below. Saturated conditions and surface water were absent from the survey area besides one small portion of Feature 1, as described below. All features exhibited wetland hydrology but lacked hydric soils and hydrophytic vegetation. Results of the jurisdictional delineation conducted at these features are provided in Table 2.

Feature 1. This feature is a concrete channel that ranged in width from 2 to 40 feet. Banks were gradual to steep. In the southern portion, the wide banks of the concrete channel extended beyond the channel OHWM as shown in Figure 4. In addition, coast live oak riparian vegetation associated with this feature occurred adjacent to the channel in the northern portion. This feature was unvegetated but had portions with dense overhang of plant species that occur in sagebrush scrub and coast live oak habitats, such as coast live oak, mule fat (*Baccharis salicifolia*), California encelia (*Encelia californica*), California sagebrush (*Artemisia californica*), laurel sumac (*Malosma laurina*), and lemonade berry (*Rhus integrifolia*). Small areas of standing water were observed within this feature at a maximum of about 1 foot deep.

Feature 2. This feature is a concrete channel that transitions to soft-bottom in the central and western portions of the feature and was 3 feet wide. This feature drains water from the existing LFGTE plant to the concrete channel in the southern portion of the survey area. Banks were steep in the concrete channel and gradual in the soft-bottom area. Coast live oak riparian vegetation associated with this feature occurred adjacent to the soft-bottom channel in the central portion (Figure 4). The concrete channel was unvegetated and the soft-bottom area supported plant species that occur in sagebrush scrub and coast live oak habitats, such as coast live oak, California sagebrush, lemonade berry, and toyon (*Heteromeles arbutifolia*) as well as non-natives short podded mustard (*Hirschfeldia incana*), false brome (*Brachypodium distachyon*), and foxtail chess (*Bromus madritensis*). All areas of this feature were dry during the survey.

Feature 3. This feature is a concrete channel that was 3 feet wide. This feature continues outside the survey area to the west and likely drains water from the existing LFGTE plant to the concrete channel in the southern portion of the survey area. Banks were steep throughout. This feature was unvegetated but had overhang of sagebrush scrub plants, such as California sagebrush and non-native short podded mustard. All areas of this feature were dry during the survey.

Feature 4. This feature is a soft-bottom drainage that was 8 feet wide and transitions into a concrete channel that was 4 feet wide in the western portion of the feature (Figure 4). This feature drains water from the existing LFGTE plant to the concrete channel in the southern portion of the survey area. Banks were gradual in the soft-bottom area and steep in the concrete channel. Coast live oak riparian vegetation associated with this feature occurred throughout a majority of the feature and was dominated by coast live oak trees. All areas of this feature were dry during the survey.



Not for Construction

Table 2. Jurisdictional Delineation Results

Feature Number	Sample Point	Hydrophytic Vegetation	Hydric Soil	Wetland Hydrology	USACE Wetlands / Waters of the U.S.	RWQCB Waters of the State	CDFW Jurisdiction	Notes
1*	UP1	-	-	-	Yes	Yes	Yes	Concrete channel that ranged in width from 2-40 feet. In some portions the concrete banks extended beyond the channel OHWM. Coast live oak riparian vegetation occurred in the northern portion.
2	UP-1	-	-	-	Yes	Yes	Yes	Concrete channel and soft-bottom drainage that was 3 feet wide. Coast live oak riparian vegetation occurred in the central portion.
	WL-1	-	-	X				
3*	UP-1	-	-	-	No	No	Yes	Concrete channel that was 3 feet wide.
4	UP-1	-	-	-	Yes	Yes	Yes	Soft-bottom drainage (8 feet wide) and concrete channel (4 feet wide). Coast live oak riparian vegetation occurred throughout.
	WL-2	-	-	X				

Note: *Concrete-lined channels were mapped but sample points were not collected since soil pits cannot be dug.

"X" = indicator met; "-" = indicator not met.

No features met all three USACE wetland parameters required to be a wetland. However, three features within the survey area (Features 1, 2, and 4) are jurisdictional to the USACE since these features ultimately converge and connect into Bee Canyon Wash, which connects into San Diego Creek and then the Pacific Ocean. These features were determined to be USACE Waters of the U.S. since they significantly affect traditional navigable waters. One feature (Feature 3) was determined to be exempt from USACE jurisdiction since it is a ditch that drains only dry land. All areas determined to be Waters of the U.S. are also RWQCB Waters of the State. In addition, areas of CDFW jurisdiction were found, which includes all four features and the surrounding riparian vegetation in some areas.

Table 3 provides total acres of jurisdictional areas within the Project site, which includes the proposed RNG Plant footprint. Results of the delineation in the context of the USACE, RWQCB, and CDFW are discussed in Sections 4.2.1 to 4.2.3.

Table 3. Jurisdictional Areas

Feature Number	USACE Wetlands / Waters of the U.S. (acres) within Project Site	RWQCB Waters of the State (acres) within Project Site	CDFW Jurisdiction (acres) within Project Site
1	0.12	0.12	0.36
2	0.01	0.01	0.11
3	0	0	0.001
4	0.05	0.05	0.37
Total	**0.18**	**0.18**	**0.84**

4.2.1 U.S. Army Corps of Engineers

Section 404 Jurisdictional Wetlands

As shown in Table 2, no features met hydrophytic vegetation or hydric soil. Features 2 and 4 met wetland hydrology, which was in the form of water-stained leaves, drift deposits, and drainage patterns. Features 1 and 3 were concrete-lined and were unvegetated. Therefore, no features met all three wetland parameters required to be a USACE Wetland. In addition, no atypical or problematic situations were encountered. However, as discussed in the section below, three features (Features 1, 2, and 4) are jurisdictional to the USACE since they ultimately connect into and significantly affect traditional navigable waters, and Feature 3 is exempt.

Data on vegetation, hydrology, and soils collected at sample points for each feature during the jurisdictional delineation are provided on the USACE wetland determination data forms in Appendix A. All sample points are shown in Figure 4.

Section 404 Jurisdictional Waters of the U.S.

Features 1, 2, and 4 are jurisdictional channels that ultimately lead into the Pacific Ocean. Features 2 and 4 connect into Feature 1 on-site, which leads off-site to the south into Bee Canyon Wash. Bee Canyon Wash then connects into San Diego Creek and the Pacific Ocean. Therefore, these three features are considered tributaries to traditional navigable waters. These features are ephemeral and likely receive water only in response to rainfall and are not considered relatively permanent waters.

Relatively permanent waters either flow year-round or have continuous flow at least seasonally, which is typically quantified as three months. However, in combination with similarly situated waters in the region, these waters may significantly affect the chemical, physical, or biological integrity of traditional navigable waters since there is a hydrologic connection. These features may contribute flow; trap, transform, filter, or transport materials (e.g., nutrients, sediments, and other pollutants); and provide retention and attenuation of floodwaters and runoff into traditional navigable waters. These features may also provide habitat and food resources for aquatic species. Therefore, Features 1, 2, and 4 are Section 404 Waters of the U.S.

Areas Exempt from Section 404 Jurisdiction

Feature 3 was determined to be exempt from USACE Section 404 jurisdiction because it is considered a ditch excavated wholly in and draining only dry land, and does not carry a relatively permanent flow of water. Although Feature 2 is a similar concrete feature in the eastern portion, it connects through and drains a riparian area and is connected to other Waters of the U.S. as described above, and therefore is not exempt.

4.2.2 Regional Water Quality Control Board

Waters of the State

RWQCB Waters of the State include USACE Section 404 jurisdictional wetlands and Waters of the U.S. Therefore, Waters of the State were identified within the survey area at Features 1, 2, and 4 since these three features are considered Waters of the U.S. (Figure 4). Feature 3 is not a Waters of the U.S. or wetland and is therefore also not a Waters of the State.

Areas Exempt from State Jurisdiction

No features in the survey area were determined to be exempt from RWQCB jurisdiction.

4.2.3 California Department of Fish and Wildlife

Features 1 through 4 have defined bed, banks, and channel or are connected directly upstream or downstream to an area that does. In addition, coast live oak riparian vegetation was found surrounding potions of Features 1, 2, and 4 (Figure 4). The features as well as the adjacent riparian vegetation are under CDFW jurisdiction.

5.0 CONCLUSION

Three features under USACE and RWQCB jurisdiction were identified in the survey area, which includes Features 1, 2, and 4. These features and Feature 3 are under CDFW jurisdiction. Portions of each feature overlap with the proposed Project site. It is recommended that impacts are avoided to areas under the jurisdiction of the USACE, RWQCB, and CDFW. Coordination with these agencies is recommended to determine if the previously obtained permits still apply or if a modification or new permits are required, including a Section 404 permit from the USACE, a Water Quality Certification from the RWQCB, and a Lake and Streambed Alteration Agreement from the CDFW (County of Orange Integrated Waste Management Department 2006). The previously permitted or new jurisdictional features that occur in the survey area are as follows:

- Feature 1 – previously permitted from USACE and RWQCB, CDFW area is new.
- Feature 2 – not permitted.
- Feature 3 – not permitted.
- Feature 4 – previously permitted from USACE and RWQCB, CDFW area is new.

This Report is subject to verification by the USACE, RWQCB, and CDFW.

6.0 REFERENCES

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APPENDIX A: WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Bowerman RNG Project | City/County: Orange County | Sampling Date: 6/20/23

Applicant/Owner: Bowerman RNG | State: CA | Sampling Point: UP-1

Investigator(s): Berg | Section, Township, Range: T5 South, R8 West

Landform (hillslope, terrace, etc.): Upland hillslope | Local relief (concave, convex, none): None | Slope (%): 3

Subregion (LRR): C - Mediterranean California | Lat: 33.715941177 | Long: -117.709244930833 | Datum: WGS

Soil Map Unit Name: Calleguas clay loam, 50 to 75 percent slopes, eroded | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks: Shared upland sample point for all features.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Artemisia californica*	25	Yes	Not Listed
2. *Eriogonum fasciculatum*	5	No	Not Listed
3. *Acmispon glaber*	1	No	Not Listed
4. *Heteromeles arbutifolia*	1	No	Not Listed
5. *Opuntia littoralis*	1	No	Not Listed
Total Cover:	33 %		
Herb Stratum			
1. *Brachypodium disctachyon*	45	Yes	Not Listed
2. *Bromus madritensis*	45	Yes	UPL
3. *Hirschfeldia incana*	15	No	Not Listed
4.			
5.			
6.			
7.			
8.			
Total Cover:	105 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species	138	x 5 =	690
Column Totals:	138 (A)		690 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

- [●] Dominance Test is >50%
- [●] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks:

SOIL

Sampling Point: UP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-1								Organic debris (sticks, grass)
1-15	10YR 4/4	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Bowerman RNG Project | City/County: Orange County | Sampling Date: 6/20/23

Applicant/Owner: Bowerman RNG | State: CA | Sampling Point: WL-1

Investigator(s): Berg | Section, Township, Range: T5 South, R8 West

Landform (hillslope, terrace, etc.): Hillslope channel | Local relief (concave, convex, none): Concave | Slope (%): 15

Subregion (LRR): C - Mediterranean California | Lat: 33.71603155682665 | Long: -117.70943791864217 | Datum: WGS

Soil Map Unit Name: Calleguas clay loam, 50 to 75 percent slopes, eroded | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus agrifolia*	40	Yes	Not Listed
2.			
3.			
4.			
Total Cover:	40 %		
Sapling/Shrub Stratum			
1. *Malosma laurina*	1	Yes	Not Listed
2. *Artemisia californica*	1	Yes	Not Listed
3.			
4.			
5.			
Total Cover:	2 %		
Herb Stratum			
1. *Brachypodium disctachyon*	90	Yes	Not Listed
2. *Bromus madritensis*	10	No	UPL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species	142	x 5 =	710
Column Totals:	142 (A)		710 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

- [ ] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks:

SOIL

Sampling Point: WL-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-2								Leaf litter
2-16	10YR 4/3	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: Soil has many loose rocks and gravel fragments up to 8 inches in size.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☒ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Bowerman RNG Project | City/County: Orange County | Sampling Date: 6/20/23

Applicant/Owner: Bowerman RNG | State: CA | Sampling Point: WL-2

Investigator(s): Berg | Section, Township, Range: T5 South, R8 West

Landform (hillslope, terrace, etc.): Hillslope channel | Local relief (concave, convex, none): Concave | Slope (%): 15

Subregion (LRR): C - Mediterranean California | Lat: 33.7165406246667 | Long: -117.709548249 | Datum: WGS

Soil Map Unit Name: Calleguas clay loam, 50 to 75 percent slopes, eroded | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus agrifolia*	75	Yes	Not Listed
2.			
3.			
4.			
Total Cover:	75 %		
Sapling/Shrub Stratum			
1. *Rhus integrifolia*	5	Yes	Not Listed
2. *Heteromeles arbutifolia*	5	Yes	Not Listed
3. *Mimulus aurantiacus*	1	No	FACU
4.			
5.			
Total Cover:	11 %		
Herb Stratum			
1. *Bromus madridtensis*	1	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	1 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species	1	x 4 =	4
UPL species	86	x 5 =	430
Column Totals:	87 (A)		434 (B)

Prevalence Index = B/A = 4.99

Hydrophytic Vegetation Indicators:

- (●) Dominance Test is >50%
- (●) Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks: Ground cover is entirely leaf litter from oaks.

SOIL

Sampling Point: WL-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-3								Leaf litter
3-16	10YR 2/2	100					Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☒ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B: PHOTOGRAPHS

Photograph 1	
Location: Feature 1	
Notes: Overview of Feature 1.	

Photograph 2	
Location: Feature 1	
Notes: Overview of Feature 1.	

Photograph 3	
Location: Feature 2	
Notes: Overview of Feature 2 and Sample Point WL-1.	

Photograph 4	
Location: Feature 3	
Notes: Overview of Feature 3.	

Photograph 5	
Location: Feature 4	
Notes: Overview of Feature 4 and sample point WL-2.	

Photograph 6	
Location: Upland	
Notes: Sample Point UP-1.	

APPENDIX D: CULTURAL RESOURCES REPORT

Phase I Archaeological Survey Inventory Results for the Bowerman Power Renewable Natural Gas Plant Project Orange County, California

Prepared for:

OC Waste & Recycling
601 N. Ross Street, 5th Floor
Santa Ana, CA 92701

Prepared by:

Tetra Tech, Inc.
17885 Von Karman Ave. Suite 500
Irvine, CA 92614

Author:
Jenna Farrell, MA RPA, Principal Archaeologist

July 2024

MANAGEMENT SUMMARY

This technical report provides the non-confidential information included in the Phase I Archaeological Inventory Results for Bowerman Power LFG, LLC's (Bowerman Power) proposed Bowerman Power Renewable Natural Gas Plant Project (Project). Confidential archaeological and tribal cultural resource locational information has not been included in this report as it is restricted and confidential in order to prevent desecration, vandalism, artifact looting or hunting, and to protect landowners from trespass. The following laws protect such resources: California State Government Code Section 6254.10: Exempts archaeological sites from the California Public Records Act, making their locations confidential; Executive Order 13007: Restricts public access to archaeological and TCP locations; National Historic Preservation Act Section 304: Restricts public access to archaeological and Traditional Cultural Property (TCP) locations; Archaeological Resources Protection Act Section 9(a): Restricts public access to archaeological and TCP locations. In addition, Under California Assembly Bill 52 (AB 52), tribal information provided during consultation is considered confidential and cannot be publicly disclosed without the written consent of the tribe involved. To access confidential cultural resource information, one must meet the Secretary of the Interior Standards under Archaeology, History, or Architecture or have permission with the consulting Tribe.

The proposed Project is located at the Frank R. Bowerman Landfill at 11002 Bee Canyon Access Road in unincorporated Orange County, California, north and within the sphere of influence of the city of Irvine. The Project involves constructing a renewable natural gas plant (Project site) and a new SoCal Gas pipeline (Project pipeline route) connecting the processing plant to an existing SoCal Gas pipeline at the corner of Portola Parkway and Jeffrey Road. OC Waste & Recycling is the lead agency for the preparation of the California Environmental Quality Act environmental document for the proposed Project. The Phase I Archaeological Inventory included a Phase I record search, archaeological field survey, preliminary reporting, and this technical report.

A cultural resource records review through the California Historical Resources Information Center's South-Central Coastal Information Center, a Native American Heritage Commission Sacred Lands File search, and a pedestrian archaeological field survey (surface) was conducted for the proposed Project site and pipeline route. A Tetra Tech, Inc. archaeologist conducted a Phase I Archaeological Field Survey on September 26, 2023 and on March 7, 2024. The field survey resulted in the updating of three previously recorded archaeological sites.

Project Summary
County: Orange
USGS 7.5' quadrangle: El Toro
Owner: OCWR
Survey Type: Intensive Pedestrian Field Survey and Reconnaissance
Surveyed Acres: under 10 acres

Date of Survey: September 26, 2023, and March 7, 2024
Field Crew: Jenna Farrell, MA RPA (Principal Investigator), Astrid Molina, BA (Field Technician), Cris Crump, BA (Archaeological Field Technician)
Field Survey Results: Updated Previously Recorded Sites: All three sites are recommended not eligible to the California Register of Historical Resources.
Historical Resources within Project: None
Management Recommendations: Cultural Resource Environmental Training, Archaeological and Native American Monitoring, Monitoring and Inadvertent Discovery Plan

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ACRONYMS AND ABBREVIATIONS

Bowerman Power	Bowerman Power LFG, LLC (Project Proponent)
BP	before present
CEQA	California Environmental Quality Act
County	Orange County
CRHR	California Register of Historical Resources
FRB	Frank R. Bowerman
HDD	horizontal directional drilling
Lead Agency	OC Waste & Recycling
MLD	Most Likely Descendent
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
OCWR	OC Waste & Recycling
Plan	Monitoring and Inadvertent Discovery Plan
POR	Point of Receipt
PRC	Public Resource Code
Project	Bowerman Power Renewable Natural Gas Plant Project
RNG	renewable natural gas
scfm	standard cubic feet per minute
SLF	Sacred Lands File
SCCIC	South-Central Coastal Information Center
Tetra Tech	Tetra Tech, Inc.
USGS	U.S. Geological Survey

1.0 INTRODUCTION

This technical report provides the non-confidential information included in the Phase I Archaeological Inventory Results for Bowerman Power's proposed Bowerman Renewable Natural Gas Plant Project (Project). Bowerman Power is working with OC Waste & Recycling (OCWR) to develop a renewable natural gas (RNG) production plant (Plant) at the Frank R. Bowerman (FRB) Landfill, to be known as the Bowerman Power Renewable Natural Gas Plant Project (Project). The RNG Plant will be designed to produce RNG from landfill gas (LFG) that is produced by the FRB Landfill and deliver it to SoCal Gas.

This technical report provides the Phase I Archaeological Inventory Results for Bowerman Power's proposed Project. The lead agency is OCWR. This report was prepared to partially fulfill compliance with the California Environmental Quality Act (CEQA) and other applicable state regulations and policies.

The Phase I Archaeological Inventory included a Phase I record search, archaeological field survey, and preliminary reporting. This inventory was performed in coordination with Bowerman Power, OCWR, and interested tribes. This report was prepared under the guidelines of the Secretary of Interior Standards and Guidelines and the Office of Historic Preservation's Archeological Resource Management Reports (ARMR): A Draft Recommended Contents and Format (SHPO 1990).

1.1 PROJECT DESCRIPTION AND LOCATION

The proposed Project involves constructing a RNG Plant (Project site) and a new SoCal Gas pipeline (Project pipeline route) connecting the processing plant to an existing SoCal Gas pipeline at the corner of Portola Parkway and Jeffrey Road. See Figures 1-1 through 1-4 for project maps. OCWR is the lead agency for the preparation of the CEQA environmental document for the proposed Project.

Bowerman Power is working with OCWR to develop an RNG Plant at the FRB Landfill. The RNG Plant will be designed to process a portion of the excess LFG that has not been processed at the Bowerman Power Plant and would otherwise require incineration at the existing adjacent flare station and then deliver the processed RNG to SoCal Gas. The RNG Plant layout will comprise the process equipment area and the control and electric buildings.

The RNG Plant

The RNG Plant site involves 3.5 acres of part of the undeveloped land leased to Bowerman Power by OCWR. This land is adjacent to the existing 19.6-megawatt landfill gas to energy facility and flare station on land planned for the development of a future FRB Master Development Plan Landfill phase. The RNG Plant will be designed to process a maximum of 6,000 scfm of raw LFG at the inlet. The process will remove nitrogen, oxygen, carbon dioxide,

sulfur hydroxide, volatile organic chemicals, hydrogen sulfide, as well as other minor impurities to meet the gas specifications of SoCal Gas.

The approximately 3.5-acre Project site will require grading for the approximately 2.3-acre RNG Plant pad. The pad will be composed of approximately 1.38 acres concrete and 0.92 acre graded land. The pad is expected to require approximately 70,000 cubic yards of fill material, which will be extracted from an existing soil stockpile area within the FRB Landfill boundaries. The soil stockpile area was previously graded as part of FRB Landfill Master Development Plan development and is currently used as the soil stockpile area for the soils excavated as part of the Phase VIIIA development.

SoCalGas will develop a POR facility that will receive RNG from the plant, odorize, compress, and insert the RNG into its pipeline. A 250-gallon odorant tank will be installed in the POR facility. SoCal Gas will construct a new 12-inch-diameter pipeline to convey the RNG from the POR on the Project site to the existing SoCal Gas pipeline at the corner of Portola Parkway and Jeffrey Road (see Figures 1-2 through 1-4).

SoCal Gas Pipeline Construction

Construction of the new SoCal Gas pipeline route will take place along Bee Canyon Access Road and Portola Parkway (see Figures 1-2 through 1-4). The majority of the pipeline installation construction activities will use open-trench techniques within the paved sections of the roadways, with horizontal directional drilling techniques in some locations. The construction work area along the proposed pipelines will be approximately 50 feet wide. The disturbance for trenching activities will be approximately 30 inches wide with an average depth of 6 feet.

SoCalGas plans to perform a horizontal directional drilling (HDD) operation along Bee Canyon Access Road to install approximately 1,300 feet of 12.7-inch steel pipeline beneath the Highway 241 Transportation Corridor. The entry and exit workspaces will be located on private property outside of Caltrans Right of Way (see Figure 1-4, Sheets 4 and 5, and Figure 1-5). The HDD entry workspace will be approximately 150 feet x 100 feet in size and located within the “dirt lot” adjacent to the west-bound lane of Bee Canyon Access Road, approximately 600 feet northeast from the center of the “Bee Canyon Access Rd. Bridge” or Bridge #55-785. The HDD exit workspace will be approximately 150 feet x 60 feet in size and will be located along Bee Canyon Access Road, approximately 800 feet southwest from the center of the “Bee Canyon Access Rd. Bridge.” The maximum excavation depths for both the HDD entry and exit workspaces should not exceed 10 feet.

The HDD process can be divided into four main phases: pilot hole, reaming, swabbing, and pullback. The pilot hole will be approximately 10-inch in diameter and will drill a complete profile from entry to exit locations. During the reaming and swabbing phases, the pilot hole will be expanded to a minimum of 18 inches. The final hole size will be determined by the HDD contractor. Prior to the pullback phase, the steel pipeline will be hydrostatically tested and upon completion, will be pulled into the hole. A bentonite mixture will be placed downhole to solidify

and fill the void space and cap the ends of the entry and exit holes. The approved material will be determined by the drilling contractor and any permitting conditions. The specific construction approach for the crossing of the Highway 241 Transportation Corridor is preliminary and subject to change depending on permitting conditions and requirements.

Project Location

The Project site is generally bound by Bee Canyon Access Road to the north and northeast, the existing Bowerman Power Plant (a landfill gas to energy plant) and flare station to the west, and open space and roads to the south (Figure 1-2). The site is located within the U.S. Geological Survey (USGS) El Toro 7.5-Minute Topographic Quadrangle Map (Figure 1-3) and is not within the Public Land Survey System sections. The proposed north to west trending Project pipeline route connecting the proposed RNG Plant to the existing SoCal Gas interconnection is within the existing Bee Canyon Access Road. At the intersection of Bee Canyon Access Road and Portola Parkway, the Project pipeline route continues north within Portola Parkway Road and terminates at the intersection of Portola Parkway and Jeffrey Road (Figures 1-2 and 1-4). Surrounding land uses consist of other areas of the Frank R. Bowerman (FRB) Landfill, open space, residential uses, and highways and roads.

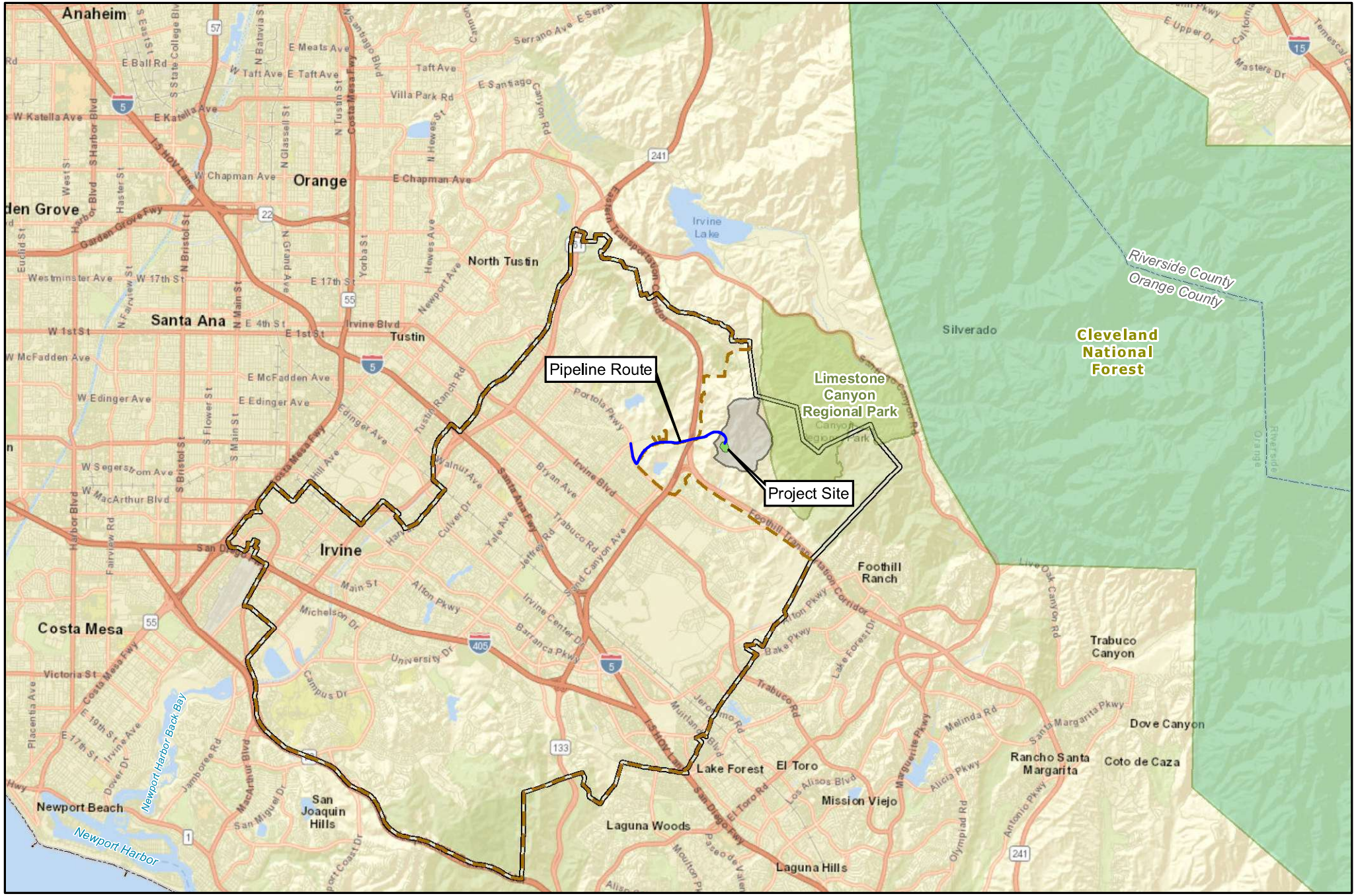


Figure 1-1
Project Vicinity

Bowerman Power RNG Plant Project
Orange County, CA

Project Lease Boundary
Pipeline Route
Project Site

Bowerman Landfill Soil Stockpile Area
Bowerman Landfill
HDD Location

Disturbed Area for Grading Replanted for Fire Fuel Modification
Fuel Modification Area
Temporary Disturbed Area for Trenching

N

0 500 1,000 Feet

NOT FOR CONSTRUCTION

Figure 1-2
Project RNG Plant Site and Borrow Area Locations (aerial)

Bowerman Power RNG Plant Project
Orange County, CA

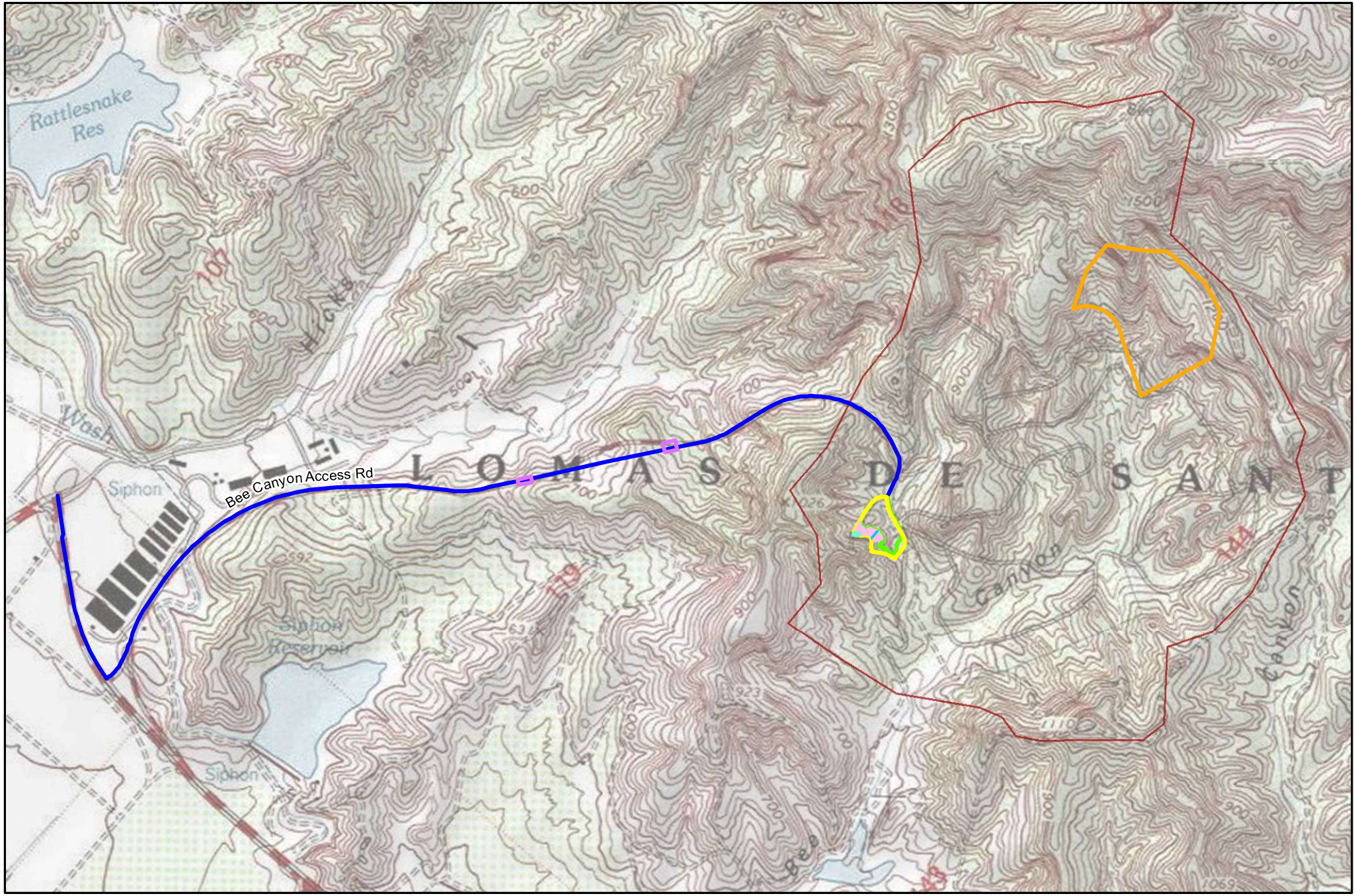
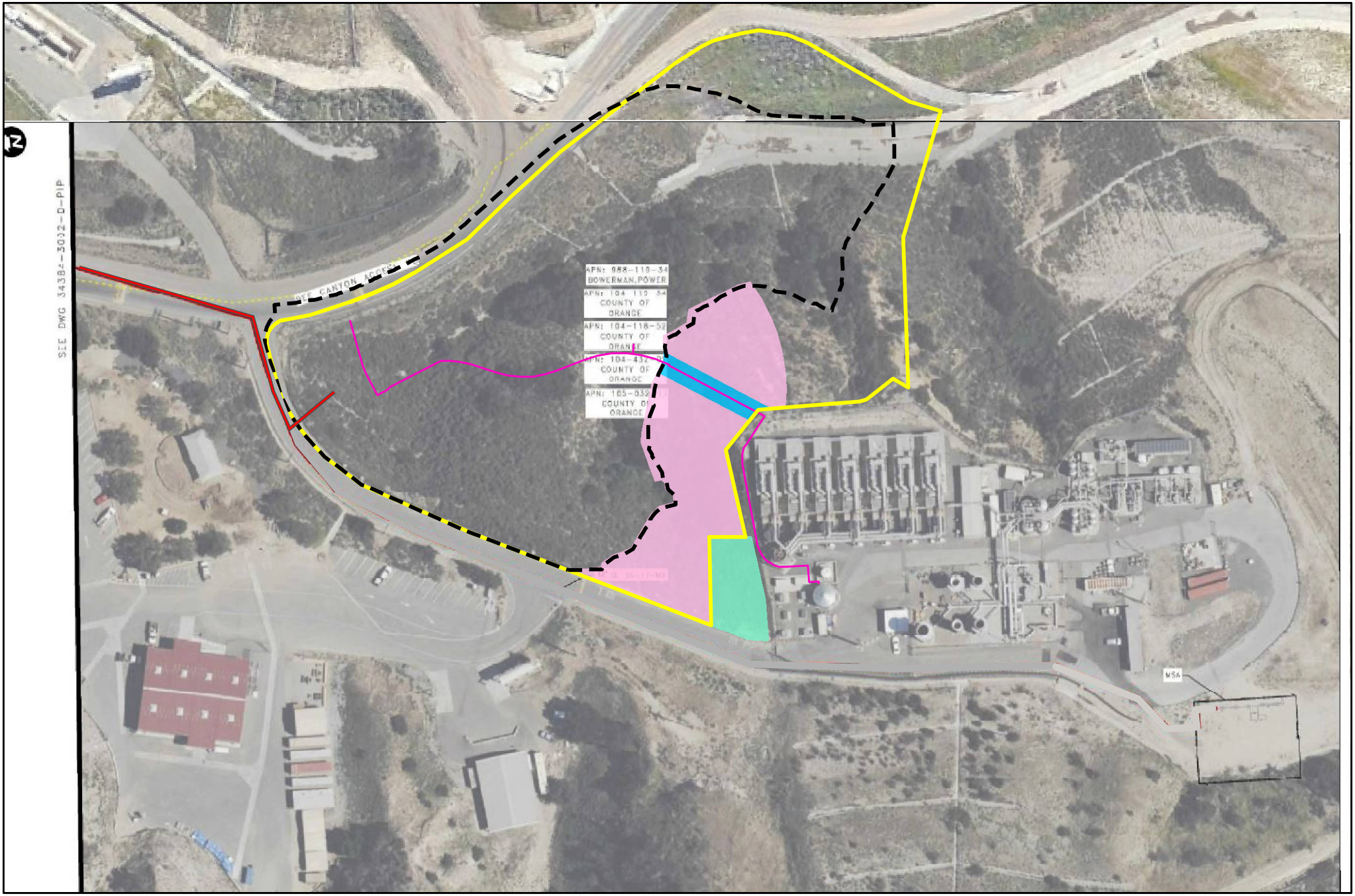


Figure 1-3
Project RNG Plant Site and
Borrow Area Locations (topographic)

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route

Project Lease Boundary

Project Site

NOT FOR CONSTRUCTION

Fire Water Line

Disturbed Area for Grading Replanted for Fire Fuel Modification

Fuel Modification Area

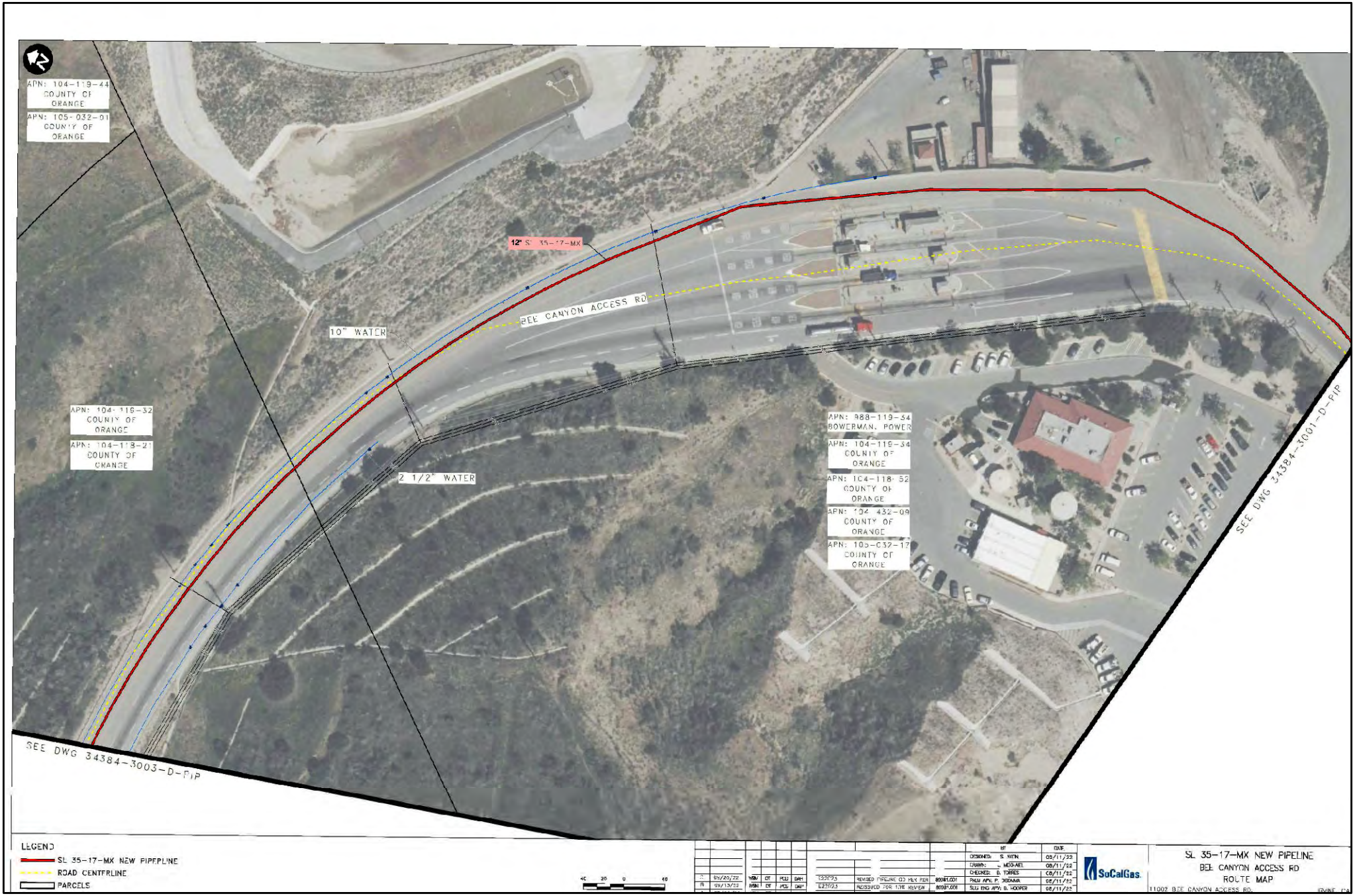
Temporary Disturbed Area for Trenching

N

0 25 50 100 Feet

Figure 1-4.1
Pipeline Route
Sheet 1 of 12

Bowerman Power RNG Plant Project
Orange County, CA



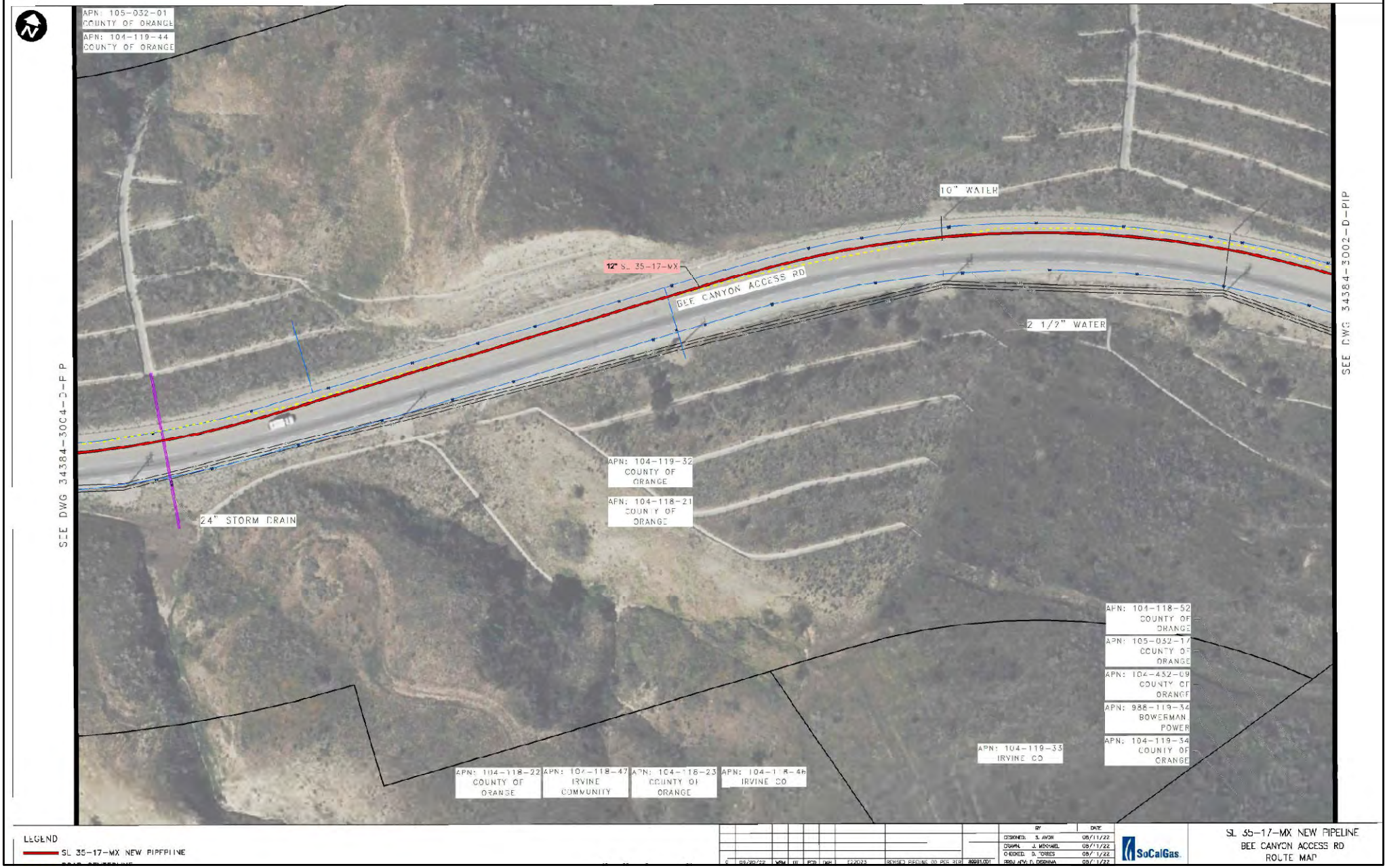
Pipeline Route

NOT FOR CONSTRUCTION

0 25 50 100 Feet

Figure 1-4.2
Pipeline Route
Sheet 2 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route

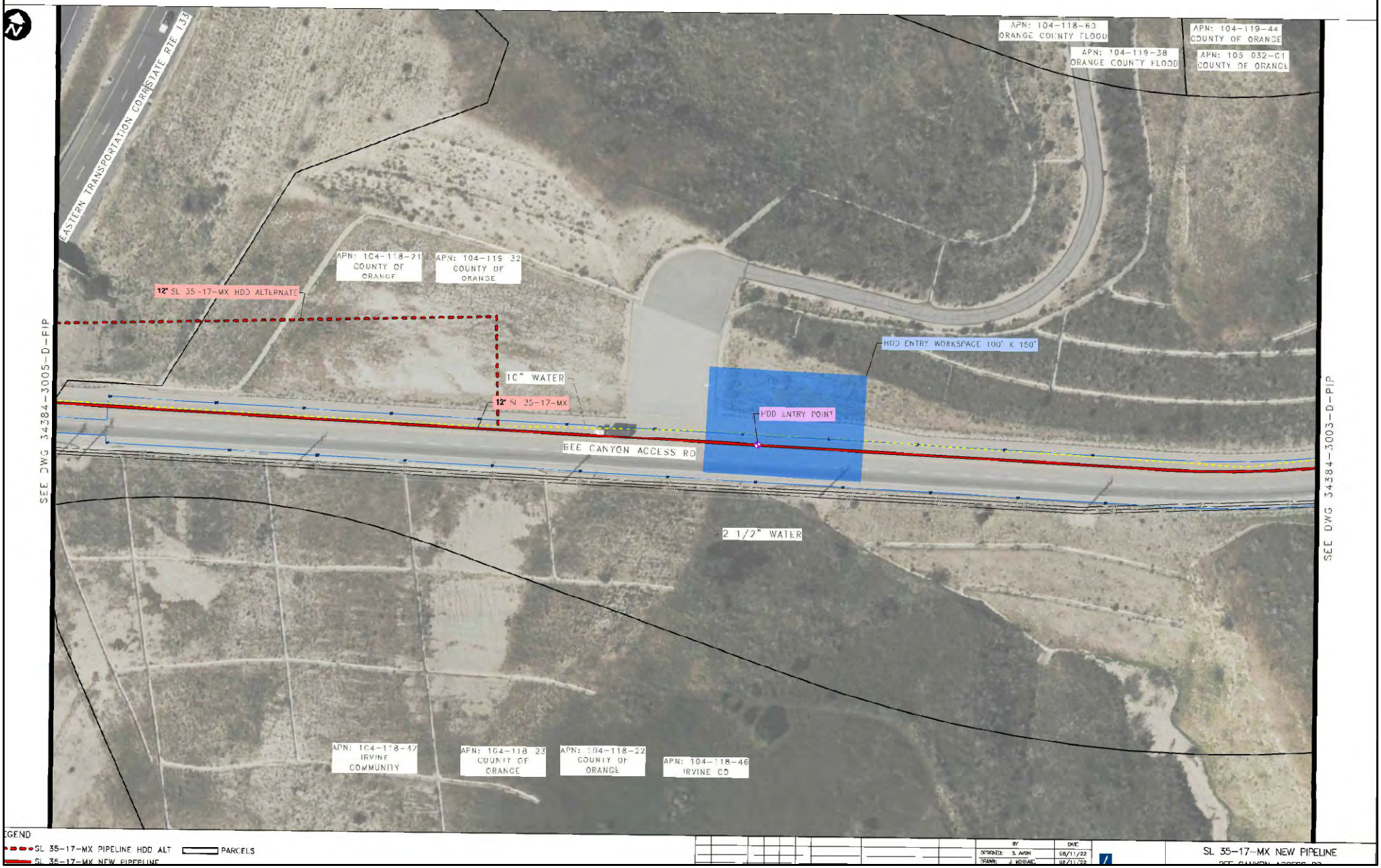
N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 1-4.3
Pipeline Route
Sheet 3 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route

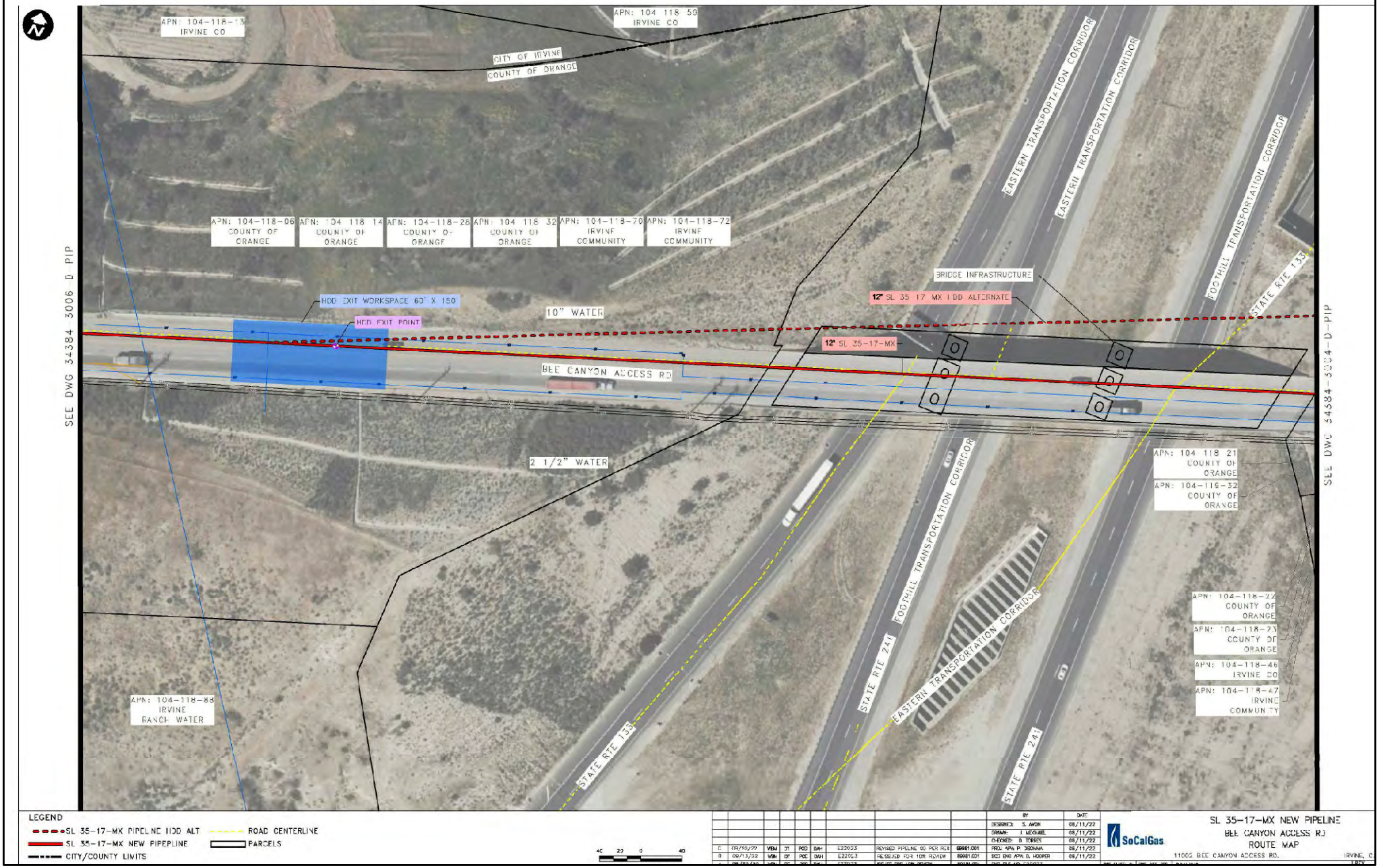
N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 1-4.4
Pipeline Route
Sheet 4 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route

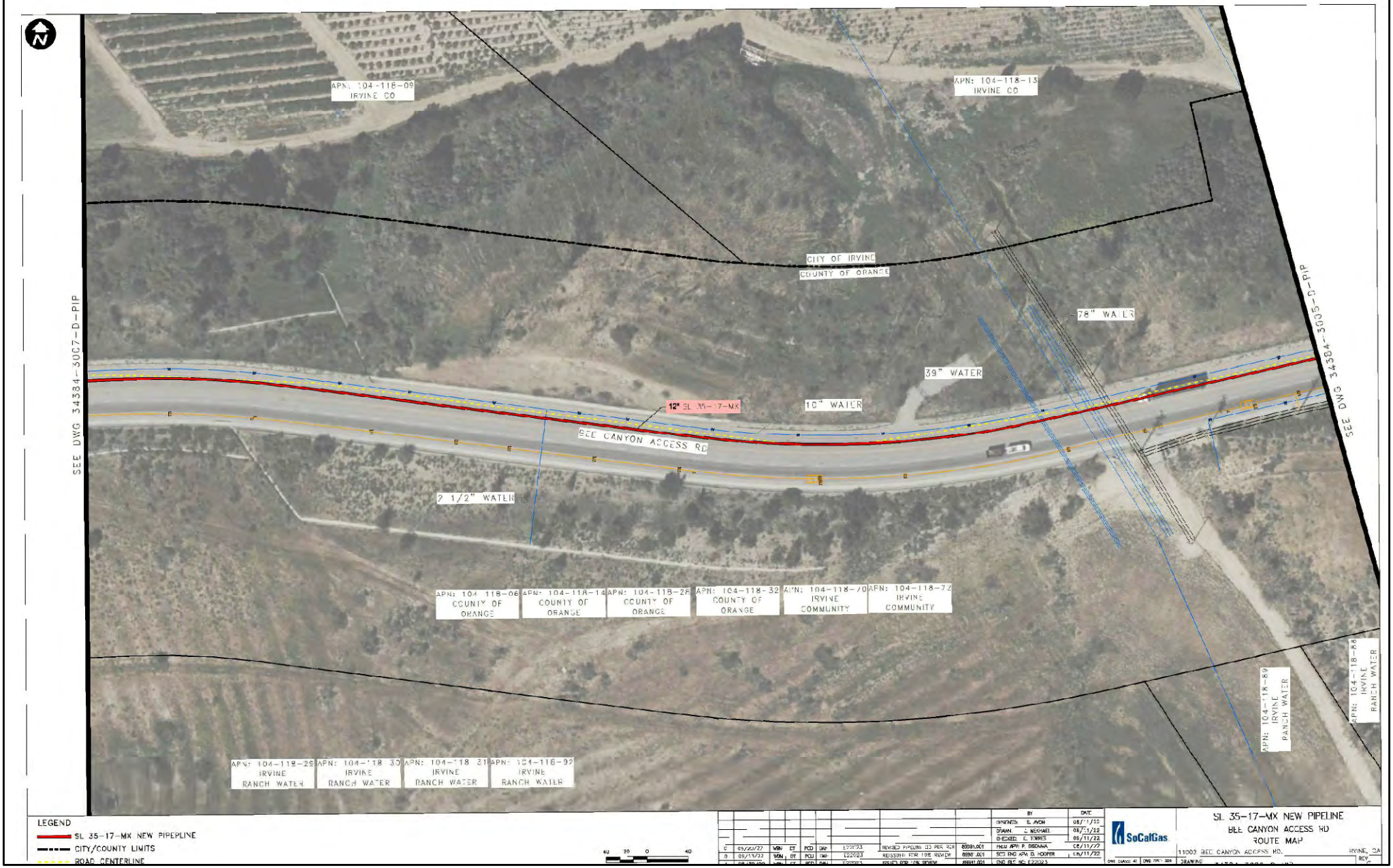
NOT FOR CONSTRUCTION

N

0 25 50 100 Feet

Figure 1-4.5
Pipeline Route
Sheet 5 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route

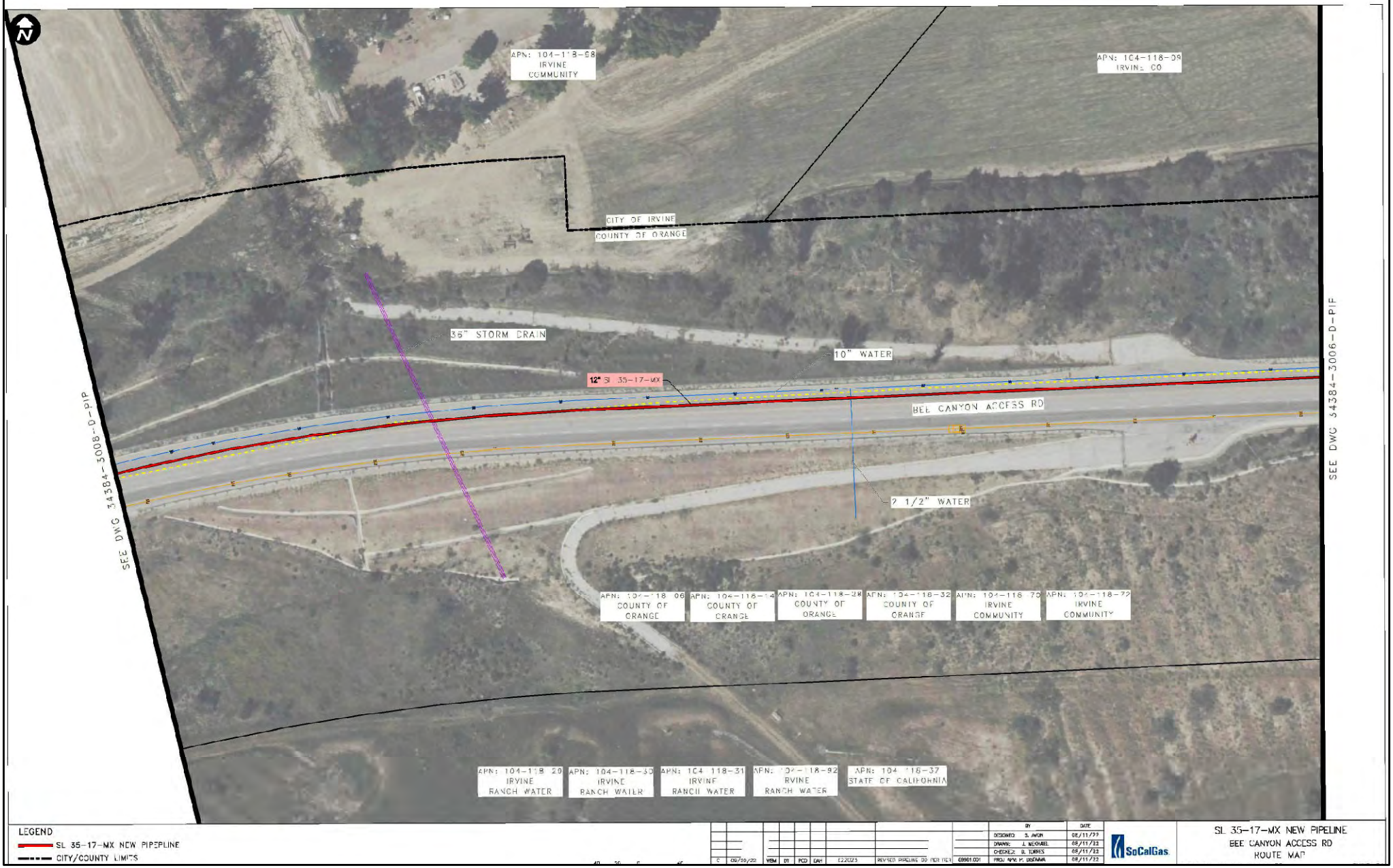
N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 1-4.6
Pipeline Route
Sheet 6 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route

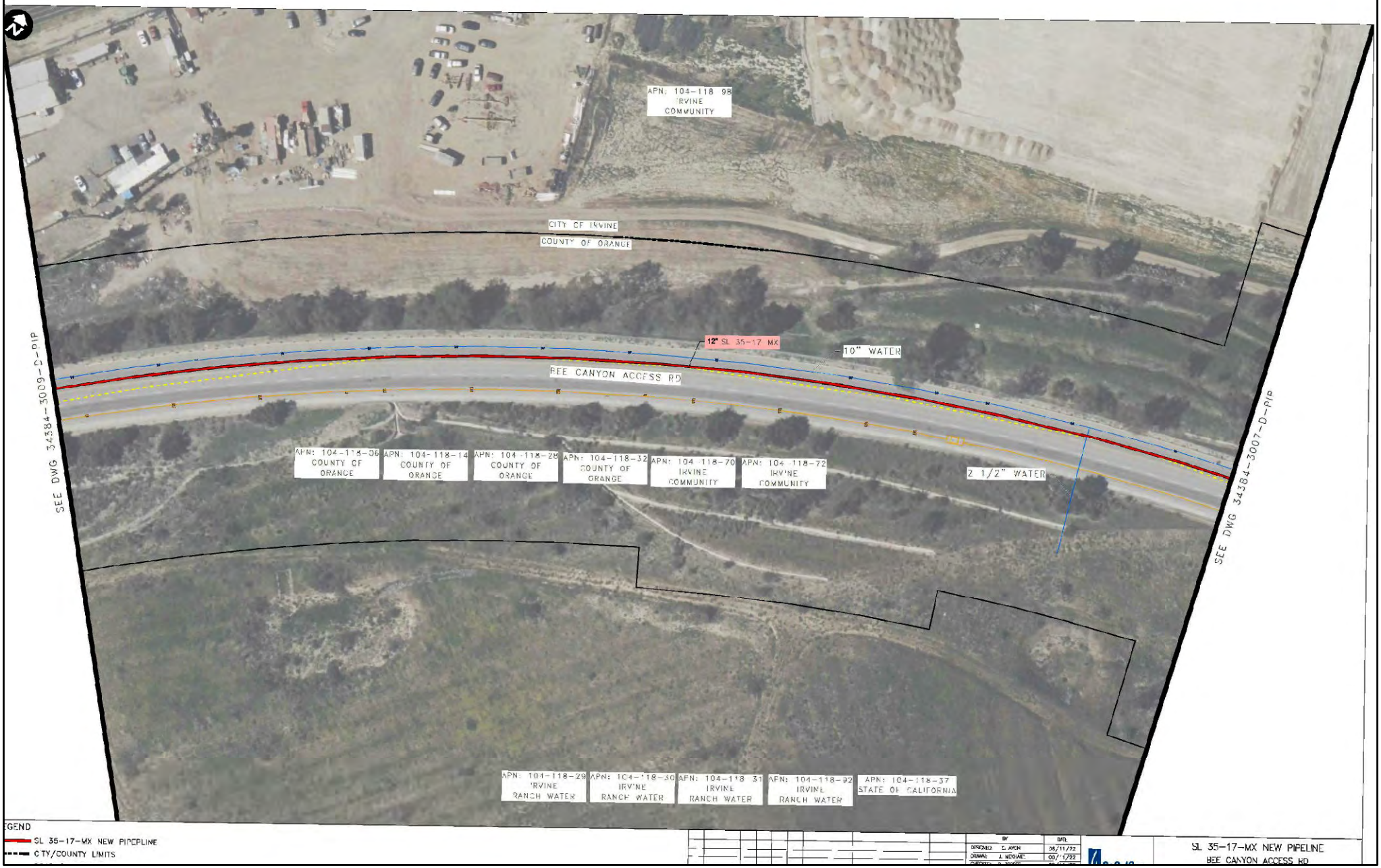
N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 1-4.7
Pipeline Route
Sheet 7 of 12

Bowerman Power RNG Plant Project
Orange County, CA



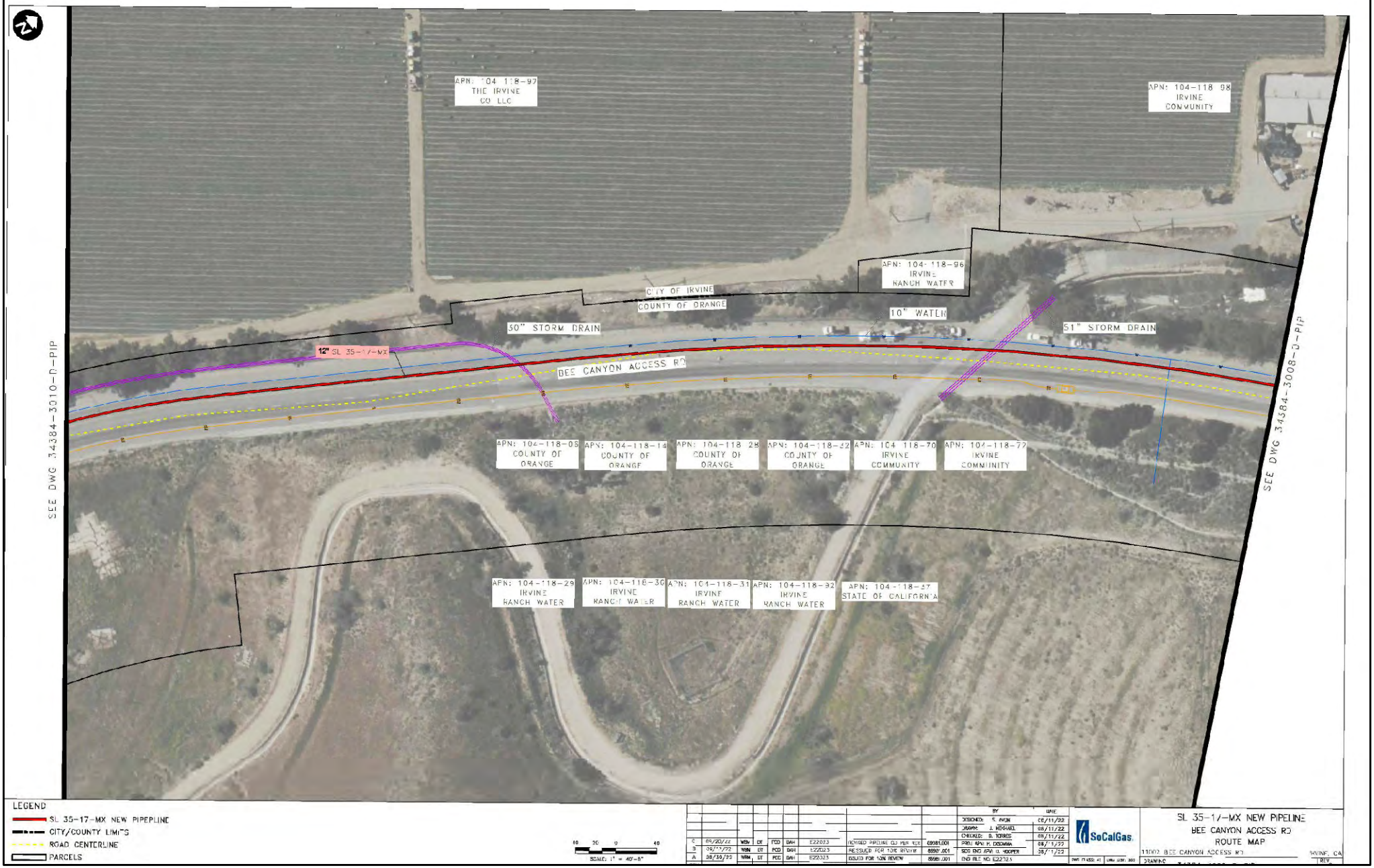
Pipeline Route

NOT FOR CONSTRUCTION

0 25 50 100 Feet

Figure 1-4.8
Pipeline Route
Sheet 8 of 12

Bowerman Power RNG Plant Project
Orange County, CA



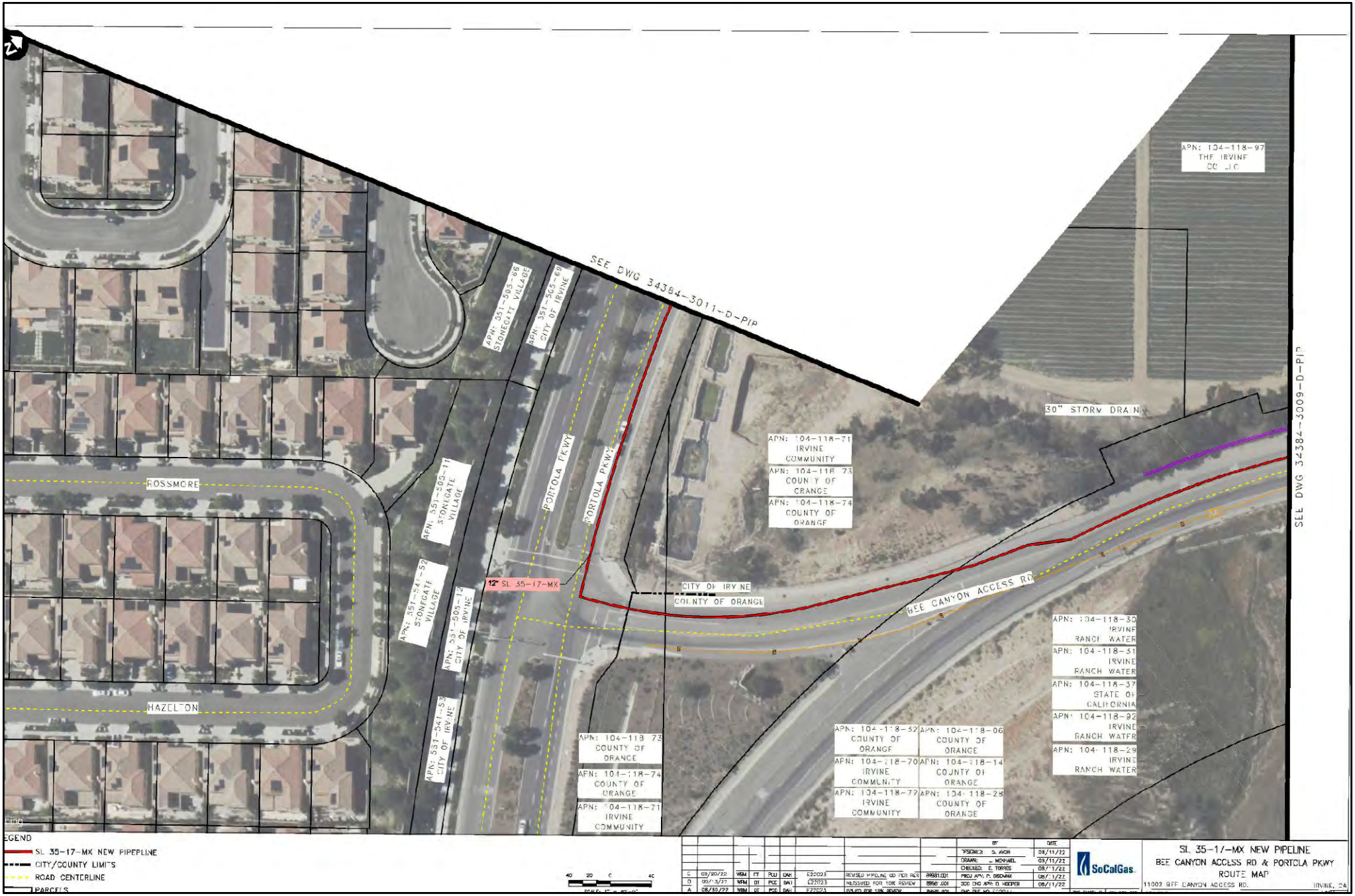
Pipeline Route

NOT FOR CONSTRUCTION

0 25 50 100 Feet

Figure 1-4.9
Pipeline Route
Sheet 9 of 12

Bowerman Power RNG Plant Project
Orange County, CA



Pipeline Route

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 1-4.10
Pipeline Route
Sheet 10 of 12

Bowerman Power RNG Plant Project
Orange County, CA

Pipeline Route

N

0 25 50 100 Feet

NOT FOR CONSTRUCTION

Figure 1-4.11
Pipeline Route
Sheet 11 of 12

Bowerman Power RNG Plant Project
Orange County, CA

Pipeline Route

Project Site

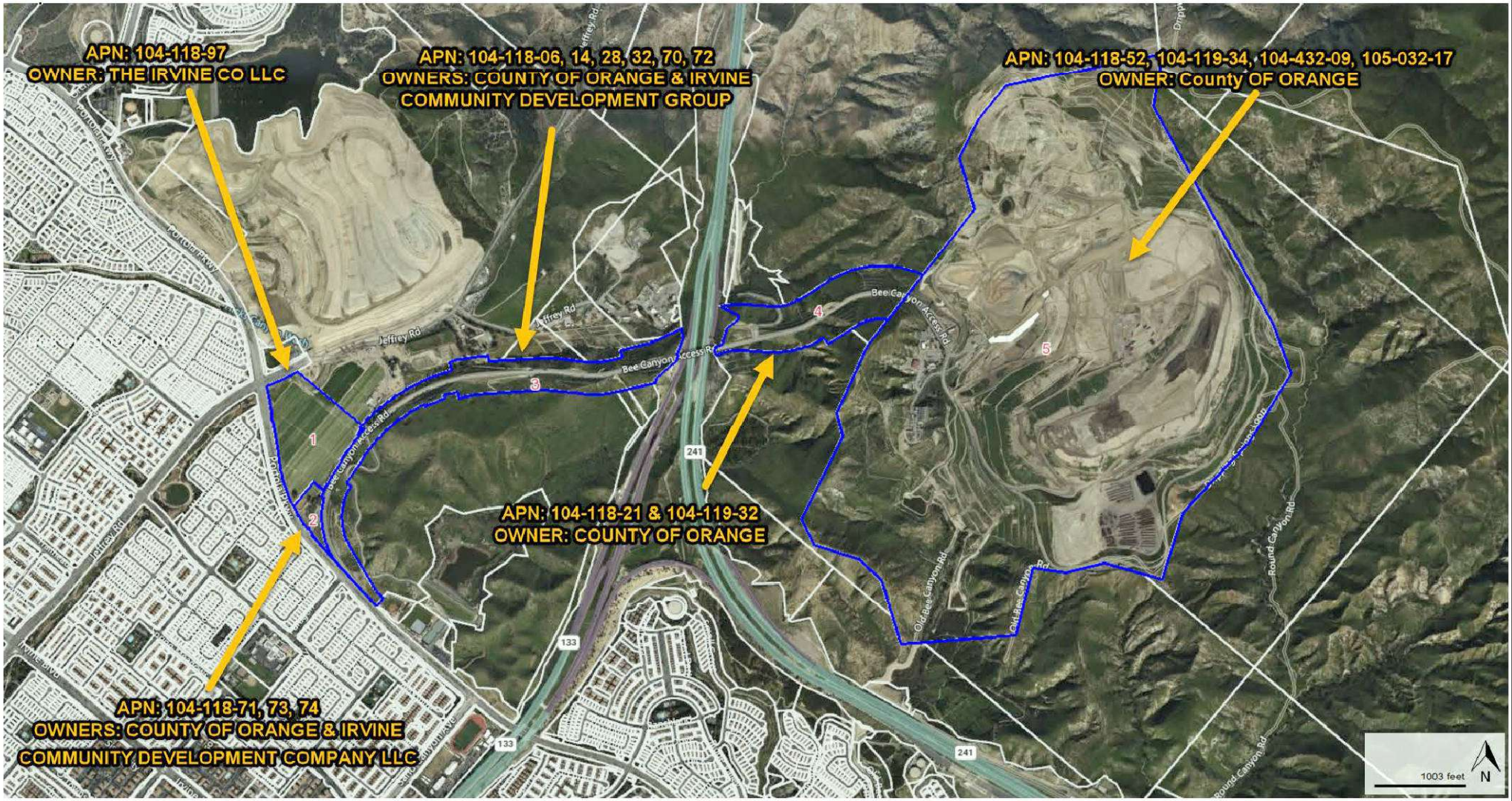
NOT FOR CONSTRUCTION

N

0 25 50 100 Feet

Figure 1-4.12
Pipeline Route
Sheet 12 of 12

Bowerman Power RNG Plant Project
Orange County, CA



NOT FOR CONSTRUCTION

Figure 1-5
Project Site Parcels

Bowerman Power RNG Plant Project
Orange County, CA

1.2 AREA OF POTENTIAL SIGNIFICANT IMPACT

The Project site for the proposed RNG Plant site is approximately 3.5 acres and situated in a partially undeveloped area within the FRB Landfill property, see Figure 1-5. The proposed construction of the Project site will consist of grading activities requiring a small number of on-site cuts (slope preparation) and then a large amount of engineered fill will be placed to create the pad area on which the RNG Plant will be constructed. The fill will be extracted from the existing FRB Landfill Soil Stockpile Area that was previously disturbed and used routinely for the deposition of fill materials. See Figures 1-2 and 1-3.

The Project pipeline route is approximately 2 miles long and within the existing three-lane Bee Canyon Access Road and approximately 0.4 mile long and within the existing two-lane Portola Parkway. All construction and laydown areas (defined as the work area and will be 50 feet in width) will take place within the existing road right of way. Construction of the pipeline will consist of the installation of a 12-inch pipe by excavating a pipeline trench approximately 30 inches in width and an average of 6 feet in depth.

1.3 REGULATORY COMPLIANCE

1.3.1 State

California Environmental Quality Act

CEQA (Section 21084.1) requires a lead agency to determine whether a project could have a substantial adverse change in the significance of a historical resource or tribal cultural resources (Section 21084.2).

Under CEQA (Section 15064.5 (a)), a historical resource (e.g., building, structure, or archaeological resource) shall include resource that is listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR), or a resource listed in a local register or landmark, identified as significant in a historical resource survey (meeting the requirements of Section 5024.1(g) of the Public Resource Code [PRC]), or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California (Section 15064.5[a][3]). Under the California Code of Regulations, Title 14, Chapter 11.5, properties listed on or formally determined to be eligible for listing in the National Register of Historic Places (NRHP) are automatically listed in the CRHR. A resource is generally considered to be historically significant under CEQA if it meets the following criteria for listing in the CRHR (PRC SS5024.1, Title 14, Code of Regulations, Section 4852):

A. Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States (Criterion 1).

B. Associated with the lives of persons important to local, California or national history (Criterion 2).
C. Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values (Criterion 3).
D. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation (Criterion 4).

Under PRC Section 21074:

(a) tribal cultural resources are:
(1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe that are either of the following:
(A) Included or determined to be eligible for the inclusion in the CRHR, or;
(B) Included in a local register of historical resources as defined by subdivision (k) of Section 5020.1 (designated or recognized historically significant by a local government pursuant to local ordinances or resolution).
(2) 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.
(b) 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.
(c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a “nonunique 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).

California Health and Safety Code, Section 7050.5

Section 7050.5 (a) states that it is a misdemeanor (except as provided in Section 5097.99, see below) to knowingly mutilate or disinter, wantonly disturb, or willfully remove any human remains in or from any location other than a dedicated cemetery without the authority of law. The provisions of this subdivision shall not apply to any person carrying out an agreement developed pursuant to subdivision (l) of Section 5097.94 of the Public Resources Code or to any person authorized to implement Section 5097.98 of the Public Resources Code. Section 7050.5 (b) requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner of the County (in which the human remains are discovered) can determine whether the remains are subject to the coroner’s authority. The coroner shall make their determination within two working days from the time the person responsible for the excavation, or that person’s authorized representative, notifies the coroner of the discovery of human remains. Per Section 7050.5 (c), if the coroner determines the remains are not subject to their

authority and recognizes the remains to be Native American or has reason to believe they are those of a Native American, the coroner shall contact, by telephone within 24 hours, the California Native American Heritage Commission (NAHC).

California Native American Historical, Cultural, and Sacred Sites Act

The California Native American Historical, Cultural, and Sacred Sites Act applies to both state and private lands. The Act requires that upon discovery of human remains, construction or excavation activity cease and that the county coroner be notified. If the remains are Native American, the coroner must notify the NAHC. The NAHC will then identify and notify a most likely descendant. The Act stipulates the procedures the most likely descendant may follow for treating or disposing of the remains and associated grave goods.

California Public Resource Code, Section 5097.5 and 5097.99

Section 5097.5 of the Code states:

No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

As used in this section, “public lands” means lands owned by, or under the jurisdiction of the state or any city, county, district, authority, public corporation, or any agency thereof.

Section 5097.99 of the Code states:

> (a) No person shall obtain or possess any Native American artifacts or human remains which are taken from a Native American grave or cairn on or after January 1, 1984, except as otherwise provided by law or in accordance with an agreement reached pursuant to subdivision (l) of Section 5097.94 or pursuant to Section 5097.98.
>
> (b) Any person who knowingly or willfully obtains or possesses any Native American artifacts or human remains which are taken from a Native American grave or cairn after January 1, 1988, except as otherwise provided by law or in accordance with an agreement reached pursuant to subdivision (l) of Section 5097.94 or pursuant to Section 5097.98, is guilty of a felony which is punishable by imprisonment pursuant to subdivision (h) of Section 1170 of the Penal Code.
>
> (c) Any person who removes, without authority of law, any Native American artifacts or human remains from a Native American grave or cairn with an intent to sell or dissect or with malice or wantonness is guilty of a felony which is punishable by imprisonment pursuant to subdivision (h) of Section 1170 of the Penal Code.

Assembly Bill 52

Under CEQA, Assembly Bill 52 (Section 5, 21080.3.1) requires a lead agency to consult with any California Native American tribe that is traditionally and culturally affiliated with the geographic area of a proposed project if:

1. A Native American tribe requested to the lead agency, in writing, to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe; and
2. The California Native American tribe responds, in writing, within 30 days of receipt of the formal notification, and requests the consultation.

Consultations may include a brief description of the proposed project and its location, the lead agency contact information, the type of environmental review necessary, the significance of tribal cultural resources, and the significance of the project's impacts on the tribal cultural resources, and alternatives and mitigation measures recommended by the tribe. Consultation, if requested, must take place prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report, if required for a project.

1.3.2 Local

The applicable land use plan for the project area is the Orange County General Plan (Orange County 2012). The current plan, amended in 2012, Chapter VI Resource Element section provides for a comprehensive, framework designed to protect Orange County's cultural resources through goals, policies, and objectives. The Orange County General Plan goals, objectives, and policies specific to archaeology are as follows:

Goal 2: To encourage through a resource management effort the preservation of the county's cultural and historic heritage.

Objective

- 2.1: Promote the preservation and use of buildings, sites, structures, objects, and districts of importance in Orange County through the administration of planning, environmental, and resource management programs.
- 2.2: Take all reasonable and proper steps to achieve the preservation of archaeological and paleontological remains, or their recovery and analysis to preserve cultural, scientific, and educational values.
- 2.3: Take all reasonable and proper steps to achieve the preservation and use of significant historic resources including properties of historic, historic architectural, historic archaeological, and/or historic preservation value.
- 2.4: Provide assistance to County agencies in evaluating the cultural environmental impact of proposed projects and reviewing Environmental Impact Reports.
- 2.5: Provide incentives to encourage greater private sector participation in historic preservation.

Policies: The following policies addressing archaeological, paleontological, and historical resources shall be implemented at appropriate stage(s) of planning, coordinated with the processing of a project application, as follows:

- Identification of resources shall be completed at the earliest stage of project planning and review such as general plan amendment or zone change.
- Evaluation of resources shall be completed at intermediate stages of project planning and review such as site plan review, subdivision map approval, or at an earlier stage of project review.
- Final preservation actions shall be completed at final stages of project planning and review such as grading, demolition, or at an earlier stage of project review.

Archaeological Resources Policies:

1. To identify archaeological resources through literature and records research and surface surveys.
2. To evaluate archaeological resources through subsurface testing to determine significance and extent [as appropriate].
3. To observe and collect archaeological resources during the grading of a project.
4. To preserve archaeological resources by:
    a. Maintaining them in an undisturbed condition, or
    b. Excavating and salvaging materials and information in a scientific manner.

2.0 ENVIRONMENTAL SETTING

The Project is situated within Bee Canyon and the hills along the western flank of the Santa Ana Mountains, this area is ecological diverse, and a summary of the natural setting is provided below. Note: the vegetation section was extracted from the biological survey report for the Project (Tetra Tech, Inc. 2023).

2.1 NATURAL SETTING

The proposed Project is located within the Peninsular Ranges Geomorphic Province, which is a series of ranges separated by northwest trending valleys, almost parallel to faults branching from the San Andreas Fault. The Peninsular Ranges extend into lower California and are bound on the east by the Colorado Desert Geomorphic Province. The Los Angeles Basin and the Southern Channel Islands (Santa Catalina, Santa Barbara, San Clemente, and San Nicolas islands), together with the surrounding continental shelf, are included in this province (California Department of Conservation, California Geological Survey 2002). Specifically, the Project is situated along the western canyons and foothills of Loma Ridge within the northwestern flank of the Santa Ana Mountains (a northwest trending range). Elevations at Loma Ridge range from approximately 1,000 to 2,000 feet. Several ephemeral drainages are near the Project within Bee, Hicks, and Round Canyons. Santiago Creek is approximately 4 to 5 miles northeast and east of the Project, and Serrano and Aliso Creeks are about 4 to 6 miles south-southeast. Geological deposits within the Project site and Project pipeline route consist of mostly marine sedimentary rocks with an age range from Miocene epoch (5 million to 23 million years in age) back to the Eocene epoch (35 million to 55 million years old). The following formations are within the Project and adjacent areas (Morton 2004):

- Puente Formation (early Pliocene and Miocene). Marine sandstone, siltstone, and shale underlying most of the Puente Hills and extending into adjacent areas.
- Topanga Formation (middle Miocene). Marine sandstone, siltstone, and shale. At type locality, Topanga Canyon, unit contains middle Miocene fauna (fossils).
- Vaqueros Formation (early Miocene, Oligocene, and late Eocene). Predominantly sandstone, with thin-bedded shales and siltstones. Contains early Miocene shallow-water marine mega-fossil assemblages.
- Sespe Formation (early Miocene, Oligocene, and late Eocene). The Sespe formation can be varied in color from gray to red, is generally massive- to thick-bedded, nonmarine sandstones. In Sespe Creek, Ventura County, this formation conformably underlies marine sandstones of the Vaqueros formation. Continental vertebrate fossil collections originating from the Sespe formation range in age from Eocene to early Miocene.

The non-marine exception in these formations is the Sespe, which is also the underlying geology at the Project site. The pipeline originates in the Sespe formation but also crosses Vaqueros formation rocks as well as Quaternary sediments (both alluvial and landslide deposits).

Soils within the Project site and eastern most reach of the proposed SoCal Gas pipeline route consist of Calleguuas clay loam from 0 to 7 inches in depth, and very channery clay loam from 11 to 15 inches, and bedrock from 15 to 59 inches (NRCS 2023). Soils within the Project pipeline route (from east to west) consist primarily of Anaheim clay from 0 to 26 inches, and weathered bedrock from 26 to 59 inches and a small segment of Cieneba sandy loam 0 to 17 inches and weathered bedrock from 17 to 59 inches; and Sorrento loam 0 to 12 inches, silt clay loam 12 to 67 inches, and sandy loam 62 to 72 inches at the very western terminus of the route (NRCS 2023).

2.1.1 Vegetation

Sagebrush Scrub (Project Site): Sagebrush scrub covers about 70 percent of the Project site. This habitat group has over 100 percent vegetation coverage. The dominant shrub within the habitat is California sagebrush (*Artemisia californica*). Interspersed within the California sagebrush are native species such as California buckwheat (*Eriogonum fasciculatum*), deerweed (*Acmispon glaber*) and brittlebrush (*Encelia farinosa*). Native succulent species like coast prickly pear (*Opuntia littoralis*), chalk dudleya (*Dudleya pulverulenta*), and lance-leaved dudleya (*Dudleya lanceolata*) are also found interspersed in this habitat. Rock outcrops are present at the top of some of the steep slopes in the sagebrush scrub, mostly bordering the existing facility to the west. Along the edges of this habitat and spaced between shrubs are patches of non-native species like Mediterranean hoary mustard (*Hirschfeldia incana*) and prickly lettuce (*Lactuca serriola*). Immediately surrounding the existing facility are non-native grass species, such as oat (*Avena* sp.). There is no tree canopy within this habitat. Within the sagebrush scrub and along the margins of the coast live oak (*Quercus agrifolia*) habitat are populations of a California native rare plant, intermediate mariposa lily (*Calochortus weedii* var. *intermedius*).

Coast Live Oak (Project Site): Along the slope, coast live oak dominants the tree canopy. The tree understory is comprised of non-native grasses, like ripgut grass (*Bromus diandrus*) and foxtail chess (*Bromus madritensis*), and sparse coverage of low-growing sagebrush scrub species, like California buckwheat.

Developed (Project Site): A concrete channel runs from north to south at the base of the slope and along the roadside of Bee Canyon Access Road. Water run-off from the existing landfill gas-to energy facility is fed into the channel through smaller concrete channels and culverts at the north end of the channel. The channel bed is filled with soil debris. The channel feeds into an isolated evaporation/collection pool south of the existing facility.

Pipeline Developed: This area encompasses Bee Canyon Access Road, Portola Parkway, and any structures in and along the road, such as fencing and gates.

Pipeline Disturbed: These areas include hardpan pads along the roadside of Bee Canyon Access Road. These pads are vegetated with primarily non-native ruderal species like Mediterranean hoary mustard. Also, colonizing shrubs of California sagebrush grow on the

pads. There is also a portion of the roadside (north of Portola Parkway), which is habitat disturbed by current agricultural practices.

Pipeline Sagebrush Scrub: This habitat is on a slope and is covered by California buckwheat and California sagebrush. One-foot-wide, unvegetated concrete channels run along the roadside and through this habitat.

Pipeline Disturbed Sagebrush Scrub: Along the north side of Bee Canyon Access Road, towards the end of the proposed pipeline that opens up to Portola Parkway, is a gravel pad covered in low-growing (under 1-foot) California buckwheat. Interspersed within the buckwheat are ruderal species such as Mediterranean hoary mustard and clustered tarweed (*Deinandra fasciculat*a). This area appears to be disturbed by adjacent construction activities.

Pipeline Eucalyptus: A strip of eucalyptus (*Eucalyptus* sp.) grove habitat runs along the north side of Bee Canyon Access Road. Eucalyptus trees over 15-feet tall dominate the tree canopy. Eucalyptus trees under 8-feet, annual grasses, and leaf litter dominate the ground canopy.

Pipeline Ornamental Trees: Along the south side of Portola Parkway are trees planted for roadside beautification. Tree species include acacias (*Acacia* sp.), conifers (*Pinus* sp*.),* and redwood (*Sequoia* sp*.)* species. Within the ROW are paved sidewalks and utility boxes.

2.1.2 Wildlife

The Santa Ana Mountain region supports a variety of wildlife such as mule deer (*Odocoileus hemionus*), desert cottontail, (*Sylvilagus audubonii*), California ground squirrel (*Otospermophilus beecheyi*), mountain lion (*Felix concolor*), bobcat (*Lynx rufus*), coyotes (*Canis latrans*), and other small animals and rodents (Alden et al. 1998). Several avian species inhabited the region such as the greater roadrunner (*Geococcyx californianus*), red tailed hawk (*Buteo jamaicensis*), turkey vulture, (*Cathartes aura*), canyon wren (*Catherpes mexicanus*), and several others (Alden et al. 1998).

Species that once inhabited the Santa Ana Mountain region included California grizzly bear (*Ursus arctos californicus*), gray wolf (*Canis lupus*), pronghorn antelope (*Antilocarpa americana*), and the California condor (*Gymnogyps californianus*). The last California grizzly bear was killed in Orange County in 1903 (Orange County 2023).

Prehistoric populations used a variety of mineral, faunal and floral resources for subsistence, medicinal, religious, and utilitarian purposes.

3.0 CULTURAL CONTEXT

The following includes a literature review of available data for the Project, record search and historic aerial and map review, and the results of the NAHC sacred lands file search.

3.1 PREHISTORIC OVERVIEW

There is no single cultural historical framework that encompasses the entire prehistoric record for southern California. Several key archaeologists have contributed to the development and chronological framework throughout regions of southern California such as Wallace (1955), Warren (1968), Warren and Crabtree (1986), Moratto (1984), Chartkoff and Chartkoff (1984), Byrd and Raab (2007), and several others. The prehistory of the southern California region has been generally summarized within four major horizons or cultural periods and a brief summary is provided below: Horizon 1 – Early Period (12,000 to 7,500 years before present [BP]), Horizon II – Millingstone Horizon (7,500 to 3,000 BP), Horizon III – Intermediate Cultures (3,000 to 1,000 BP), and Horizon IV – Late Prehistoric (1,000 BP to European historic contact).

Horizon I – Early Period (Early Holocene: 12,000 to 7,500 years BP) characterized by small mobile groups that utilized lithic tools such as stemmed projectile points, fluted projectile, crescent, scrapers, and choppers.

Horizon II – Millingstone Horizon (Middle Holocene: 7,500 to 3,000 BP) characterized by the extensive use of milling stones (manos and metates) to process small, hard seeds from plants associated with shrub-scrub communities and littoral zone resource exploitation.

Horizon III – Intermediate Culture (Middle Holocene: 3,000 to 1,000 BP) is characterized by mixed subsistence strategy of plant exploitation (increased use of pestles for larger, hard seeds) and the hunting of terrestrial and marine resources.

Horizon IV – Late Prehistoric (Late Holocene: 1,000 BP to European historic contact) is characterized by an increasing human population and associated expansion of cultural practices, and the use of the bow and arrow, pottery, shell fishhooks, use of asphaltum, and decorative shell and bone ornaments were all typical during this time.

3.2 ETHNOGRAPHIC OVERVIEW

It should be noted that the summary below is drawn from studies conducted by 19th and 20th century Euro-American ethnographers and does not necessarily include a Tribal perspective of their culture.

The Project area is also within the ethnographic territory traditionally inhabited by the Kizh (Kisiannos) (Stickel 2016, Strong 1987, Johnston 1962, McCawley 1996). The Kizh occupied most of Los Angeles and Orange counties, parts of Riverside and San Bernardino counties, including the watersheds of the Los Angeles, San Gabriel, and Santa Ana rivers, the Los

Angeles basin to the Santa Monica and Santa Ana mountains, along the coast from Aliso Creek in the south to Topanga Creek in the north, and the Channel Islands such as San Clemente, San Nicolas, and Santa Catalina (Bean and Smith 1978; Kroeber 1925).

Kizh are a member of the Cupan languages in the Takic family, part of the Uto-Aztecan linguistic stock. There were up to six different dialects spoken throughout the Kizh territory. Settlement patterns on the mainland were located near water sources and exhibit a logistical mobility with large villages and smaller satellite camps occupied seasonally. Structures were domed, circular structures with tule, fern, or Carrizo thatching and sweathouses were small, semicircular, earth-covered buildings (Bean and Smith 1978). Although it is unknown exactly how many people inhabited the area, it is estimated that at least 50 to 100 villages occupied the mainland and coastal region, with village populations ranging from 50 to 200 individuals (Bean and Smith 1978). The Kizhwere fisher-hunter-gatherers and exploited a variety of coastal bay, littoral, riverine, and inland floral and faunal resources available within the diverse ecological zones of their territory (i.e., coastal plain, rivers, foothills, mountains, and ocean). Subsistence resources included items such as several species of oak trees, grasses, sage bushes, rabbits, deer, fish, shellfish, and other terrestrial and marine mammals. The Kizh would move seasonally throughout the region, between mountain and coastal locales, to hunt terrestrial and sea mammals and to collect terrestrial flora and intertidal species. In 1771, the San Gabriel mission was established, and the Spanish begin to enslave and force the Kizh into the mission system. The Spanish changed the Kizh ancestral name to Gabrieleño (Stickel 2016; Bean and Smith 1978). By 1800, many of the Kizh were missionized and many had succumbed to the harsh conditions of the mission system, introduced diseases or conflicts, or fled the area (Bean and Smith 1978). Nineteenth century Euro-American ethnographers changed the spelling of Gabrieleño to an English spelling of Gabrielino. However, the ancestral Kizh name was used to refer to the Kizh by other surrounding Tribes in Southern California at the time of historic contact (Strong 1987, Bean and Smith 1978, Johnston 1962, McCawley 1996). Currently, the Kizh-Nation (historically, also known as the San Gabriel Band of Mission Indians) are a state of California recognized tribe and their tribal office is located in Los Angeles, California.

3.3 HISTORIC OVERVIEW

European settlement began in 1771, when Spanish missionaries began to settle along the California coast and adjacent inland areas. Following the Mexican-American War and secularization of the nearby missions in 1834, the region was transferred to private landowners (ranchos) who established a primary economy of cattle ranching. Specifically, in the Project area Lomas de Santiago. Don Theodocio Yorba was granted Lomas de Santiago on May 26, 1846. The rancho was later sold to William Wolfskill in 1860 (also see Section 3.4.2). After the fall of the rancho system, European settlers purchased substantial land holdings in the area. The Flint, Bixby, & Company (sheep ranching business) acquired Rancho San Joaquin and Lomas de Santiago in 1864 (Los Angeles Times 1987). James Irvine I was a silent partner in the land acquisition and established the Irvine Ranch (Irvine Historical Society 2023). James' son, James Irvine II, would later inherit the land in 1892 and bought out the other partners, and

established the Irvine Company (Irvine Historical Society 2023). The local economy included large-scale farming and fruit orchards and sheep and cattle ranching. In 1889, the Orange County seat was located in Santa Ana and this further stimulated the development of businesses, stores, financial institutions and hotels serving the regional metropolitan population. Orchards and crops were plentiful and buying and selling of goods and land became the number one enterprise. By the 1930s, the Irvine Company implemented several irrigation projects to provide a stable source of water to the agricultural areas (Irvine Historical Society 2023). Urban development (e.g., residential subdivisions and commercial) began to take root in the 1920s through current times. Today, Orange County is densely developed with urban uses and limited vacant land. The FRB Landfill was constructed in the 1980s and opened in 1990 (OCWR 2023).

3.4 RECORD SEARCH METHODS AND RESULTS

A record search of the cultural resources site and project file collection at the South-Central Coastal Information Center (SCCIC), California State University, Fullerton, of the California Historical Resources Information System, was conducted on August 23, 2023 (Record Search File No.: 24773.11195, results are confidential and not included in this report). As part of this records search, the CHRIS database of survey reports and overviews was consulted, as well as documented cultural resources, cultural landscapes, and ethnic resources. Additionally, the search included a review of the following publications and lists: NRHP and CRHR. In addition, Tetra Tech staff reviewed ethnographic information, historical literature, historical maps and plats, and local historic resource inventories, and the Orange County General Plan sensitivity map. The SCCIC records search focused specifically on the proposed Project site and Project pipeline route and a quarter mile (0.25 mile) buffer extending from the Project site boundary (see Figure 1-4). In addition, the Orange Count Geneal Plan's County Archaeological Sensitivity map was also reviewed.

The SCCIC record search results identified 21 previously conducted cultural resource studies that overlap and are within the Project site and Project pipeline route. Previous reports OR-00305, OR-02225, OR-02534, OR-00847, OR-02935 and OR-04534 are within the Project site. Previous reports OR-00305, OR-02225, OR-02534 and OR-00847 are within the Project pipeline route; and reports OR-00648, OR-01214, OR-02342, OR-02845, OR-02935, OR-03824, OR-04534, OR1426, OR1557, OR252, OR253, OR859, and OR861 overlap with the Project pipeline route. These studies were conducted between 1978 and 2010 and consist of overviews, archaeological testing, excavation, and field surveys. Eleven previously conducted cultural resource studies were identified within 0.25 mile of the Project site and Project pipeline route. Five previously recorded cultural resources were identified but none of these five sites are adjacent to the Project site or pipeline linear route).

3.4.1 Orange County Geneal Plan Sensitivity Map

The County of Orange General Plan states that sub-surface resources such as archaeological and paleontological sites are abundant in Orange County. Based on the County of Orange General Plan Prehistoric Archaeology sensitivity map, the proposed Project site and Project pipeline route is located in areas mapped for prehistoric archaeological sensitivity (Orange County 2012).

3.4.2 Historic U.S. Geological Survey Map and General Land Office Plat Map and Historic Aerial Review

A review of historic maps and aerial imagery provides information regarding potential unrecorded historic features or sites within the Project Area. Based on the historic maps and aerial imagery review, the Project site and Project pipeline route appear relatively undeveloped until the 1980s. Based on aerial imagery, the areas near the southern portion of the Project pipeline route appear under agricultural use (row corps and orchards) from the 1940s to 1970s. By the 1980s, the FRB Landfill was under construction and Bee Canyon Access Road was improved (widened and paved) and the adjacent areas (including hillsides) were graded, cut, and terraced for erosion control with concrete culverts. The results of the review of available historic aerials, General Land Office plat maps, and USGS quadrangle maps are presented in Table 3-1 below.

Table 3-1. Historic Aerial Imagery and Map Review

Map Name	Date(s)	Author	Description
Aerial Imagery	1946	NETRonline	Project site and Project pipeline route appear as undeveloped land within hills and creeks. Agricultural land use is to the south in the valley.
Aerial Imagery	1952	NETRonline	Project site and Project pipeline route appear as undeveloped land within hills and creeks except the southernmost portion of the Project pipeline route appears as agricultural land. Agricultural land use is to the south, in the valley.
Aerial Imagery	1963, 1967, 1972	NETRonline	Project site appears as undeveloped land within hills. The southern portion of the Project pipeline route appears as agricultural land and an unnamed east to west trending dirt road appears to follow or is near the existing Bee Canyon Access Road. Agricultural land use is to the south, in the valley. No changes in 1967 or 1972. By the 1980s, Bee Canyon Access Road appears present and improved and large portions of land along the Project pipeline route appear graded and cleared of vegetation.
Aerial Imagery	1987	NETRonline	Project site: appears undeveloped, the surrounding area is developed as the FRB Landfill. Project pipeline route: By 1987, Bee Canyon Access Road has been improved and adjacent areas and hillsides along the entire road to the FRB Landfill appear graded, cleared of vegetation, and terraced with concrete culverts for erosion control. In addition, several orchards appear along the hillsides, north and south, of Bee Canyon Access Road.
GLO Plat Map	--	--	Not Available.
USGS 1:250,000, Southern California	1901		No buildings or features are illustrated in the project area.

Map Name	Date(s)	Author	Description
USGS 1:62,500 Santiago Peak, CA	1942	War Department Corps of Engineers, US Army	Project site and Project pipeline route: no buildings or features are illustrated. An unnamed road is illustrated near the southern portion of the Project pipeline route. The general area is labeled Lomas De Santiago.
USGS 1:24,000, El Toro, California	1947, 1956, 1960	USGS	Project site and Project pipeline route: no buildings or features are illustrated. The general area is labeled Lomas De Santiago.
USGS 1:24,000, El Toro, California	1968	USGS	Project site: no buildings or features are illustrated, undeveloped land. Project pipeline route: east to west trending two track road near southern portion of route (near current alignment of Bee Canyon Access Road). No other features or buildings illustrated.
USGS 1:24,000, El Toro, California	1997	USGS	Project site: undeveloped, landfill roads surround Project site. Project Pipeline route: Bee Canyon Access Road and Portola Parkway Road in current alignment. The general area is labeled: Lomas De Santiago.

GLO=General Land Office; USGS=U.S. Geological Survey; NETRonline https://www.historicaerials.com/viewer

3.4.3 Federal Land Patent Review

One early patent holder was identified within the nearby region of the proposed Project site and Project pipeline route for Township 5 South, Range 7 and 8 West, several sections. Under the Grant-Spanish/Mexican grant of 1851 (9 Atat. 631), Theodocio Yorba (or Teodosio) was granted Lomas de Santiago on May 26, 1846 (BLM 2023; Brigandi 2019). Based on the review of historic USGS topographical maps, Lomas de Santiago is a large area and is illustrated within the Project and surrounding areas. The rancho size was set at 47,200 acres by the U.S. Land Commission. This land was eventually acquired by James Irvine (1864: Bell 2013).

3.5 NATIVE AMERICAN HERITAGE COMMISSION SACRED LAND FILE SEARCH AND AB52 CONSULTATION

As part of the data collection, a NAHC Sacred Lands File Search was requested on July 20, 2023. The NAHC replied on August 21, 2023, and the results were negative (Appendix A). OCWR has initiated tribal consultation under Assembly Bill 52. Pursuant to notice provided on August 14, 2023, in accordance with PRC section 21080.3.1, the Kizh Nation (Tribe) requested consultation with Orange County in regard to the Project, by letter dated August 25, 2023 (sent via email). On October 12, 2023, the OCWR sent the Tribe the cultural resource memo and maps of the Project prior to the meeting. Following the meeting request, representatives from the Tribe and staff from OCWR engaged in consultation via telephone conference on October 17, 2023. Based on meeting results, the Tribal representatives consider the Project site and Project pipeline route sensitive for tribal cultural resources, the Tribe stated they would provide documentation of their proposed tribal cultural resources mitigation measures via email.

Therefore, OCWR has requested that tribal cultural resource mitigation measures be included in this document in an effort to assist in the protection of tribal cultural resources. The proposed measures are included in Section 5.0, and it should be noted that they were developed in light of not having yet received the Tribe's written documentation. In the event of an inadvertent

discovery or during monitoring, the Tribe may have additional protocols beyond what is provided in Section 5 and such protocols should be considered for Tribal cultural resources.

3.6 SOCALGAS CONSULTATION

Due to interagency Project activities, OCWR initiated consultation with SoCalGas on November 24, 2023. SoCalGas archaeologist Tricia Dodds provided comments on December 14, 2023 regarding cultural resources mitigation measures. SoCalGas comments are incorporated in the cultural resource and tribal cultural resource mitigation measures in Section 5.0.

4.0 FIELD INVENTORY METHODOLOGY AND RESULTS

4.1 FIELD SURVEY METHODS

A Phase I Archaeological Field Survey for the Project site and pipeline route was conducted on September 26, 2023 and March 7, 2024, by Tetra Tech's Principal Archaeologist Jenna Farrell, MA, RPA, and Archaeological Field Technicians, Astrid Molina, BA, and Cris Crump, BA. The Project site was visually inspected and photographed. This area was not systematically surveyed with linear transects. Meandering transects in accessible areas and visual spot checks were conducted as the Project site mostly contained 30 precent (or more) steep slopes with areas of dense vegetation that was impassible. A portion of the northeast corner of the Project site appeared recently graded, and the much of the southeast portion contained an existing erosion control drainage system of concrete culverts. The recently graded exposed soils were examined. No cultural material was observed within the Project site. See Figure 4-1.

The proposed Project pipeline route is within the existing Bee Canyon Access Road right-of-way. The road and road shoulder are paved with graveled pull-out areas. This road supports heavy equipment (dump trucks) travel to and from the FRB Landfill, large trucks continuously travel the route every day. All Project work and laydown areas will be maintained within the existing road right-of-way. Since the Project pipeline route is within a paved road and shoulder, and not natural ground surface visible, a reconnaissance level windshield (visual inspection) survey was conducted of the road. Areas with visible ground surface were inspected on foot along the pipeline route.

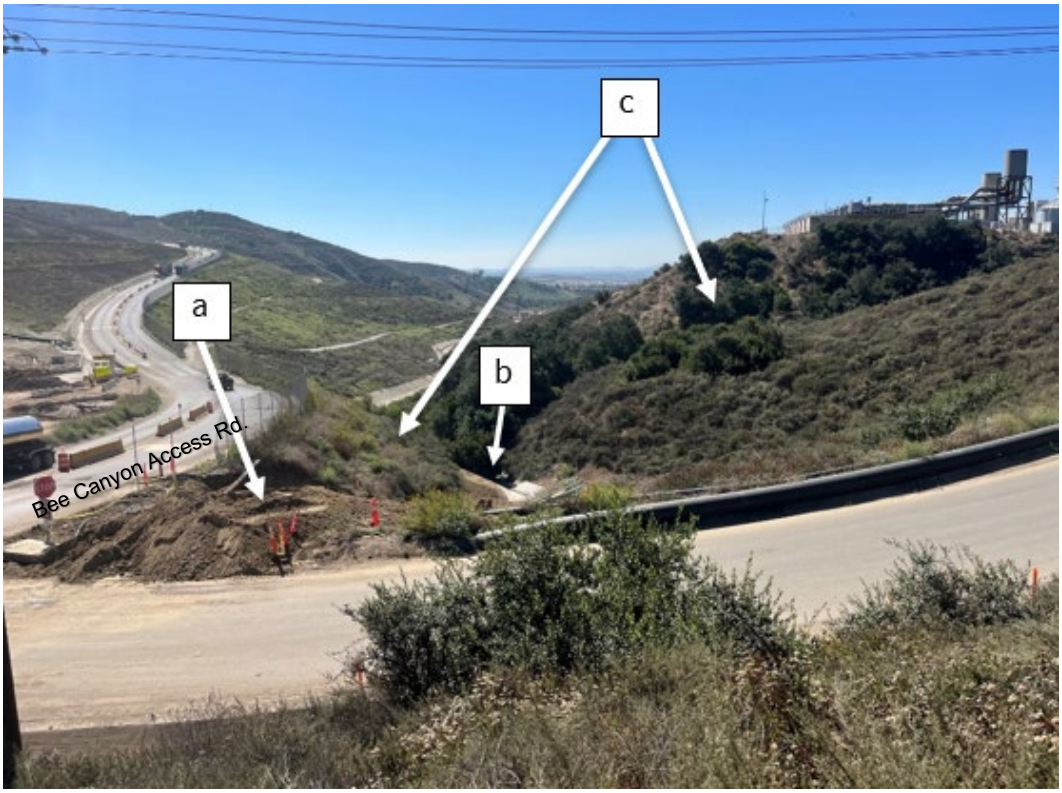


Figure 4-1. Overview of Project site and examined area. recently graded area with exposed soils and continues downslope; b. concrete culvert drainage system; c. over 30 percent slopes. Photograph taken from near intersection of Bee Canyon Access Road and an unnamed driveway to the FRB Landfill office (view south, image 3413).

4.2 FIELD SURVEY RESULTS

The entire Project site and pipeline were examined via field survey in accessible areas and visually examined in built areas or inaccessible areas. No cultural resource material was observed. Three previously recorded archaeological sites were field checked and have been impacted by modern development (infrastructure: development of the landfill, roads, and erosion maintenance) and are no longer extant.

5.0 CONCLUSION AND RECOMMENDATIONS

The SCCIC record search identified three previously recorded archaeological sites. The three previously recorded sites were field checked and are no longer extant within the Project due to past infrastructure development. No cultural resource material was observed during the field survey. Based on the background research and field survey, all three sites were impacted and appear destroyed because of this disturbance, no longer retain their integrity, and are recommended not eligible to the CRHR.

The development of the FRB Landfill and associated infrastructure has disturbed the natural surface and subsurface deposits of the proposed Project pipeline route and a small portion of the Project site. Although these soils are disturbed, they may still contain cultural material important to the tribe. In addition, intact cultural material may exist within undisturbed deposits.

Therefore, the following cultural resource and tribal cultural resource mitigation measures are recommended:

Cultural Resource Mitigation Measures

CR-01: Environmental Training – Prior to construction of the Project, a Secretary of Interior qualified archaeologist shall be retained by Bowerman Power to serve as the Project Archaeologist. Cultural resource awareness training will be provided by the Project Archaeologist that includes all applicable laws and penalties pertaining to disturbing cultural resources, a brief discussion of the prehistoric and historic regional context and archaeological sensitivity of the area, types of cultural resources found in the area, and instruction that Project workers will halt construction if a cultural resource is inadvertently discovered during construction, and Project personnel contact information in the event of an inadvertent discovery.

CR-02: Archaeological Monitoring – A qualified Archaeological monitor acceptable to the OCWR shall be retained by Bowerman Power prior to Project related ground disturbance. The selection of the qualified professional(s) shall be subject to OCWR acceptance based on generally accepted professional qualifications and certifications, as applicable. A qualified Archaeological Monitor will have at least a BS or BA degree in anthropology, archaeology, historic archaeology, or a related field and previous monitoring experience. The monitors will conduct on-site daily archaeological monitoring of construction ground disturbance. The Archaeological monitor will provide daily documentation of construction activity and any findings. The Archaeological monitor will prepare a daily monitoring log and submit it daily to the Project Archaeologist via email, briefly describing the field conditions, construction progress and activities, non-compliance activities, and record any finds of archaeological material. A final report summarizing the monitoring activities will be prepared by the Project Archaeologist.

CR-03: Monitoring and Inadvertent Discovery Plan – Prior to the start of construction, a Secretary of Interior qualified Project Archaeologist (retained by Bowerman Power) shall prepare

a Monitoring and Inadvertent Discovery Plan (Plan) for the Project. The Plan will be submitted to OCWR for review and approval prior to the start of construction. The Plan shall include at a minimum:

- Overview of mitigation measures and responsibility for compliance,
- Project description of construction activities and maps,
- Description of relevant laws and regulations,
- Brief cultural context information and types and description of cultural resources that could be inadvertently discovered,
- Description of how monitoring shall occur,
- The roles and responsibility of the Archaeological Monitor (e.g., authority to halt construction for an inadvertent discovery, daily monitoring, daily reporting, etc.) and Project Archaeologist (e.g., oversee monitors, response to inadvertent discovery, final reporting, etc.),
- Description of protocols in the event of an inadvertent discovery (i.e., halt work) and notification procedures and contact list, and
- Description of final monitoring report.
- Stop work protocols in the event of an inadvertent discovery of cultural resources. If a cultural resource is encountered within the new SoCalGas pipeline route, halt work protocols will include notifying the SoCalGas Project Archaeologist Ryan Glenn or SoCalGas Archaeologist Tricia Dodds and OCWR Environmental Engineering Specialist, Weena Dalby. See contact information below. Do not relocate cultural resources without consulting with a SoCalGas Archaeologist.

Existing regulations require that if human remains and/or cultural items defined by Health and Safety Code, Section 7050.5, are inadvertently discovered, all work in the vicinity of the find would cease and an exclusion zone buffer of at least 200 feet around the extent of the discovery will be demarked and protected, and the Orange County Sheriff-Coroner Office (714) 647-7400, will be contacted immediately. In addition, contact and notify SoCalGas Project Archaeologist Ryan Glenn (425) 213-2349 (cell) and RGlenn1@scgcontractor.com or SoCalGas Archeologist Tricia Dodds (213) 290-7449 (cell) and TDodds@socalgas.com, and OCWR Sr. Environmental Planner, Environmental Engineering Specialist, Weena Dalby (949) 262-2433 and Weena.Dalby@ocwr.ocgov.com of the discovery. Do not take any photos of human remains or associated items, treat the remains with respect, and do not discuss on social media sources (i.e., Facebook, TikTok, Instagram, etc.) or other outlets, and treat the man bone or associated burial items.

If the remains are found to be Native American as defined by Health and Safety Code, Section 7050.5, the coroner will contact the NAHC by telephone within 24 hours. The NAHC shall immediately notify the person it believes to be the Most Likely Descendent (MLD) as stipulated by California PRC, Section 5097.98. The MLD(s), with the permission of the landowner and/or authorized representative, shall inspect the site of the discovered remains and recommend treatment regarding the remains and any associated grave goods. The MLD shall complete their

inspection and make their recommendations within 48 hours of notification by the NAHC. Any discovery of human remains would be treated in accordance with Section 5097.98 of the PRC and Section 7050.5 of the Health and Safety Code.

Tribal Cultural Resource Mitigation Measures

TCR-01: Should evidence of human remains be discovered during project construction, the Orange County Coroner (OCC) shall be immediately notified of the discovery. Evidence of human remains requires mandatory compliance with the provisions of State Health and Safety Code Section 7050.5, which restricts further disturbance in the vicinity of the discovery, defined herein as a 50-foot radius, until the OCC has made a determination within two business days of the origin and disposition pursuant to Public Resources Code Section 5097.98. If the remains are determined to be Native American, the OCC shall notify the Native American Heritage Commission (NAHC) within 24 hours that remains have been discovered. The NAHC shall determine the identity of the Most Likely Descendant (MLD). The MLD shall complete the inspection of the remains within 48 hours of notification by the NAHC. In addition, per CR-02, SoCalGas Project Archaeologist Ryan Glenn (425) 213-2349 (cell) and RGlenn1@scgcontractor.com or SoCalGas Archaeologist Tricia Dodds (213) 290-7449 (cell) and TDodds@socalgas.com will be notified of the discovery.

TCR-02: If unanticipated tribal cultural resources or deposits are discovered during earth-moving activities, the following measures will be implemented:

- All work will halt within a 200-foot radius of the discovery. a qualified professional archaeologist will assess the significance of the find (if a tribal cultural monitor is not present). If the resources are Native American in origin, the OCWR shall coordinate with the Tribe regarding evaluation, treatment, curation and preservation of these resources. The archaeologist will have the authority to modify the no-work radius as appropriate, using professional judgment in consultation with OCWR. Work will not continue within the no-work radius until the archaeologist conducts sufficient research, evidence and data collection to establish that the resource is either: (1) not cultural in origin; or (2) not potentially eligible for listing on the California Register of Historical Resources.

TCR-03: Tribal Cultural Resource Monitor: Prior to the issuance of any grading permit in which soil would be disturbed, Montauk shall provide evidence in the form of an executed Agreement to OCWR that they have retained a qualified Native American tribal monitor to provide third-party monitoring during excavation and grading activities and to recover and catalogue tribal resources as necessary. The tribal monitor shall be from or approved by the Kizh Nation. The agreement shall include (i) professional qualifications for the tribal cultural resource monitor(s); (ii) detailed scope of services to be provided including but not limited to pre-construction education, observation, evaluation, protection, salvage, notification, and/or curation requirements, as applicable, with final documentation/monitoring report to OCWR, as applicable; (iii) contact information; (iv) communication protocols between Contractor and Tribal

Cultural Resource Monitor; (v) acknowledgment that if the Kizh Nation monitor is not available, Montauk or their contractor as designee may contract with another qualified tribal monitor acceptable to the OCWR. The selection of the qualified professional(s) shall be subject to OCWR acceptance based on generally accepted professional qualifications and certifications, as applicable. The cover sheet of the grading plans shall include a note to identify that third party tribal monitoring is required during excavation and grading activities in accordance the with the OCWR Agreement.

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APPENDIX A

NATIVE AMERICAN HERITAGE COMMISSION SACRED LANDS FILE

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

August 21, 2023

Jenna Farrell
Tetra Tech, Inc.

Via Email to: jenna.farrell@tetratech.com

Re: Bowerman Landfill RNG Facility Project, Orange County

Dear Ms. Farrell:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Orange County
8/21/2023

Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Contact Address	Phone #	Fax #	Email Address	Cultural Affiliation	Counties	Last Updated
Gabrieleno Band of Mission Indians - Kizh Nation	N	Andrew Salas, Chairperson	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	8/18/2023
Gabrieleno Band of Mission Indians - Kizh Nation	N	Christina Swindall Martinez, Secretary	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	8/18/2023
Gabrieleno/Tongva San Gabriel Band of Mission Indians	N	Anthony Morales, Chairperson	P.O. Box 693 San Gabriel, CA, 91778	(626) 483-3564	(626) 286-1262	GTTribalcouncil@aol.com	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Ventura	
Gabrielino /Tongva Nation	N	Sandonne Goad, Chairperson	106 1/2 Judge John Aiso St., #231 Los Angeles, CA, 90012	(951) 807-0479		sgoad@gabrielino-tongva.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Ventura	3/28/2023
Gabrielino Tongva Indians of California Tribal Council	N	Robert Dorame, Chairperson	P.O. Box 490 Bellflower, CA, 90707	(562) 761-6417	(562) 761-6417	gtongva@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	3/16/2023
Gabrielino Tongva Indians of California Tribal Council	N	Christina Conley, Cultural Resource Administrator	P.O. Box 941078 Simi Valley, CA, 93094	(626) 407-8761		christina.marsden@alumni.usc.edu	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	3/16/2023
Gabrielino-Tongva Tribe	N	Sam Dunlap, Cultural Resource Director	P.O. Box 3919 Seal Beach, CA, 90740	(909) 262-9351		tongvatcr@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Ventura	5/30/2023
Gabrielino-Tongva Tribe	N	Charles Alvarez, Chairperson	23454 Vanowen Street West Hills, CA, 91307	(310) 403-6048		Chavez1956metro@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Ventura	5/30/2023
Juaneno Band of Mission Indians Acjachemen Nation - Belardes	N	Joyce Perry, Cultural Resource Director	4955 Paseo Segovia Irvine, CA, 92603	(949) 293-8522		kaamalam@gmail.com	Juaneno	Los Angeles,Orange,Riverside,San Bernardino,San Diego	3/17/2023
Juaneno Band of Mission Indians Acjachemen Nation 84A	N	Heidi Lucero, Chairperson, THPO	31411-A La Matanza Street San Juan Capistrano, CA, 92675	(562) 879-2884		jbmian.chairwoman@gmail.com	Juaneno	Los Angeles,Orange,Riverside,San Bernardino,San Diego	3/28/2023
Pala Band of Mission Indians	F	Shasta Gaughen, Tribal Historic Preservation Officer	PMB 50, 35008 Pala Temecula Road Pala, CA, 92059	(760) 891-3515	(760) 742-3189	sgaughen@palatribe.com	Cupeno Luiseno	Orange,Riverside,San Bernardino,San Diego	3/23/2023
Pala Band of Mission Indians	F	Alexis Wallick, Assistant THPO	PMB 50, 35008 Pala Temecula Road Pala, CA, 92059	(760) 891-3537		awallick@palatribe.com	Cupeno Luiseno	Orange,Riverside,San Bernardino,San Diego	3/23/2023
Santa Rosa Band of Cahuilla Indians	F	Lovina Redner, Tribal Chair	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700	(951) 659-2228	lsaul@santarosa-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	
Soboba Band of Luiseno Indians	F	Joseph Ontiveros, Tribal Historic Preservation Officer	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-5279	(951) 654-4198	jontiveros@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023
Soboba Band of Luiseno Indians	F	Jessica Valdez, Cultural Resource Specialist	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-6261	(951) 654-4198	jvaldez@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Bowerman Landfill RNG Facility Project, Orange County.

Record: PROJ-2023-004162
Report Type: List of Tribes
Counties: Orange
NAHC Group: All

APPENDIX E: HYDROLOGY AND WATER QUALITY REPORT

Geosyntec consultants

engineers | scientists | innovators

HYDROLOGY AND WATER QUALITY TECHNICAL REPORT

Bowerman Power Renewable Natural Gas Plant

Prepared for

Bowerman Power LFG, LLC
5313 Campbells Run Road, Suite 200
Pittsburgh, Pennsylvania 15205

Prepared by

Geosyntec Consultants, Inc.
3530 Hyland Avenue, Suite 100
Costa Mesa, California 92626

Project Number: HSW1898

June 5, 2024

Hydrology and Water Quality Technical Report

Bowerman Power Renewable Natural Gas Plant

Prepared for

Bowerman Power LFG, LLC
5313 Campbells Run Road, Suite 200
Pittsburgh, Pennsylvania 15205

Prepared by

Geosyntec Consultants, Inc.
3530 Hyland Avenue, Suite 100
Costa Mesa, California 92626

Julie Walters, CPSWQ, QISP, QSD
Senior Professional

Stephanie Castle Zinn, CPMSM, MURP
Senior Professional

Curtis Fang, PE
Senior Engineer

Project Number: HSW1898

June 5, 2024

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ACRONYMS AND ABBREVIATIONS

ac	Acre
AES	Advanced Engineering Software
BMP	Best management practice
cfs	Cubic feet per second
CGP	Construction General Permit
CH1	Computational Hydraulics 1
CN	Curve number
CWA	Clean Water Act
DCV	Design capture volume
DDT	Dichloro-diphenyl-trichloroethane
ft^3	Cubic feet
HCOC	Hydrologic Condition of Concern
IGP	Industrial General Permit
in	Inch
LID	Low Impact Development
min	Minute
MS4	Municipal Separate Storm Sewer System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OCFCD	Orange County Flood Control District
OCWR	Orange County Waste & Recycling
PCB	Polychlorinated biphenyl
PDP	Priority development project
RWQCB	Regional Water Quality Control Board
RNG	Renewable Natural Gas
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TGD	Technical Guidance Document
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
WQMP	Water Quality Management Plan

1. INTRODUCTION

1.1 Purpose of Report

This Hydrology and Water Quality Technical Report assesses the drainage and water quality conditions related to the Bowerman Power LFG, LLC (Bowerman Power) Renewable Natural Gas (RNG) Plant Project (Project) in support of the Mitigated Negative Declaration.

1.2 Project Overview for Hydrology and Water Quality Analyses

The analyses described herein assume the Project will disturb approximately 4.09 acres of undeveloped land within the Bowerman Power lease boundary. This includes the development of a 2.30-acre pad and the disturbance and revegetation of 1.79 acres that will remain undeveloped. Additionally, the Project will temporarily disturb approximately 0.10 acres of existing impervious area (paved access road) outside of the Bowerman Power lease area but inside of the Project Site area, and a 2.4-mile pipeline will be constructed from the future RNG Plant down Bee Canyon Access Road to the corner of Portola Parkway and Jeffery Road.

As the proposed Project is anticipated to convert approximately 1.38 acres of undeveloped land to impervious surfaces, water quality, hydromodification, and hydrology assessments have been performed at a conceptual level to inform the stormwater management design.

1.3 Report Structure

This report is organized into the following sections:

- Section 2, "Environmental Setting," describes the existing environmental conditions of the Project, as relevant to the site hydrology and water quality.
- Section 3, "Regulatory Drivers," presents an overview of the regulatory settings as they relate to potential water quality, hydromodification, and hydrology considerations for the overall Project design.
- Section 4, "Hydrology & Water Quality Analysis," summarizes the hydrology and water quality-specific assessments performed as part of this report at a conceptual level.

Conclusions, references, tables, figures, and appendices are presented at the end of the report.

2. ENVIRONMENTAL SETTING

This section describes the existing environmental conditions of the Project, as relevant to the site hydrology and water quality.

2.1 Regional Watershed

As shown in Figure 1, the Project is located within the San Diego Creek watershed, a heavily urbanized, 112-square mile (71,680-acre) watershed that drains to Upper Newport Bay. The watershed is bounded by Loma Ridge to the north, the Santa Ana River to the west, Aliso Creek and Laguna Canyon Creek to the southeast, and the San Joaquin Hills to the south. Elevations at Loma Ridge range from approximately 1,000 to 2,000 feet and elevations of the low San Joaquin Hills range from approximately 400 to 600 feet. The watershed falls under the jurisdiction of the Santa Ana Regional Water Quality Control Board (RWQCB), a division of the State Water Resources Control Board (SWRCB).

2.2 Project Drainage Conditions

The Project proximity drainage condition is shown in Figure 2. Stormwater runoff from the proposed RNG Plant and adjacent slope areas, as well as a portion of the runoff that will be associated with pipeline construction, discharges directly to a concrete open channel where it comingles with landfill runoff. Comingled runoff is contained in a concrete sedimentation basin that is owned, operated, and maintained by Orange County Waste & Recycling (OCWR) then discharges to the Bee Canyon Retarding Basin, which is owned and operated by the Orange County Flood Control District (OCFCD), via Bee Canyon Wash. Bee Canyon Wash is a tributary of San Diego Creek Reach 1, which ultimately drains to the Upper Newport Bay. Stormwater runoff associated with pipeline construction that is not directed to the landfill sedimentation basin and Bee Canyon Retarding Basin is anticipated to comingle with runoff from Bee Canyon Access Road and drain to open space, East Hicks Retarding Basin, and/or different components of the County of Orange or City of Irvine Municipal Separate Storm Sewer System (MS4).

2.3 Pollutants of Concern

Pollutants of concern that may be generated during Project construction and potentially cause or contribute to water quality impairments include the following:

- *Oil and Gas* – Spills from oil and gas contain hydrocarbons, heavy metals, salts, and other toxic chemicals, which have the potential to impair soils, vegetation, and groundwater. Oil and gas pollution can result from various activities, such as vehicle maintenance operations and equipment or vehicle fueling.
- *Total Suspended Solids (TSS)/Sediment* – Excessive erosion, transport, and deposition of sediment in surface waters can impair aquatic life by covering spawning gravels, impairing fish food sources, filling rearing pools, and reducing other beneficial habitat in stream channels.
- *Trash and Debris* – Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic debris (such as cleared vegetation and food waste) are general waste products on the landscape that can be entrained in runoff. The presence of trash and debris may have a significant impact on the recreational value of a water body

and aquatic habitat. Excess organic matter in runoff can create a high oxygen demand in a stream and thereby lower its water quality.

- *Trace Metals (Copper, Lead, Zinc, and Iron)* – Copper, lead, and zinc are the most prevalent heavy metals typically found in urban runoff and are of concern because of their potentially toxic effects on aquatic life. The primary anthropogenic sources copper, lead, and zinc in stormwater are commercially available metals used in transportation, buildings, and infrastructure but they are also found in fuels, adhesives, paints, and other coatings. Iron is naturally abundant in local geologic formations (i.e., in soil) and can be associated with heavy machinery used for earth moving (i.e., grading) activities; however, iron is not typically considered a heavy metal with the potential to bioaccumulate in fish and shellfish and affect beneficial uses of a waterbody.

3. REGULATORY DRIVERS

This section presents an overview of the regulatory settings as they relate to potential water quality, hydromodification, and hydrology considerations for the Project.

3.1 Federal Legislation

3.1.1 Clean Water Act

In 1987, the federal Clean Water Act (CWA) was amended to require that the United States Environmental Protection Agency (USEPA) establish regulations for permitting of municipal, construction, and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) permit program (USEPA, 1987). The USEPA published final regulations regarding stormwater discharges on November 16, 1990. The regulations require that MS4 discharges and discharges of stormwater associated with land disturbance and industrial activities to surface waters be regulated by an NPDES permit.

It is anticipated that the Project will be subject to NPDES permitting during and after construction. It is also located in a large (Phase I) MS4 area with requirements relating to post-construction hydrology and water quality, as discussed later in this section.

3.1.2 Clean Water Act Section 303(d) and Total Maximum Daily Loads

Water bodies not meeting water quality standards are deemed "impaired" and, under CWA Section 303(d), are placed on a list of impaired waters for which a Total Maximum Daily Load (TMDL) must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, nonpoint, and natural sources that a water body may receive without exceeding applicable water quality standards (with a "factor of safety" included). For point sources, including stormwater, the load allocation is referred to as a "Waste Load Allocation," whereas for nonpoint sources, the allocation is referred to simply as a "Load Allocation." Once established, the TMDL allocates the loads (or concentrations) among current and future pollutant sources to the waterbody.

Sections 303(d) and 305(b) of the CWA require that the SWRCB and RWQCBs conduct Water Quality Assessments that address the condition of surface waters and submit a list of impaired waters to the USEPA for review and approval. A report integrating the requirements of these two CWA sections is referred to as an Integrated Report. The 2020-2022 Integrated Report and updated 303(d) list were approved by the SWRCB on January 19, 2022, and by the USEPA on May 11, 2022 (SWRCB, 2022a).

According to the CWA Section 303(d) list issued by the SWRCB, San Diego Creek Reaches 1 and 2 and Upper Newport Bay are impaired water bodies for sedimentation/siltation, nutrients, indicator bacteria, benthic community effects, selenium, toxaphene, dichloro-diphenyl-trichloroethane (DDT), malathion, polychlorinated biphenyls (PCBs), toxicity and chlordane. Of those listed pollutants, USEPA-approved TMDLs exist for sedimentation/siltation, nutrients, toxaphene, DDT, PCBs, and chlordane.

3.2 Statewide General Permits

3.2.1 Construction General Permit

The SWRCB reissued the statewide NPDES General Permit for Stormwater Discharges Associated with Construction Activity (Construction General Permit) (Order No. 2022-0057-DWQ, NPDES No. CAR000002) on September 8, 2022 (SWRCB, 2022b). Under this Construction General Permit (CGP), effective September 1, 2023, discharges of stormwater from construction sites with a disturbed area of one or more acres must be covered under an individual NPDES permit or the CGP. Coverage under the CGP is accomplished by completing a Notice of Intent (NOI) that includes a construction site risk calculation to determine appropriate coverage level; preparing a Stormwater Pollution Prevention Plan (SWPPP), complete with site maps, a Construction Site Monitoring Program, and sediment basin design calculations (if applicable); and supporting documentation for compliance with existing permitted Phase I or Phase II MS4 post-construction requirements or the post-construction standards of the CGP.

Because the anticipated areas of disturbance are separate under each phase of the Project (i.e., disturbance related to the RNG Pad and pipeline construction), each phase sponsor will be seeking coverage under the CGP separately and will comply with the requirements relating to hydrology and water quality therein.

3.2.2 Industrial General Permit

The SWRCB adopted an amendment to the statewide NPDES General Permit for Stormwater Discharges Associated with Industrial Activity (Industrial General Permit) (Order 2014-0057-DWQ as Amended in 2015 and 2018, NPDES No. CAS000001) on November 6, 2018 (SWRCB, 2018). Under this Industrial General Permit (IGP), effective July 1, 2020, discharges of stormwater from industrial sites with exposed industrial activities must be covered under an individual NPDES permit or the IGP. Coverage under the IGP is accomplished by completing an NOI that includes a SWPPP and monitoring implementation plan, site maps, and water quality best management practice (BMP) design calculations (if applicable).

The Bowerman Power Landfill Gas to Energy Plant currently has coverage under the IGP. Coverage will be amended to incorporate the RNG Plant upon completion of construction and commissioning.

3.3 County-Specific Regulations and Guidelines

3.3.1 North Orange County Municipal Separate Storm Sewer System Permit

Waste discharge requirements for urban stormwater runoff apply throughout Orange County. The MS4 Permit regulates discharges of stormwater from public storm drains. Separate MS4 Permits exist for the northern and southern areas of the county. For North Orange County, where the Project is located, the MS4 Permittees include the County of Orange, OCFCD, and incorporated cities (see Order No. R8-2009-0030 as amended by Order No. R8-2010-0062, NPDES No. CAS618030) (SARWQCB, 2009).

The Permittees have developed a Model Water Quality Management Plan (WQMP) (OCPW, 2011) and Technical Guidance Document (TGD) (OCPW, 2013) in accordance with the new development/significant redevelopment requirements of the MS4 Permit These documents include guidance for the preparation of conceptual or preliminary WQMPs to more effectively ensure that

water quality protection is considered in the earliest phases of a project. They address Low Impact Development (LID) principles and provide information on BMPs. The latter discussion clarifies BMP effectiveness and applicability to new development or significant redevelopment as defined in the MS4 Permit.

In general, a WQMP is required for projects that qualify as a priority development project (PDP). In North Orange County, new development qualifies as a PDP if it creates 10,000 or more square feet of impervious surface. As the Project exceeds the impervious surface threshold, a WQMP will be required as part of the final engineering design.

3.3.1.1 Low Impact Development Provisions

The MS4 Permit and associated guidance documents, including the Model WQMP and TGD, require that the design for a PDP incorporates new LID provisions and addresses the impact of development on downstream hydrology. PDP design for stormwater management must infiltrate, harvest and reuse, or biotreat the "design capture volume" (DCV) associated with the 85th percentile, 24-hour storm event. This is equivalent to the retention or treatment of 80 percent of the average annual runoff volume. Biotreatment may be considered only if infiltration and/or harvest and reuse cannot be feasibly implemented at a project site. Any portion of the DCV that is not infiltrated, harvested and reused, or biotreated by LID BMPs on the project site must be treated and discharged per specific conditions of the permit.

According to the requirements of the MS4 Permit, the Project triggers LID requirements and therefore a site-specific BMP will be required to manage the runoff volume from the 85th percentile, 24-hour storm event[1]. As infiltration is infeasible due to landfill operations and there is insufficient on-site demand for harvest and reuse, a biotreatment basin is proposed as the site-specific BMP for the Project and is described in Section 4.

3.3.1.2 Hydromodification Control

The MS4 Permit also requires Project sponsors or designers to identify Hydrologic Conditions of Concern (HCOCs) associated with the project. Such conditions occur when there is a potential for increased runoff that can cause significant impacts on downstream channels and aquatic habitats, alone or in conjunction with impacts of other projects. Such impacts are termed hydromodification, and they are defined as the alteration of natural flow characteristics and sediment supply in streams and channels due to urbanization. If HCOCs are identified, the project must implement BMPs to mitigate hydromodification. Specifically, for North Orange County, the project must implement on-site or regional hydromodification controls such that:

1. The post-development runoff volume for the 2-year, 24-hour storm event does not exceed that of the pre-development condition by more than five percent, and
2. Time of concentration (i.e., the time required for runoff to travel from the hydraulically most distant point in a drainage area to the outlet) of post-development runoff for the

[1] The 85th percentile, 24-hour storm event is a statistical design storm defined through a hydrologic analysis of long-term rainfall records for a particular geographic area. At the most basic level, the design storm represents the 85th percentile, 24-hour rainfall depth (measured in inches of rain) among all 24-hour rainfall depths evaluated in the historical record (LARWQCB, 2021). The 85th percentile 24-hour storm depth within Orange County is published in the Technical Guidance Document (OCPW, 2013).

2-year, 24-hour storm event is not less than that for the pre-development condition by more than five percent.

HCOCs are assessed in Section 4 to determine if Items 1 and 2 above are identified as applicable.

3.3.2 Orange County Hydrology Manual

The 1986 Orange County Hydrology Manual and its 1996 Addendum provide guidance for estimating peak discharge rates and runoff volumes for flood control purposes (OCEMA, 1996). Precipitation data used in designing local drainage facilities for runoff mitigation are provided for the 2-, 10-, 25-, and 100-year, 24-hour duration storm events.

As the Project may be subject to flood control criteria, the aforementioned storm events for local drainage facility design are included in the hydrologic analysis detailed in Section 4.

4. HYDROLOGY & WATER QUALITY ANALYSES

This section summarizes the hydrology and water quality assessments performed at a conceptual level as part of this report. As discussed below, additional studies may be conducted to confirm conceptual assumptions and calculations during final engineering design.

4.1 Hydrology Analysis

4.1.1 Overview

The hydrology analysis detailed in this section describes the anticipated long-term changes to time of concentration, total volume, and peak flow of stormwater runoff resulting from completion of the Project and assumes the following:

1. Runoff from the RNG Plant pad (approximately 2.30 acres) will be treated by the LID BMP constructed at the RNG Plant.
2. Approximately 1.34 acres of land upslope of the RNG Plant pad, both inside and outside of the Project Site area, will be disturbed and replanted to meet local fire fuel vegetation management guidelines but will not otherwise be developed. Therefore, no increase in imperviousness will be made in this area. Run-on to the RNG Plant pad from this area will be routed to a proposed perimeter v-ditch and bypass the LID BMP. Additional measures necessary to address alterations in hydrology and water quality due to runoff originating in this area during the period of disturbance will be addressed in the construction phase SWPPP (See Section 4.2.1).
3. Run-on from approximately 0.33 acres of undisturbed land upslope of the RNG Plant pad, outside of the Project Site area, will be routed to a proposed perimeter v-ditch and bypass the LID BMP.
4. Approximately 0.45 acres of land downslope of the RNG Plant pad, inside of the Project Site area, will be disturbed, regraded, and revegetated but will not otherwise be developed. Therefore, no increase in imperviousness will be made in this area. Runoff from this area will continue to flow similar to existing conditions. Additional measures necessary to address alterations in hydrology and water quality due to runoff originating in this area during the period of disturbance will be addressed in the construction phase SWPPP (See Section 4.2.1).
5. No changes will be made to existing impervious areas outside of the RNG Plant pad. Runoff will continue to follow existing drainage patterns.

The hydrology analysis was conducted with regards to the 2.30-acre RNG Plant pad. Time of concentration calculations and other hydrology analyses are not provided for up- or down-slope areas, as the net change in runoff volume is anticipated to be zero from existing to proposed conditions.

4.1.2 Existing vs. Proposed Conditions

Under existing (pre-development) conditions, the 2.30-acre drainage area to be served by the LID BMP consists primarily of pervious, vegetated area that is considered open brush in good condition (CN 81; more than 70% of the ground surface protected by vegetation). As illustrated on Figure 3, a small portion of the area consists of an impervious concrete drainage control channel (CN 98)

that was constructed and is currently maintained by OCWR. Under proposed (post-development) conditions, a section of the existing open brush area will be paved to facilitate access to the RNG Plant. As illustrated on Figure 4, various concrete pads will also be installed to house equipment. Approximately 60% (1.38 acres) of the LID BMP drainage area will be impervious (CN 98), while the remaining areas will be considered pervious barren graded land (CN 93). The resulting change in time of concentration from pre- to post-development condition for the LID BMP drainage area is summarized in Table 1.

Table 1: LID BMP Drainage Area Under Existing and Proposed Conditions

Condition	Total Area (ac)	Impervious / Paved Area (ac) (CN 98)	Barren Graded Land (ac) (CN 93)	Open Brush (ac) (CN 81)	Time of Concentration (min)
Existing	2.30	0.03	0	2.27	16.5
Proposed	2.30	1.38	0.92	0	11

ac: acres
min: minutes

4.1.3 Model Results

The precipitation data used for the storm events included in the analysis were determined from the Orange County Hydrology Manual. All storms followed a Type I rainfall distribution. The 24-hour rainfall depths used for the 2-year, 10-year, 25-year, and 100-year storms were 2.05, 3.68, 4.49, and 5.63 inches, respectively. Hydromodification considerations are determined based on the 2-year, 24-hour storm, while potential flood control design is determined based on the 10-year, 25-year, and 100-year, 24-hour storms. While design storms for flood control are analyzed in this report, any flood control requirements will be addressed as part of the final engineering design.

As requested by Orange County Public Works, the hydrology analysis was performed using the Computational Hydraulics 1 (CH1) module of Advanced Engineering Software (AES). The CH1 module of AES uses the small area unit hydrograph method to determine the peak flow rate and volume generated by the specified design storms. The results from the model, as well as the nomographs from the Orange County Hydrology Manual used to determine the existing and proposed times of concentration, are included in Appendix A. The model output is summarized below in Table 2.

Table 2: Summary of Hydrology Analysis

Storm Event	Existing Conditions		Proposed Conditions		Increase	
	Runoff Volume (ft^3)	Peak Flow (cfs)	Runoff Volume (ft^3)	Peak Flow (cfs)	Runoff Volume (ft^3)	Peak Flow (cfs)
2-year, 24-hour	5,663	1.93	12,197	2.81	+6,534	+0.88
10-year, 24-hour	15,246	3.81	24,394	5.18	+9,148	+1.37
25-year, 24-hour	20,909	4.64	30,492	6.19	+9,583	+1.55

Storm Event	Existing Conditions		Proposed Conditions		Increase	
	Runoff Volume (ft^3)	Peak Flow (cfs)	Runoff Volume (ft^3)	Peak Flow (cfs)	Runoff Volume (ft^3)	Peak Flow (cfs)
100-year, 24-hour	28,750	6.00	38,768	7.97	+10,019	+1.97

ft^3: cubic feet
cfs: cubic feet per second

Project conditions are expected to increase both the volume and peak flow of stormwater runoff (see Table 2) and decrease the time of concentration (see Table 1). Therefore, on-site hydromodification and flood control may be required. Alternatively, as per discussion with Orange County Public Works staff on June 22, 2023, calculations demonstrating adequate capacity within the downstream OCFCD-owned Bee Canyon Retarding Basin to support the increased discharge may be a viable option in lieu of on-site detention. Calculations for this alternative to manage post-development runoff may be provided as part of the final engineering design. If using Bee Canyon Retarding Basin is determined to be infeasible, on-site detention would be provided as part of the final engineering design.

4.2 Water Quality Analysis

To satisfy water quality requirements, BMPs must be proposed and implemented during both the construction phase and for the long-term operation of the Project. These are summarized below at the conceptual level. Site-specific BMPs for the construction phase will be specified within the future RNG Pad and SoCal Gas Pipeline construction SWPPPs to be prepared by Bowerman Power and SoCal Gas, respectively. Site-specific operational phase BMPs will be specified in the WQMP and RNG Facility industrial SWPPP documents prepared by Bowerman Power.

4.2.1 Construction Phase

Project construction activities will be carried out in accordance with the requirements of the CGP. At a minimum, BMP implementation may include perimeter controls (e.g., silt fence), sediment controls to minimize tracking (e.g., rumble strips at the entrance of the work zone), and wind erosion controls (e.g., watering for dust) as applicable by Project phase. Access roads leading into and out of Project areas will be swept. Future, phase specific SWPPPs will designate site-specific BMPs to be implemented during the RNG Plant and pipeline construction phases of the Project. The Project will remain covered under the CGP until the requirements for Notice of Termination have been met.

4.2.2 Operational Phase

4.2.2.1 Water Quality Management Plan

Drainage conditions under the operational phase are described in detail in Section 4.1. As discussed previously, the Project is located within the Frank R. Bowerman Landfill and discharges to a concrete-lined sedimentation basin managed by OCWR. It also triggers LID BMP requirements. The landfill sedimentation basin does not serve as an LID facility for the Project; therefore, additional BMPs are required to meet the Orange County MS4 Permit LID provisions.

Proposed BMPs must follow the design guidance contained in the TGD to meet water quality requirements. Per the LID BMP selection flow chart, proposed BMPs must assess, in order of

priority, the feasibility of infiltration, harvest and reuse, and biotreatment. It is anticipated that infiltration will not be feasible due to landfill operations and that there is inadequate demand for a harvest and reuse system. Therefore, a biotreatment BMP with an underdrain will be proposed.

To determine the sizing of the biotreatment BMP, the DCV for the water quality storm event (85th percentile, 24-hour storm) was calculated using the Simple Method defined in the TGD. The equation for the Simple Method is shown below (V provides an approximation of DCV):

$$V = C \times d \times A \times 43560 \frac{ft^2}{ac} \times \frac{1ft}{12in}$$

Where:

V = runoff volume during the design storm event (cubic feet)
C = runoff coefficient = (0.75 × *imp* + 0.15) = 0.601
imp = impervious fraction of drainage area (0.601)
d = storm depth (0.87 inches, from TGD Rainfall Zones figure)
A = tributary area (2.30 acres)

Project DCV = 4,355 cubic feet

Using the Simple Method, the runoff volume during the 85th percentile, 24-hour storm event is calculated at 4,355 cubic feet. Based on this value for the DCV and the runoff volumes for the existing and proposed conditions in Section 4.1.3, the sizing of the biotreatment BMP will be governed by the 2-year, 24-hour storm event. This is specified by hydromodification criteria, since the difference in the existing and proposed 2-year, 24-hour volumes (6,534 cubic feet) is greater than the DCV (4,355 cubic feet).

Following the TGD, approximate dimensions for the BMP were determined from 2-year, 24-hour volumes. The recommended BMP is a bioretention basin with underdrain and a minimum media layer area of 1,815 square feet with an effective depth of 3.6 feet which assumes a ponding depth of three feet (with a fence) and a media depth of three feet (assuming 20% porosity). It is currently assumed that the bioretention basin with underdrain would be designed with straight concrete walls and no side slopes. The proposed location of the basin is shown on Figure 4. The design of the BMP at the time of this report is subject to change per the Final WQMP to be submitted as part of the final engineering design for the project.

4.2.2.2 Industrial Stormwater Pollution Prevention Plan

Operational phase activities at the RNG Plant will be carried out in accordance with the requirements of the IGP. At a minimum, BMP implementation will include the seven minimum BMPs:

1. Good housekeeping
2. Preventative maintenance
3. Spill and leak response
4. Material handling and waste management
5. Erosion and sediment control

6. Employee training
7. Quality assurance/quality control

Advanced BMPs are not required to be implemented under the IGP; however, the BMP recommended to satisfy the MS4 Permit requirements (bioretention basin with underdrain) will be incorporated as an advanced BMP in the RNG Facility SWPPP.

Natural gas transmission pipelines are categorized under Standard Industrial Classification (SIC) Code 4922 (OMB, 1997) which is not subject to the IGP according to Attachment A of the Permit (SWRCB, 2018); therefore, a separate SWPPP will not be prepared to cover routine pipeline operations and the pipeline will not be incorporated in to the RNG Facility SWPPP.

5. CONCLUSIONS

The proposed project will increase stormwater runoff flow rates and volumes as compared to the existing condition where flood control, hydromodification, and LID design criteria will be required. As part of final engineering, the Project will follow specified design criteria within the requirements of the MS4 Permit and Orange County Hydrology Manual. As a result, no impacts to downstream drainage or water quality are anticipated.

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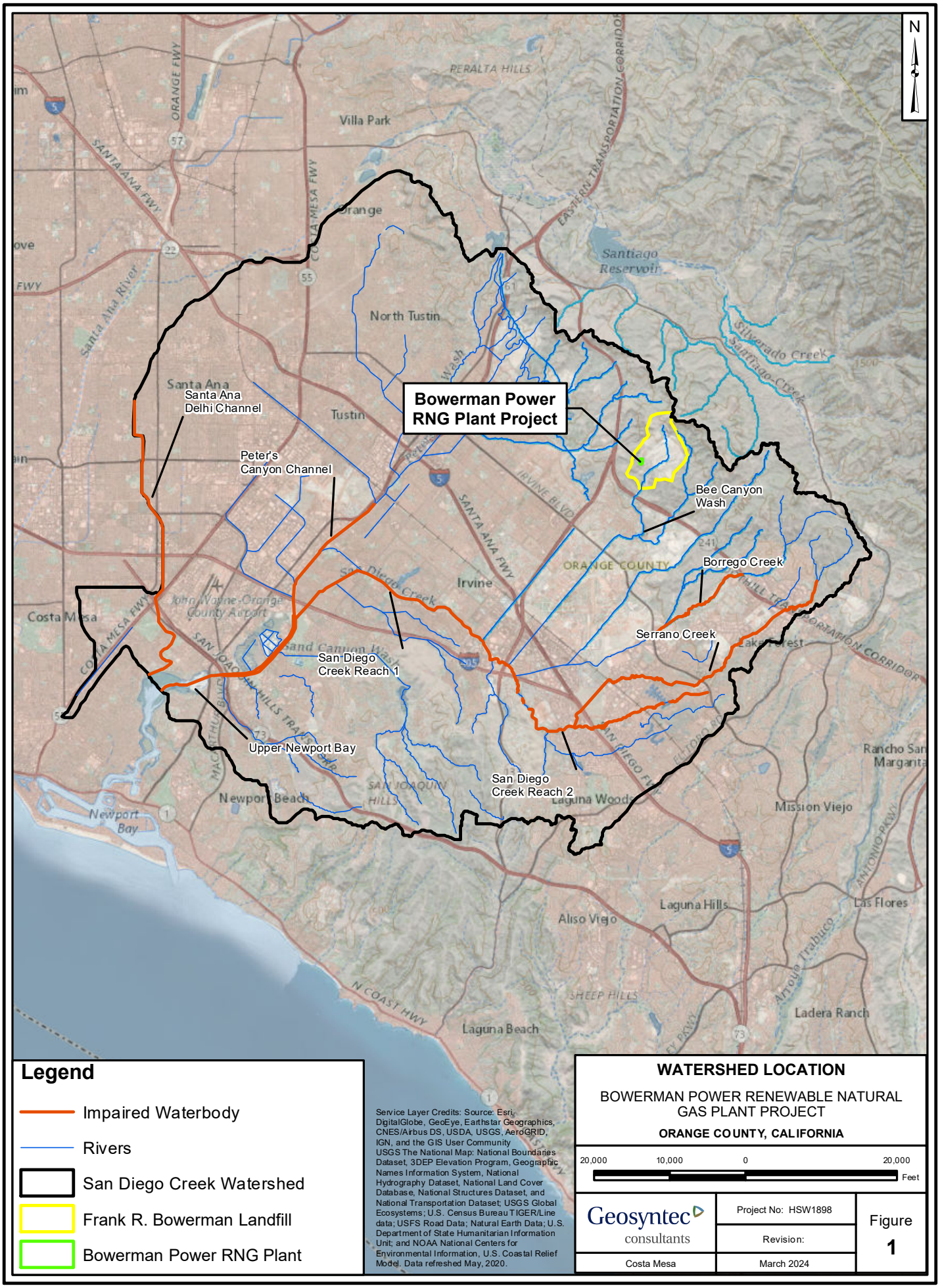
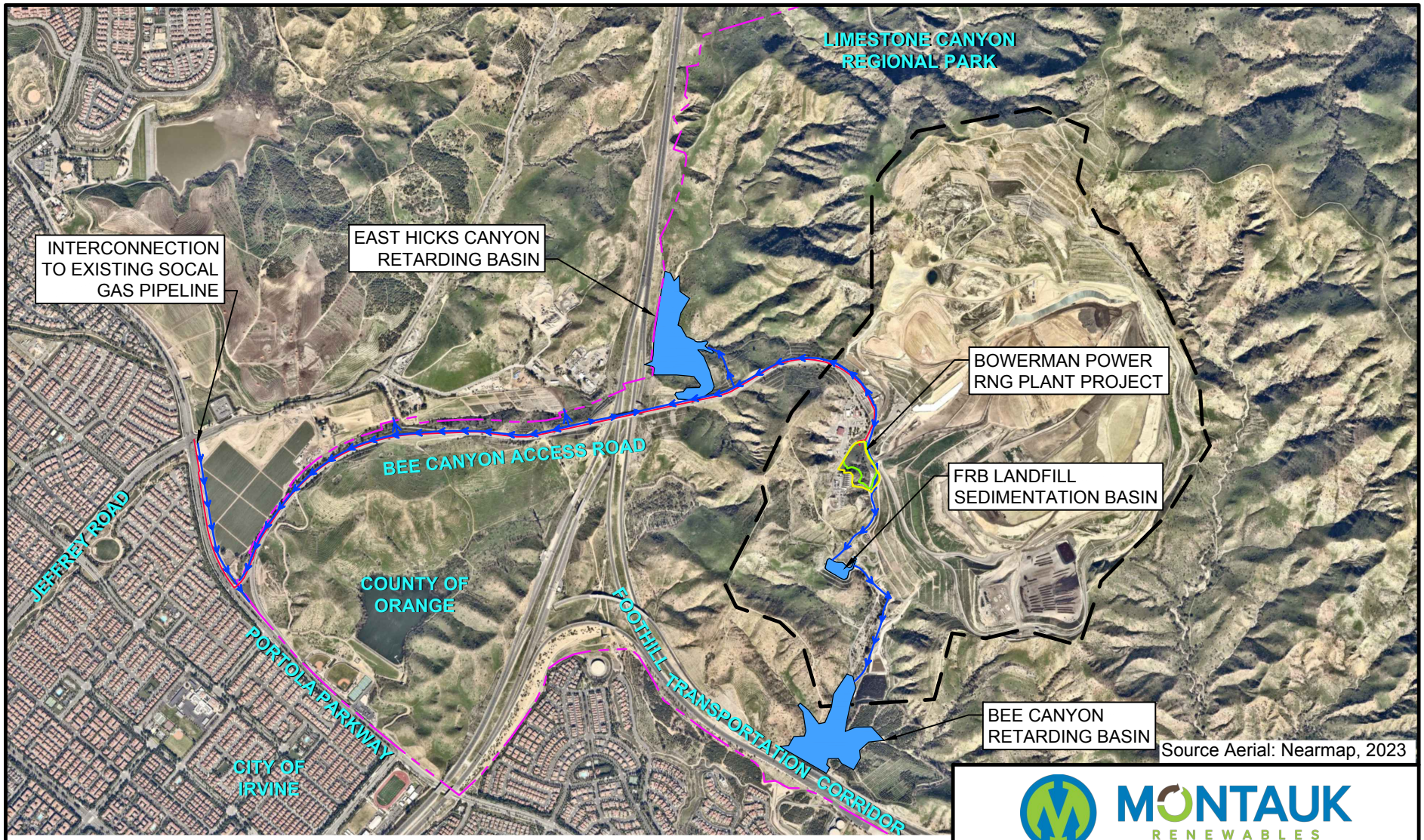
FIGURES


N
Bowerman Power RNG Plant Project
Santa Ana Delhi Channel
Peter's Canyon Channel
Bee Canyon Wash
Borrego Creek
Serrano Creek
San Diego Creek Reach 1
San Diego Creek Reach 2
Upper Newport Bay
Villa Park
Orange
North Tustin
Santa Ana
Tustin
Irvine
Costa Mesa
Newport Beach
Laguna Woods
Laguna Hills
Aliso Viejo
Laguna Beach
Mission Viejo
Ladera Ranch
Las Flores
Rancho San Margarita
Santiago Reservoir
Peralta Hills
Sheep Hills
Legend
Impaired Waterbody
Rivers
San Diego Creek Watershed
Frank R. Bowerman Landfill
Bowerman Power RNG Plant
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed May, 2020.
WATERSHED LOCATION
BOWERMAN POWER RENEWABLE NATURAL GAS PLANT PROJECT
ORANGE COUNTY, CALIFORNIA
20,000 10,000 0 20,000
Feet
Geosyntec consultants
Project No: HSW1898
Revision:
Figure 1
Costa Mesa
March 2024



LEGEND

- LEASE BOUNDARY
- PROJECT SITE
- PIPELINE ROUTE
- JURISDICTIONAL BOUNDARY
- SURFACE FLOW DIRECTION
- FRANK R. BOWERMAN LANDFILL
- WATER QUALITY BASIN

N

0 2000'

MONTAUK RENEWABLES

PROJECT DRAINAGE

BOWERMAN POWER RENEWABLE NATURAL GAS PLANT PROJECT

Geosyntec consultants

FIGURE 2

PROJECT NO: HSW1898 | MARCH 2024

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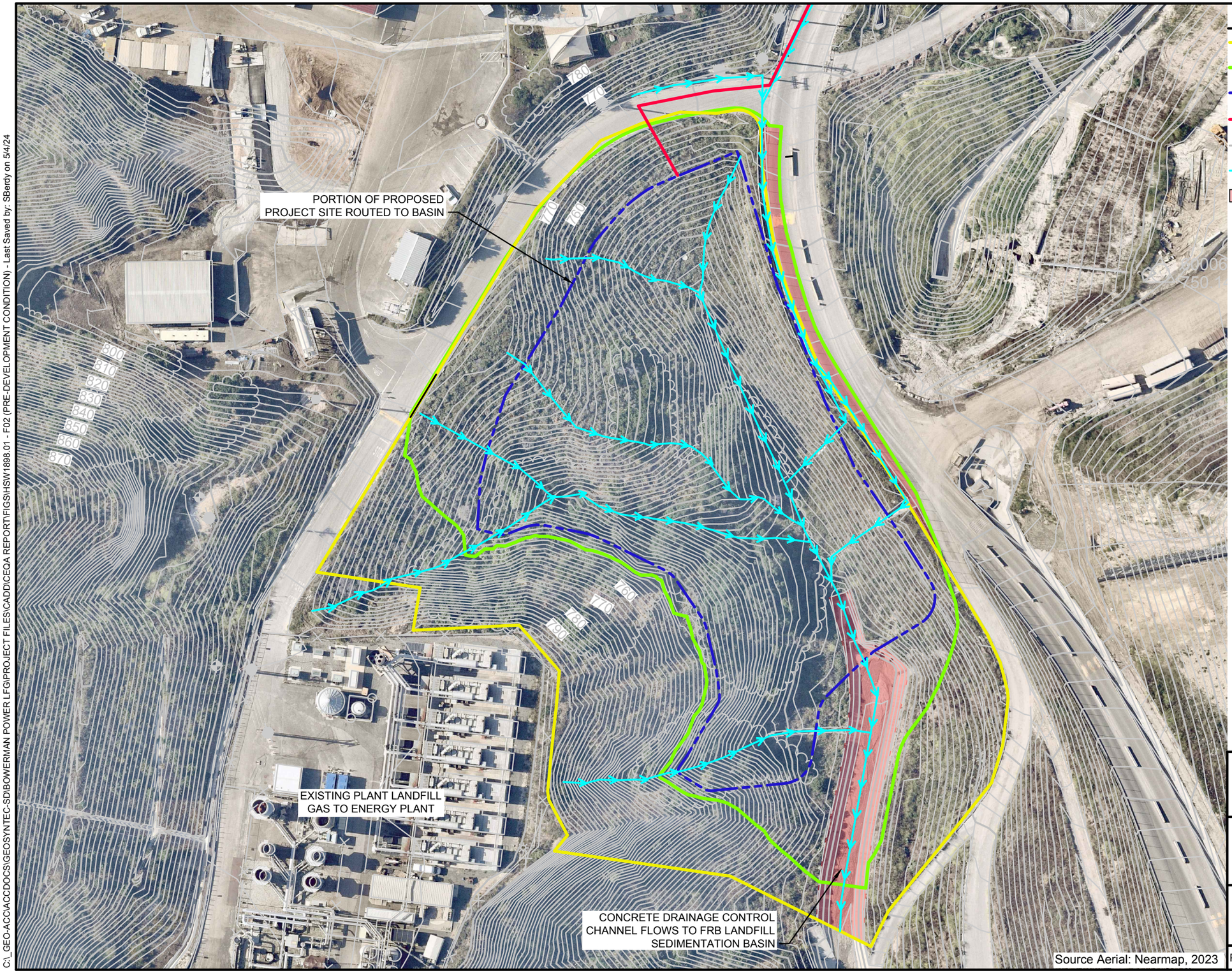
pw:\\geosyntec-pw.bentley.com:geosyntec-pw-01\Documents\Clients\B\BOWERMAN POWER LFG LLC\HSW1898 - BOWERMAN POWER RNG PLANT EXPANSION\CADD\01 - CEQA REPORT\FIGURES\



LEGEND

- LEASE BOUNDARY
- PROJECT SITE
- BASIN DRAINAGE AREA (2.30 ACRES)
- PIPELINE ROUTE
- 800 — EXISTING GROUND MAJOR CONTOUR (10')
- SURFACE FLOW DIRECTION
- EXISTING IMPERVIOUS AREA

N

0 80'

MONTAUK RENEWABLES

PRE-DEVELOPMENT CONDITION
BOWERMAN POWER RENEWABLE
NATURAL GAS PLANT PROJECT

Geosyntec consultants

FIGURE 3

PROJECT NO: HSW1898 | MAY 2024

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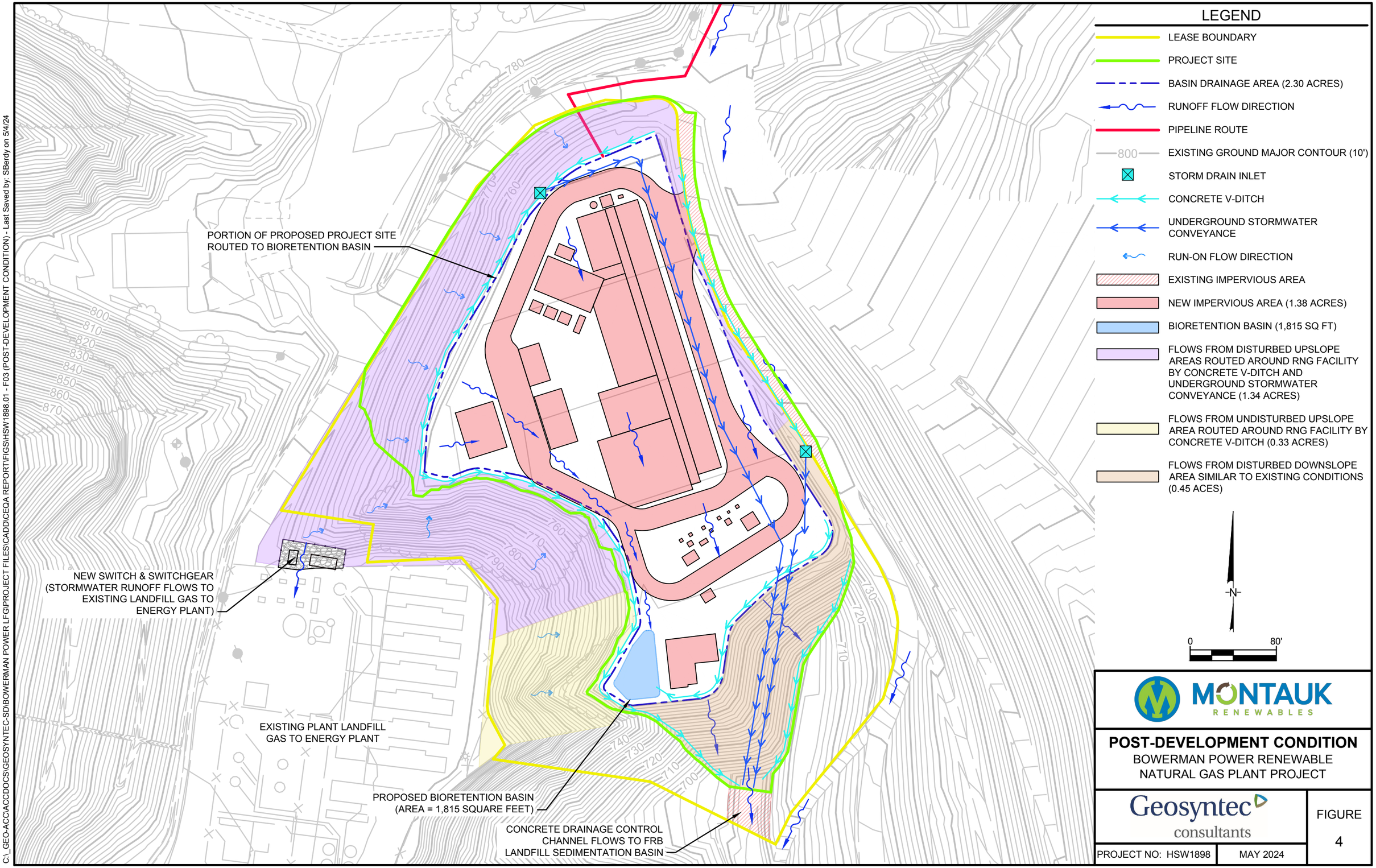

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MONTAUK RENEWABLES

POST-DEVELOPMENT CONDITION
BOWERMAN POWER RENEWABLE
NATURAL GAS PLANT PROJECT

Geosyntec consultants

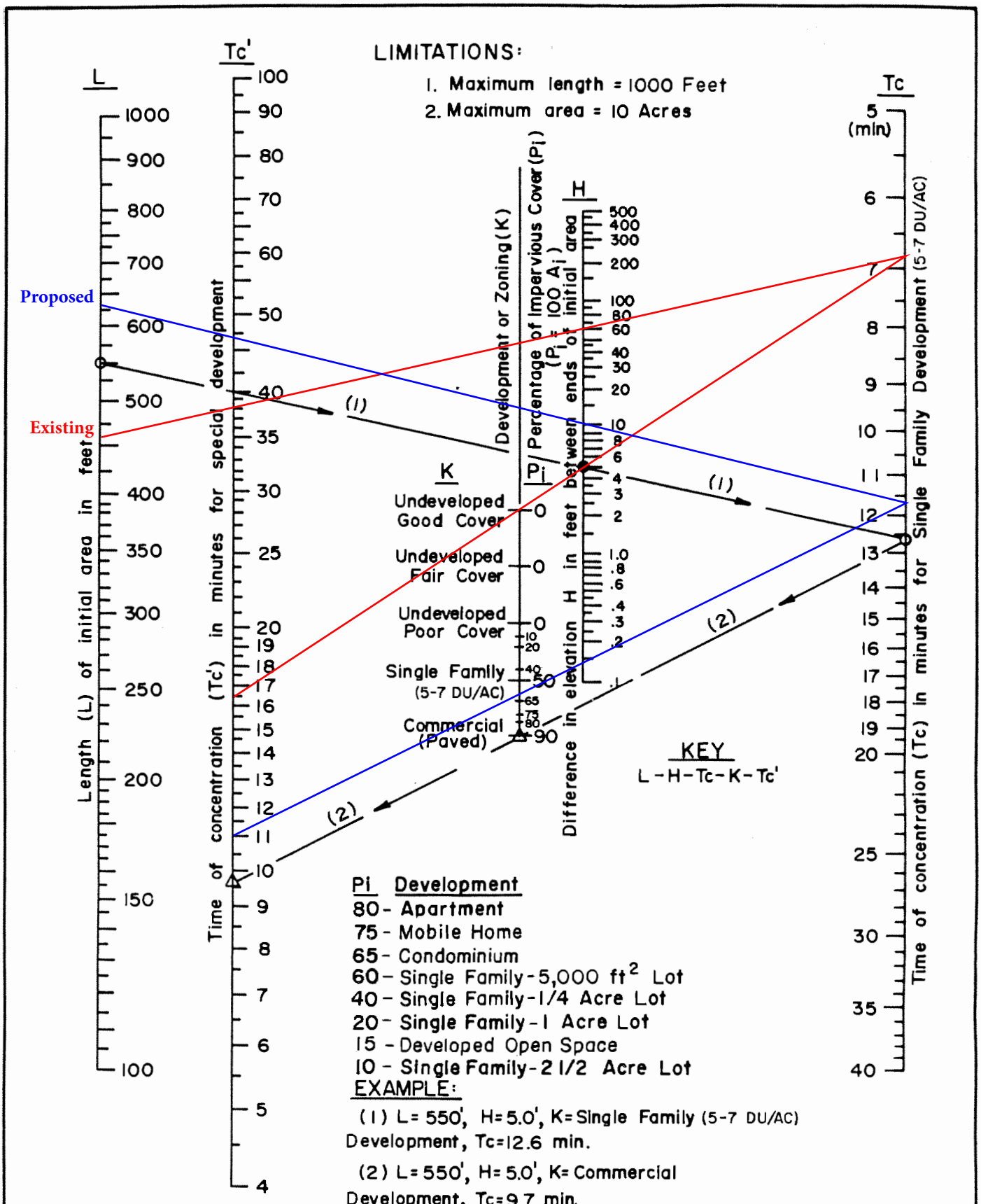
PROJECT NO: HSW1898 | MAY 2024

FIGURE
4

Geosyntec consultants

APPENDIX A

Orange County Hydrology Manual Time of Concentration Nomograph & AES Hydrology Analysis Output



ORANGE COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

2-YEAR, 24-HOUR: EXISTING CONDITIONS

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 2.30
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.200
LOW LOSS FRACTION = 0.710
TIME OF CONCENTRATION(MIN.) = 16.50
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 2
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.19
30-MINUTE POINT RAINFALL VALUE(INCHES) = 0.40
1-HOUR POINT RAINFALL VALUE(INCHES) = 0.53
3-HOUR POINT RAINFALL VALUE(INCHES) = 0.89
6-HOUR POINT RAINFALL VALUE(INCHES) = 1.22
24-HOUR POINT RAINFALL VALUE(INCHES) = 2.05

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.13
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.26

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.05	0.0000	0.00	Q	.	.	.	.
0.32	0.0002	0.02	Q	.	.	.	.
0.60	0.0007	0.02	Q	.	.	.	.
0.88	0.0011	0.02	Q	.	.	.	.
1.15	0.0016	0.02	Q	.	.	.	.
1.42	0.0020	0.02	Q	.	.	.	.
1.70	0.0025	0.02	Q	.	.	.	.
1.98	0.0029	0.02	Q	.	.	.	.
2.25	0.0034	0.02	Q	.	.	.	.
2.53	0.0039	0.02	Q	.	.	.	.
2.80	0.0044	0.02	Q	.	.	.	.
3.08	0.0049	0.02	Q	.	.	.	.
3.35	0.0054	0.02	Q	.	.	.	.
3.62	0.0059	0.02	Q	.	.	.	.
3.90	0.0064	0.02	Q	.	.	.	.
4.18	0.0069	0.02	Q	.	.	.	.
4.45	0.0074	0.02	Q	.	.	.	.
4.72	0.0079	0.02	Q	.	.	.	.
5.00	0.0085	0.02	Q	.	.	.	.
5.28	0.0090	0.02	Q	.	.	.	.
5.55	0.0096	0.02	Q	.	.	.	.
5.82	0.0102	0.03	Q	.	.	.	.
6.10	0.0107	0.03	Q	.	.	.	.

6.38	0.0113	0.03	Q	.	.	.	.
6.65	0.0119	0.03	Q	.	.	.	.
6.93	0.0125	0.03	Q	.	.	.	.
7.20	0.0131	0.03	Q	.	.	.	.
7.47	0.0138	0.03	Q	.	.	.	.
7.75	0.0144	0.03	Q	.	.	.	.
8.02	0.0151	0.03	Q	.	.	.	.
8.30	0.0157	0.03	Q	.	.	.	.
8.57	0.0164	0.03	Q	.	.	.	.
8.85	0.0171	0.03	Q	.	.	.	.
9.12	0.0178	0.03	Q	.	.	.	.
9.40	0.0186	0.03	Q	.	.	.	.
9.68	0.0193	0.03	Q	.	.	.	.
9.95	0.0201	0.03	Q	.	.	.	.
10.23	0.0209	0.04	Q	.	.	.	.
10.50	0.0217	0.04	Q	.	.	.	.
10.77	0.0226	0.04	Q	.	.	.	.
11.05	0.0234	0.04	Q	.	.	.	.
11.32	0.0243	0.04	Q	.	.	.	.
11.60	0.0253	0.04	Q	.	.	.	.
11.88	0.0262	0.04	Q	.	.	.	.
12.15	0.0272	0.04	Q	.	.	.	.
12.43	0.0284	0.06	Q	.	.	.	.
12.70	0.0297	0.06	Q	.	.	.	.
12.98	0.0311	0.06	Q	.	.	.	.
13.25	0.0325	0.06	Q	.	.	.	.
13.52	0.0341	0.07	Q	.	.	.	.
13.80	0.0357	0.07	Q	.	.	.	.
14.07	0.0374	0.08	Q	.	.	.	.
14.35	0.0393	0.09	Q	.	.	.	.
14.62	0.0413	0.10	Q	.	.	.	.
14.90	0.0436	0.10	Q	.	.	.	.
15.18	0.0461	0.12	Q	.	.	.	.
15.45	0.0490	0.13	Q	.	.	.	.
15.73	0.0524	0.16	Q	.	.	.	.
16.00	0.0584	0.37	.Q	.	.	.	.
16.27	0.0846	1.93	.	Q	.	.	.
16.55	0.1081	0.14	Q	.	.	.	.
16.83	0.1110	0.11	Q	.	.	.	.
17.10	0.1133	0.09	Q	.	.	.	.
17.38	0.1151	0.08	Q	.	.	.	.
17.65	0.1168	0.07	Q	.	.	.	.
17.92	0.1182	0.06	Q	.	.	.	.
18.20	0.1195	0.05	Q	.	.	.	.
18.48	0.1206	0.04	Q	.	.	.	.
18.75	0.1215	0.04	Q	.	.	.	.
19.02	0.1224	0.04	Q	.	.	.	.
19.30	0.1232	0.03	Q	.	.	.	.
19.58	0.1240	0.03	Q	.	.	.	.
19.85	0.1247	0.03	Q	.	.	.	.

20.12	0.1254	0.03	Q	.	.	.	.
20.40	0.1261	0.03	Q	.	.	.	.
20.67	0.1268	0.03	Q	.	.	.	.
20.95	0.1274	0.03	Q	.	.	.	.
21.23	0.1280	0.03	Q	.	.	.	.
21.50	0.1285	0.02	Q	.	.	.	.
21.77	0.1291	0.02	Q	.	.	.	.
22.05	0.1296	0.02	Q	.	.	.	.
22.33	0.1302	0.02	Q	.	.	.	.
22.60	0.1307	0.02	Q	.	.	.	.
22.88	0.1312	0.02	Q	.	.	.	.
23.15	0.1317	0.02	Q	.	.	.	.
23.42	0.1321	0.02	Q	.	.	.	.
23.70	0.1326	0.02	Q	.	.	.	.
23.98	0.1330	0.02	Q	.	.	.	.
24.25	0.1335	0.02	Q	.	.	.	.
24.52	0.1337	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1452.0
10%	33.0
20%	16.5
30%	16.5
40%	16.5
50%	16.5
60%	16.5
70%	16.5
80%	16.5
90%	16.5

10-YEAR, 24-HOUR: EXISTING CONDITIONS

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 2.30
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.200
LOW LOSS FRACTION = 0.520
TIME OF CONCENTRATION(MIN.) = 16.50
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 10
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.34
30-MINUTE POINT RAINFALL VALUE(INCHES) = 0.72
1-HOUR POINT RAINFALL VALUE(INCHES) = 0.95
3-HOUR POINT RAINFALL VALUE(INCHES) = 1.59
6-HOUR POINT RAINFALL VALUE(INCHES) = 2.20
24-HOUR POINT RAINFALL VALUE(INCHES) = 3.68

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.35
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.35

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.05	0.0000	0.00	Q	.	.	.	.
0.32	0.0006	0.06	Q	.	.	.	.
0.60	0.0019	0.06	Q	.	.	.	.
0.88	0.0033	0.06	Q	.	.	.	.
1.15	0.0046	0.06	Q	.	.	.	.
1.42	0.0059	0.06	Q	.	.	.	.
1.70	0.0073	0.06	Q	.	.	.	.
1.98	0.0087	0.06	Q	.	.	.	.
2.25	0.0100	0.06	Q	.	.	.	.
2.53	0.0115	0.06	Q	.	.	.	.
2.80	0.0129	0.06	Q	.	.	.	.
3.08	0.0143	0.06	Q	.	.	.	.
3.35	0.0158	0.06	Q	.	.	.	.
3.62	0.0173	0.07	Q	.	.	.	.
3.90	0.0188	0.07	Q	.	.	.	.
4.18	0.0203	0.07	Q	.	.	.	.
4.45	0.0218	0.07	Q	.	.	.	.
4.72	0.0234	0.07	Q	.	.	.	.
5.00	0.0250	0.07	Q	.	.	.	.
5.28	0.0266	0.07	Q	.	.	.	.
5.55	0.0283	0.07	Q	.	.	.	.
5.82	0.0299	0.07	Q	.	.	.	.
6.10	0.0316	0.08	Q	.	.	.	.

10-YEAR, 24-HOUR: EXISTING CONDITIONS

6.38	0.0334	0.08	Q	.	.	.	.
6.65	0.0351	0.08	Q	.	.	.	.
6.93	0.0369	0.08	Q	.	.	.	.
7.20	0.0387	0.08	Q	.	.	.	.
7.47	0.0406	0.08	Q	.	.	.	.
7.75	0.0425	0.08	Q	.	.	.	.
8.02	0.0444	0.09	Q	.	.	.	.
8.30	0.0464	0.09	Q	.	.	.	.
8.57	0.0484	0.09	Q	.	.	.	.
8.85	0.0505	0.09	Q	.	.	.	.
9.12	0.0526	0.09	Q	.	.	.	.
9.40	0.0548	0.10	Q	.	.	.	.
9.68	0.0570	0.10	Q	.	.	.	.
9.95	0.0593	0.10	Q	.	.	.	.
10.23	0.0616	0.11	Q	.	.	.	.
10.50	0.0640	0.11	Q	.	.	.	.
10.77	0.0665	0.11	Q	.	.	.	.
11.05	0.0691	0.11	Q	.	.	.	.
11.32	0.0718	0.12	Q	.	.	.	.
11.60	0.0745	0.12	Q	.	.	.	.
11.88	0.0774	0.13	Q	.	.	.	.
12.15	0.0804	0.13	Q	.	.	.	.
12.43	0.0839	0.18	Q	.	.	.	.
12.70	0.0879	0.18	Q	.	.	.	.
12.98	0.0922	0.19	Q	.	.	.	.
13.25	0.0966	0.20	Q	.	.	.	.
13.52	0.1013	0.21	Q	.	.	.	.
13.80	0.1062	0.22	Q	.	.	.	.
14.07	0.1114	0.24	Q	.	.	.	.
14.35	0.1170	0.25	.Q	.	.	.	.
14.62	0.1231	0.28	.Q	.	.	.	.
14.90	0.1297	0.30	.Q	.	.	.	.
15.18	0.1372	0.36	.Q	.	.	.	.
15.45	0.1459	0.41	.Q	.	.	.	.
15.73	0.1571	0.58	. Q	.	.	.	.
16.00	0.1750	1.00	. Q	.	.	.	.
16.27	0.2295	3.81	.	.	Q	.	.
16.55	0.2778	0.44	.Q	.	.	.	.
16.83	0.2865	0.33	.Q	.	.	.	.
17.10	0.2933	0.27	.Q	.	.	.	.
17.38	0.2989	0.23	Q	.	.	.	.
17.65	0.3038	0.20	Q	.	.	.	.
17.92	0.3083	0.19	Q	.	.	.	.
18.20	0.3123	0.17	Q	.	.	.	.
18.48	0.3156	0.13	Q	.	.	.	.
18.75	0.3183	0.12	Q	.	.	.	.
19.02	0.3209	0.11	Q	.	.	.	.
19.30	0.3233	0.10	Q	.	.	.	.
19.58	0.3256	0.10	Q	.	.	.	.
19.85	0.3278	0.09	Q	.	.	.	.

10-YEAR, 24-HOUR: EXISTING CONDITIONS

20.12	0.3298	0.09	Q	.	.	.	.
20.40	0.3318	0.09	Q	.	.	.	.
20.67	0.3337	0.08	Q	.	.	.	.
20.95	0.3355	0.08	Q	.	.	.	.
21.23	0.3373	0.08	Q	.	.	.	.
21.50	0.3390	0.07	Q	.	.	.	.
21.77	0.3406	0.07	Q	.	.	.	.
22.05	0.3422	0.07	Q	.	.	.	.
22.33	0.3438	0.07	Q	.	.	.	.
22.60	0.3453	0.07	Q	.	.	.	.
22.88	0.3468	0.06	Q	.	.	.	.
23.15	0.3482	0.06	Q	.	.	.	.
23.42	0.3496	0.06	Q	.	.	.	.
23.70	0.3509	0.06	Q	.	.	.	.
23.98	0.3523	0.06	Q	.	.	.	.
24.25	0.3536	0.06	Q	.	.	.	.
24.52	0.3542	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1452.0
10%	82.5
20%	33.0
30%	16.5
40%	16.5
50%	16.5
60%	16.5
70%	16.5
80%	16.5
90%	16.5

25-YEAR, 24-HOUR: EXISTING CONDITIONS

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 2.30
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.200
LOW LOSS FRACTION = 0.450
TIME OF CONCENTRATION(MIN.) = 16.50
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 25
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.40
30-MINUTE POINT RAINFALL VALUE(INCHES) = 0.87
1-HOUR POINT RAINFALL VALUE(INCHES) = 1.15
3-HOUR POINT RAINFALL VALUE(INCHES) = 1.94
6-HOUR POINT RAINFALL VALUE(INCHES) = 2.71
24-HOUR POINT RAINFALL VALUE(INCHES) = 4.49

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.48
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.38

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.05	0.0000	0.00	Q	.	.	.	.
0.32	0.0009	0.08	Q	.	.	.	.
0.60	0.0027	0.08	Q	.	.	.	.
0.88	0.0045	0.08	Q	.	.	.	.
1.15	0.0063	0.08	Q	.	.	.	.
1.42	0.0081	0.08	Q	.	.	.	.
1.70	0.0100	0.08	Q	.	.	.	.
1.98	0.0119	0.08	Q	.	.	.	.
2.25	0.0138	0.08	Q	.	.	.	.
2.53	0.0157	0.09	Q	.	.	.	.
2.80	0.0177	0.09	Q	.	.	.	.
3.08	0.0197	0.09	Q	.	.	.	.
3.35	0.0217	0.09	Q	.	.	.	.
3.62	0.0237	0.09	Q	.	.	.	.
3.90	0.0258	0.09	Q	.	.	.	.
4.18	0.0279	0.09	Q	.	.	.	.
4.45	0.0300	0.09	Q	.	.	.	.
4.72	0.0322	0.10	Q	.	.	.	.
5.00	0.0343	0.10	Q	.	.	.	.
5.28	0.0366	0.10	Q	.	.	.	.
5.55	0.0388	0.10	Q	.	.	.	.
5.82	0.0411	0.10	Q	.	.	.	.
6.10	0.0435	0.10	Q	.	.	.	.

6.38	0.0459	0.11	Q	.	.	.	.
6.65	0.0483	0.11	Q	.	.	.	.
6.93	0.0507	0.11	Q	.	.	.	.
7.20	0.0533	0.11	Q	.	.	.	.
7.47	0.0558	0.11	Q	.	.	.	.
7.75	0.0584	0.12	Q	.	.	.	.
8.02	0.0611	0.12	Q	.	.	.	.
8.30	0.0638	0.12	Q	.	.	.	.
8.57	0.0666	0.12	Q	.	.	.	.
8.85	0.0695	0.13	Q	.	.	.	.
9.12	0.0724	0.13	Q	.	.	.	.
9.40	0.0754	0.13	Q	.	.	.	.
9.68	0.0784	0.14	Q	.	.	.	.
9.95	0.0816	0.14	Q	.	.	.	.
10.23	0.0848	0.15	Q	.	.	.	.
10.50	0.0882	0.15	Q	.	.	.	.
10.77	0.0916	0.15	Q	.	.	.	.
11.05	0.0952	0.16	Q	.	.	.	.
11.32	0.0988	0.17	Q	.	.	.	.
11.60	0.1027	0.17	Q	.	.	.	.
11.88	0.1066	0.18	Q	.	.	.	.
12.15	0.1107	0.18	Q	.	.	.	.
12.43	0.1157	0.26	.Q	.	.	.	.
12.70	0.1216	0.26	.Q	.	.	.	.
12.98	0.1278	0.28	.Q	.	.	.	.
13.25	0.1342	0.29	.Q	.	.	.	.
13.52	0.1409	0.31	.Q	.	.	.	.
13.80	0.1480	0.32	.Q	.	.	.	.
14.07	0.1556	0.35	.Q	.	.	.	.
14.35	0.1636	0.36	.Q	.	.	.	.
14.62	0.1722	0.40	.Q	.	.	.	.
14.90	0.1816	0.43	.Q	.	.	.	.
15.18	0.1921	0.50	. Q	.	.	.	.
15.45	0.2046	0.60	. Q	.	.	.	.
15.73	0.2205	0.79	. Q	.	.	.	.
16.00	0.2447	1.34	. Q	.	.	.	.
16.27	0.3126	4.64	.	.	Q	.	.
16.55	0.3725	0.63	. Q	.	.	.	.
16.83	0.3849	0.46	.Q	.	.	.	.
17.10	0.3944	0.38	.Q	.	.	.	.
17.38	0.4025	0.33	.Q	.	.	.	.
17.65	0.4096	0.30	.Q	.	.	.	.
17.92	0.4160	0.27	.Q	.	.	.	.
18.20	0.4218	0.24	Q	.	.	.	.
18.48	0.4265	0.17	Q	.	.	.	.
18.75	0.4303	0.16	Q	.	.	.	.
19.02	0.4339	0.15	Q	.	.	.	.
19.30	0.4372	0.14	Q	.	.	.	.
19.58	0.4404	0.14	Q	.	.	.	.
19.85	0.4434	0.13	Q	.	.	.	.

20.12	0.4462	0.12	Q	.	.	.	.
20.40	0.4490	0.12	Q	.	.	.	.
20.67	0.4516	0.11	Q	.	.	.	.
20.95	0.4541	0.11	Q	.	.	.	.
21.23	0.4565	0.10	Q	.	.	.	.
21.50	0.4589	0.10	Q	.	.	.	.
21.77	0.4611	0.10	Q	.	.	.	.
22.05	0.4633	0.09	Q	.	.	.	.
22.33	0.4654	0.09	Q	.	.	.	.
22.60	0.4675	0.09	Q	.	.	.	.
22.88	0.4695	0.09	Q	.	.	.	.
23.15	0.4715	0.09	Q	.	.	.	.
23.42	0.4734	0.08	Q	.	.	.	.
23.70	0.4752	0.08	Q	.	.	.	.
23.98	0.4771	0.08	Q	.	.	.	.
24.25	0.4788	0.08	Q	.	.	.	.
24.52	0.4797	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1452.0
10%	99.0
20%	33.0
30%	16.5
40%	16.5
50%	16.5
60%	16.5
70%	16.5
80%	16.5
90%	16.5

100-YEAR, 24-HOUR: EXISTING CONDITIONS

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 2.30
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.200
LOW LOSS FRACTION = 0.390
TIME OF CONCENTRATION(MIN.) = 16.50
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 100
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.52
30-MINUTE POINT RAINFALL VALUE(INCHES) = 1.09
1-HOUR POINT RAINFALL VALUE(INCHES) = 1.45
3-HOUR POINT RAINFALL VALUE(INCHES) = 2.43
6-HOUR POINT RAINFALL VALUE(INCHES) = 3.36
24-HOUR POINT RAINFALL VALUE(INCHES) = 5.63

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.66
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.42

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.05	0.0000	0.00	Q	.	.	.	.
0.32	0.0013	0.11	Q	.	.	.	.
0.60	0.0038	0.11	Q	.	.	.	.
0.88	0.0063	0.11	Q	.	.	.	.
1.15	0.0089	0.11	Q	.	.	.	.
1.42	0.0116	0.12	Q	.	.	.	.
1.70	0.0142	0.12	Q	.	.	.	.
1.98	0.0169	0.12	Q	.	.	.	.
2.25	0.0196	0.12	Q	.	.	.	.
2.53	0.0223	0.12	Q	.	.	.	.
2.80	0.0251	0.12	Q	.	.	.	.
3.08	0.0279	0.12	Q	.	.	.	.
3.35	0.0308	0.13	Q	.	.	.	.
3.62	0.0337	0.13	Q	.	.	.	.
3.90	0.0366	0.13	Q	.	.	.	.
4.18	0.0396	0.13	Q	.	.	.	.
4.45	0.0426	0.13	Q	.	.	.	.
4.72	0.0457	0.14	Q	.	.	.	.
5.00	0.0488	0.14	Q	.	.	.	.
5.28	0.0519	0.14	Q	.	.	.	.
5.55	0.0551	0.14	Q	.	.	.	.
5.82	0.0584	0.14	Q	.	.	.	.
6.10	0.0617	0.15	Q	.	.	.	.

6.38	0.0651	0.15	Q	.	.	.	.
6.65	0.0685	0.15	Q	.	.	.	.
6.93	0.0720	0.16	Q	.	.	.	.
7.20	0.0755	0.16	Q	.	.	.	.
7.47	0.0792	0.16	Q	.	.	.	.
7.75	0.0829	0.16	Q	.	.	.	.
8.02	0.0866	0.17	Q	.	.	.	.
8.30	0.0905	0.17	Q	.	.	.	.
8.57	0.0944	0.18	Q	.	.	.	.
8.85	0.0985	0.18	Q	.	.	.	.
9.12	0.1026	0.18	Q	.	.	.	.
9.40	0.1068	0.19	Q	.	.	.	.
9.68	0.1111	0.19	Q	.	.	.	.
9.95	0.1156	0.20	Q	.	.	.	.
10.23	0.1202	0.21	Q	.	.	.	.
10.50	0.1249	0.21	Q	.	.	.	.
10.77	0.1297	0.22	Q	.	.	.	.
11.05	0.1347	0.22	Q	.	.	.	.
11.32	0.1399	0.23	Q	.	.	.	.
11.60	0.1453	0.24	Q	.	.	.	.
11.88	0.1508	0.25	.Q	.	.	.	.
12.15	0.1566	0.26	.Q	.	.	.	.
12.43	0.1634	0.34	.Q	.	.	.	.
12.70	0.1713	0.35	.Q	.	.	.	.
12.98	0.1795	0.37	.Q	.	.	.	.
13.25	0.1881	0.38	.Q	.	.	.	.
13.52	0.1971	0.41	.Q	.	.	.	.
13.80	0.2067	0.43	.Q	.	.	.	.
14.07	0.2168	0.47	.Q	.	.	.	.
14.35	0.2277	0.49	.Q	.	.	.	.
14.62	0.2395	0.55	. Q	.	.	.	.
14.90	0.2524	0.59	. Q	.	.	.	.
15.18	0.2672	0.72	. Q	.	.	.	.
15.45	0.2850	0.85	. Q	.	.	.	.
15.73	0.3076	1.14	. Q	.	.	.	.
16.00	0.3399	1.71	. Q	.	.	.	.
16.27	0.4275	6.00	.	.	.	Q	.	.
16.55	0.5060	0.92	. Q	.	.	.	.
16.83	0.5237	0.63	. Q	.	.	.	.
17.10	0.5367	0.52	. Q	.	.	.	.
17.38	0.5477	0.44	.Q	.	.	.	.
17.65	0.5572	0.40	.Q	.	.	.	.
17.92	0.5658	0.36	.Q	.	.	.	.
18.20	0.5736	0.32	.Q	.	.	.	.
18.48	0.5800	0.24	Q	.	.	.	.
18.75	0.5854	0.23	Q	.	.	.	.
19.02	0.5904	0.21	Q	.	.	.	.
19.30	0.5951	0.20	Q	.	.	.	.
19.58	0.5996	0.19	Q	.	.	.	.
19.85	0.6038	0.18	Q	.	.	.	.

20.12	0.6078	0.17	Q	.	.	.	.
20.40	0.6117	0.17	Q	.	.	.	.
20.67	0.6154	0.16	Q	.	.	.	.
20.95	0.6189	0.15	Q	.	.	.	.
21.23	0.6224	0.15	Q	.	.	.	.
21.50	0.6257	0.14	Q	.	.	.	.
21.77	0.6289	0.14	Q	.	.	.	.
22.05	0.6320	0.13	Q	.	.	.	.
22.33	0.6350	0.13	Q	.	.	.	.
22.60	0.6379	0.13	Q	.	.	.	.
22.88	0.6408	0.12	Q	.	.	.	.
23.15	0.6436	0.12	Q	.	.	.	.
23.42	0.6463	0.12	Q	.	.	.	.
23.70	0.6489	0.12	Q	.	.	.	.
23.98	0.6515	0.11	Q	.	.	.	.
24.25	0.6541	0.11	Q	.	.	.	.
24.52	0.6553	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1452.0
10%	115.5
20%	33.0
30%	16.5
40%	16.5
50%	16.5
60%	16.5
70%	16.5
80%	16.5
90%	16.5

2-YEAR, 24-HOUR: PROPOSED CONDITIONS

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 2.30
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.080
LOW LOSS FRACTION = 0.210
TIME OF CONCENTRATION(MIN.) = 11.00
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 2
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.19
30-MINUTE POINT RAINFALL VALUE(INCHES) = 0.40
1-HOUR POINT RAINFALL VALUE(INCHES) = 0.53
3-HOUR POINT RAINFALL VALUE(INCHES) = 0.89
6-HOUR POINT RAINFALL VALUE(INCHES) = 1.22
24-HOUR POINT RAINFALL VALUE(INCHES) = 2.05

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.28
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.11

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.05	0.0000	0.00	Q	.	.	.	.
0.23	0.0004	0.05	Q	.	.	.	.
0.42	0.0012	0.05	Q	.	.	.	.
0.60	0.0020	0.05	Q	.	.	.	.
0.78	0.0028	0.05	Q	.	.	.	.
0.97	0.0036	0.05	Q	.	.	.	.
1.15	0.0044	0.05	Q	.	.	.	.
1.33	0.0053	0.05	Q	.	.	.	.
1.52	0.0061	0.06	Q	.	.	.	.
1.70	0.0069	0.06	Q	.	.	.	.
1.88	0.0078	0.06	Q	.	.	.	.
2.07	0.0087	0.06	Q	.	.	.	.
2.25	0.0095	0.06	Q	.	.	.	.
2.43	0.0104	0.06	Q	.	.	.	.
2.62	0.0113	0.06	Q	.	.	.	.
2.80	0.0121	0.06	Q	.	.	.	.
2.98	0.0130	0.06	Q	.	.	.	.
3.17	0.0139	0.06	Q	.	.	.	.
3.35	0.0148	0.06	Q	.	.	.	.
3.53	0.0158	0.06	Q	.	.	.	.
3.72	0.0167	0.06	Q	.	.	.	.
3.90	0.0176	0.06	Q	.	.	.	.
4.08	0.0185	0.06	Q	.	.	.	.

2-YEAR, 24-HOUR: PROPOSED CONDITIONS

4.27	0.0195	0.06	Q	.	.	.	.
4.45	0.0205	0.06	Q	.	.	.	.
4.63	0.0214	0.06	Q	.	.	.	.
4.82	0.0224	0.06	Q	.	.	.	.
5.00	0.0234	0.07	Q	.	.	.	.
5.18	0.0244	0.07	Q	.	.	.	.
5.37	0.0254	0.07	Q	.	.	.	.
5.55	0.0264	0.07	Q	.	.	.	.
5.73	0.0274	0.07	Q	.	.	.	.
5.92	0.0285	0.07	Q	.	.	.	.
6.10	0.0295	0.07	Q	.	.	.	.
6.28	0.0306	0.07	Q	.	.	.	.
6.47	0.0317	0.07	Q	.	.	.	.
6.65	0.0328	0.07	Q	.	.	.	.
6.83	0.0339	0.07	Q	.	.	.	.
7.02	0.0350	0.07	Q	.	.	.	.
7.20	0.0361	0.08	Q	.	.	.	.
7.38	0.0373	0.08	Q	.	.	.	.
7.57	0.0384	0.08	Q	.	.	.	.
7.75	0.0396	0.08	Q	.	.	.	.
7.93	0.0408	0.08	Q	.	.	.	.
8.12	0.0420	0.08	Q	.	.	.	.
8.30	0.0433	0.08	Q	.	.	.	.
8.48	0.0445	0.08	Q	.	.	.	.
8.67	0.0458	0.08	Q	.	.	.	.
8.85	0.0470	0.09	Q	.	.	.	.
9.03	0.0484	0.09	Q	.	.	.	.
9.22	0.0497	0.09	Q	.	.	.	.
9.40	0.0510	0.09	Q	.	.	.	.
9.58	0.0524	0.09	Q	.	.	.	.
9.77	0.0538	0.09	Q	.	.	.	.
9.95	0.0552	0.09	Q	.	.	.	.
10.13	0.0567	0.10	Q	.	.	.	.
10.32	0.0581	0.10	Q	.	.	.	.
10.50	0.0596	0.10	Q	.	.	.	.
10.68	0.0612	0.10	Q	.	.	.	.
10.87	0.0627	0.10	Q	.	.	.	.
11.05	0.0643	0.11	Q	.	.	.	.
11.23	0.0660	0.11	Q	.	.	.	.
11.42	0.0677	0.11	Q	.	.	.	.
11.60	0.0694	0.11	Q	.	.	.	.
11.78	0.0711	0.12	Q	.	.	.	.
11.97	0.0729	0.12	Q	.	.	.	.
12.15	0.0750	0.14	Q	.	.	.	.
12.33	0.0772	0.15	Q	.	.	.	.
12.52	0.0796	0.16	Q	.	.	.	.
12.70	0.0821	0.16	Q	.	.	.	.
12.88	0.0846	0.17	Q	.	.	.	.
13.07	0.0872	0.17	Q	.	.	.	.
13.25	0.0899	0.18	Q	.	.	.	.

13.43	0.0926	0.19	Q	.	.	.	.
13.62	0.0955	0.20	Q	.	.	.	.
13.80	0.0985	0.20	Q	.	.	.	.
13.98	0.1017	0.21	Q	.	.	.	.
14.17	0.1050	0.22	Q	.	.	.	.
14.35	0.1085	0.24	Q	.	.	.	.
14.53	0.1123	0.25	.Q	.	.	.	.
14.72	0.1163	0.28	.Q	.	.	.	.
14.90	0.1206	0.29	.Q	.	.	.	.
15.08	0.1252	0.32	.Q	.	.	.	.
15.27	0.1303	0.35	.Q	.	.	.	.
15.45	0.1358	0.38	.Q	.	.	.	.
15.63	0.1417	0.40	.Q	.	.	.	.
15.82	0.1490	0.57	. Q	.	.	.	.
16.00	0.1596	0.83	. Q	.	.	.	.
16.18	0.1872	2.81	.	.Q	.	.	.
16.37	0.2119	0.46	.Q	.	.	.	.
16.55	0.2183	0.37	.Q	.	.	.	.
16.73	0.2234	0.31	.Q	.	.	.	.
16.92	0.2277	0.26	.Q	.	.	.	.
17.10	0.2315	0.24	Q	.	.	.	.
17.28	0.2348	0.21	Q	.	.	.	.
17.47	0.2378	0.19	Q	.	.	.	.
17.65	0.2406	0.18	Q	.	.	.	.
17.83	0.2432	0.17	Q	.	.	.	.
18.02	0.2457	0.16	Q	.	.	.	.
18.20	0.2478	0.12	Q	.	.	.	.
18.38	0.2496	0.12	Q	.	.	.	.
18.57	0.2513	0.11	Q	.	.	.	.
18.75	0.2530	0.11	Q	.	.	.	.
18.93	0.2545	0.10	Q	.	.	.	.
19.12	0.2560	0.10	Q	.	.	.	.
19.30	0.2575	0.09	Q	.	.	.	.
19.48	0.2589	0.09	Q	.	.	.	.
19.67	0.2602	0.09	Q	.	.	.	.
19.85	0.2615	0.08	Q	.	.	.	.
20.03	0.2628	0.08	Q	.	.	.	.
20.22	0.2640	0.08	Q	.	.	.	.
20.40	0.2652	0.08	Q	.	.	.	.
20.58	0.2664	0.08	Q	.	.	.	.
20.77	0.2675	0.07	Q	.	.	.	.
20.95	0.2686	0.07	Q	.	.	.	.
21.13	0.2697	0.07	Q	.	.	.	.
21.32	0.2708	0.07	Q	.	.	.	.
21.50	0.2718	0.07	Q	.	.	.	.
21.68	0.2728	0.07	Q	.	.	.	.
21.87	0.2738	0.06	Q	.	.	.	.
22.05	0.2748	0.06	Q	.	.	.	.
22.23	0.2757	0.06	Q	.	.	.	.
22.42	0.2766	0.06	Q	.	.	.	.

22.60	0.2775	0.06	Q	.	.	.	.
22.78	0.2784	0.06	Q	.	.	.	.
22.97	0.2793	0.06	Q	.	.	.	.
23.15	0.2802	0.06	Q	.	.	.	.
23.33	0.2811	0.06	Q	.	.	.	.
23.52	0.2819	0.06	Q	.	.	.	.
23.70	0.2827	0.05	Q	.	.	.	.
23.88	0.2835	0.05	Q	.	.	.	.
24.07	0.2843	0.05	Q	.	.	.	.
24.25	0.2847	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1441.0
10%	121.0
20%	33.0
30%	11.0
40%	11.0
50%	11.0
60%	11.0
70%	11.0
80%	11.0
90%	11.0

10-YEAR, 24-HOUR: PROPOSED CONDITIONS

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 2.30
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.080
LOW LOSS FRACTION = 0.120
TIME OF CONCENTRATION(MIN.) = 11.00
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 10
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.34
30-MINUTE POINT RAINFALL VALUE(INCHES) = 0.72
1-HOUR POINT RAINFALL VALUE(INCHES) = 0.95
3-HOUR POINT RAINFALL VALUE(INCHES) = 1.59
6-HOUR POINT RAINFALL VALUE(INCHES) = 2.20
24-HOUR POINT RAINFALL VALUE(INCHES) = 3.68

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.56
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.14

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.05	0.0000	0.00	Q	.	.	.	.
0.23	0.0008	0.10	Q	.	.	.	.
0.42	0.0024	0.10	Q	.	.	.	.
0.60	0.0040	0.11	Q	.	.	.	.
0.78	0.0056	0.11	Q	.	.	.	.
0.97	0.0072	0.11	Q	.	.	.	.
1.15	0.0088	0.11	Q	.	.	.	.
1.33	0.0105	0.11	Q	.	.	.	.
1.52	0.0121	0.11	Q	.	.	.	.
1.70	0.0138	0.11	Q	.	.	.	.
1.88	0.0155	0.11	Q	.	.	.	.
2.07	0.0172	0.11	Q	.	.	.	.
2.25	0.0189	0.11	Q	.	.	.	.
2.43	0.0206	0.11	Q	.	.	.	.
2.62	0.0223	0.12	Q	.	.	.	.
2.80	0.0241	0.12	Q	.	.	.	.
2.98	0.0258	0.12	Q	.	.	.	.
3.17	0.0276	0.12	Q	.	.	.	.
3.35	0.0294	0.12	Q	.	.	.	.
3.53	0.0312	0.12	Q	.	.	.	.
3.72	0.0331	0.12	Q	.	.	.	.
3.90	0.0349	0.12	Q	.	.	.	.
4.08	0.0368	0.12	Q	.	.	.	.

10-YEAR, 24-HOUR: PROPOSED CONDITIONS

4.27	0.0387	0.12	Q	.	.	.	.
4.45	0.0406	0.13	Q	.	.	.	.
4.63	0.0425	0.13	Q	.	.	.	.
4.82	0.0444	0.13	Q	.	.	.	.
5.00	0.0464	0.13	Q	.	.	.	.
5.18	0.0484	0.13	Q	.	.	.	.
5.37	0.0504	0.13	Q	.	.	.	.
5.55	0.0524	0.13	Q	.	.	.	.
5.73	0.0544	0.14	Q	.	.	.	.
5.92	0.0565	0.14	Q	.	.	.	.
6.10	0.0586	0.14	Q	.	.	.	.
6.28	0.0607	0.14	Q	.	.	.	.
6.47	0.0629	0.14	Q	.	.	.	.
6.65	0.0650	0.14	Q	.	.	.	.
6.83	0.0672	0.15	Q	.	.	.	.
7.02	0.0694	0.15	Q	.	.	.	.
7.20	0.0717	0.15	Q	.	.	.	.
7.38	0.0740	0.15	Q	.	.	.	.
7.57	0.0763	0.15	Q	.	.	.	.
7.75	0.0786	0.16	Q	.	.	.	.
7.93	0.0810	0.16	Q	.	.	.	.
8.12	0.0834	0.16	Q	.	.	.	.
8.30	0.0858	0.16	Q	.	.	.	.
8.48	0.0883	0.17	Q	.	.	.	.
8.67	0.0908	0.17	Q	.	.	.	.
8.85	0.0934	0.17	Q	.	.	.	.
9.03	0.0960	0.17	Q	.	.	.	.
9.22	0.0986	0.18	Q	.	.	.	.
9.40	0.1013	0.18	Q	.	.	.	.
9.58	0.1040	0.18	Q	.	.	.	.
9.77	0.1068	0.18	Q	.	.	.	.
9.95	0.1096	0.19	Q	.	.	.	.
10.13	0.1125	0.19	Q	.	.	.	.
10.32	0.1154	0.20	Q	.	.	.	.
10.50	0.1184	0.20	Q	.	.	.	.
10.68	0.1215	0.20	Q	.	.	.	.
10.87	0.1246	0.21	Q	.	.	.	.
11.05	0.1278	0.21	Q	.	.	.	.
11.23	0.1310	0.22	Q	.	.	.	.
11.42	0.1344	0.22	Q	.	.	.	.
11.60	0.1378	0.23	Q	.	.	.	.
11.78	0.1413	0.24	Q	.	.	.	.
11.97	0.1449	0.24	Q	.	.	.	.
12.15	0.1489	0.30	.Q	.	.	.	.
12.33	0.1536	0.32	.Q	.	.	.	.
12.52	0.1585	0.33	.Q	.	.	.	.
12.70	0.1636	0.34	.Q	.	.	.	.
12.88	0.1688	0.35	.Q	.	.	.	.
13.07	0.1742	0.36	.Q	.	.	.	.
13.25	0.1797	0.37	.Q	.	.	.	.

10-YEAR, 24-HOUR: PROPOSED CONDITIONS

13.43	0.1854	0.38	.Q	.	.	.	.
13.62	0.1913	0.40	.Q	.	.	.	.
13.80	0.1975	0.41	.Q	.	.	.	.
13.98	0.2039	0.44	.Q	.	.	.	.
14.17	0.2107	0.45	.Q	.	.	.	.
14.35	0.2177	0.48	.Q	.	.	.	.
14.53	0.2252	0.50	. Q	.	.	.	.
14.72	0.2331	0.55	. Q	.	.	.	.
14.90	0.2416	0.57	. Q	.	.	.	.
15.08	0.2508	0.64	. Q	.	.	.	.
15.27	0.2608	0.69	. Q	.	.	.	.
15.45	0.2717	0.75	. Q	.	.	.	.
15.63	0.2834	0.78	. Q	.	.	.	.
15.82	0.2980	1.15	. Q	.	.	.	.
16.00	0.3190	1.63	. Q	.	.	.	.
16.18	0.3706	5.18	.	.	Q	.	.
16.37	0.4167	0.91	. Q	.	.	.	.
16.55	0.4292	0.74	. Q	.	.	.	.
16.73	0.4393	0.60	. Q	.	.	.	.
16.92	0.4479	0.52	. Q	.	.	.	.
17.10	0.4554	0.47	.Q	.	.	.	.
17.28	0.4621	0.42	.Q	.	.	.	.
17.47	0.4683	0.39	.Q	.	.	.	.
17.65	0.4740	0.36	.Q	.	.	.	.
17.83	0.4794	0.34	.Q	.	.	.	.
18.02	0.4844	0.32	.Q	.	.	.	.
18.20	0.4887	0.24	Q	.	.	.	.
18.38	0.4923	0.23	Q	.	.	.	.
18.57	0.4958	0.22	Q	.	.	.	.
18.75	0.4990	0.21	Q	.	.	.	.
18.93	0.5021	0.20	Q	.	.	.	.
19.12	0.5051	0.19	Q	.	.	.	.
19.30	0.5080	0.19	Q	.	.	.	.
19.48	0.5108	0.18	Q	.	.	.	.
19.67	0.5135	0.17	Q	.	.	.	.
19.85	0.5161	0.17	Q	.	.	.	.
20.03	0.5186	0.16	Q	.	.	.	.
20.22	0.5210	0.16	Q	.	.	.	.
20.40	0.5234	0.15	Q	.	.	.	.
20.58	0.5257	0.15	Q	.	.	.	.
20.77	0.5279	0.15	Q	.	.	.	.
20.95	0.5301	0.14	Q	.	.	.	.
21.13	0.5323	0.14	Q	.	.	.	.
21.32	0.5344	0.14	Q	.	.	.	.
21.50	0.5364	0.13	Q	.	.	.	.
21.68	0.5384	0.13	Q	.	.	.	.
21.87	0.5404	0.13	Q	.	.	.	.
22.05	0.5423	0.13	Q	.	.	.	.
22.23	0.5442	0.12	Q	.	.	.	.
22.42	0.5460	0.12	Q	.	.	.	.

22.60	0.5478	0.12	Q	.	.	.	.
22.78	0.5496	0.12	Q	.	.	.	.
22.97	0.5514	0.11	Q	.	.	.	.
23.15	0.5531	0.11	Q	.	.	.	.
23.33	0.5548	0.11	Q	.	.	.	.
23.52	0.5565	0.11	Q	.	.	.	.
23.70	0.5581	0.11	Q	.	.	.	.
23.88	0.5597	0.11	Q	.	.	.	.
24.07	0.5613	0.10	Q	.	.	.	.
24.25	0.5621	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1441.0
10%	143.0
20%	33.0
30%	22.0
40%	11.0
50%	11.0
60%	11.0
70%	11.0
80%	11.0
90%	11.0

25-YEAR, 24-HOUR: PROPOSED CONDITIONS

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 2.30
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.080
LOW LOSS FRACTION = 0.100
TIME OF CONCENTRATION(MIN.) = 11.00
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 25
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.40
30-MINUTE POINT RAINFALL VALUE(INCHES) = 0.87
1-HOUR POINT RAINFALL VALUE(INCHES) = 1.15
3-HOUR POINT RAINFALL VALUE(INCHES) = 1.94
6-HOUR POINT RAINFALL VALUE(INCHES) = 2.71
24-HOUR POINT RAINFALL VALUE(INCHES) = 4.49

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.70
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.16

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.05	0.0000	0.00	Q	.	.	.	.
0.23	0.0010	0.13	Q	.	.	.	.
0.42	0.0029	0.13	Q	.	.	.	.
0.60	0.0049	0.13	Q	.	.	.	.
0.78	0.0068	0.13	Q	.	.	.	.
0.97	0.0088	0.13	Q	.	.	.	.
1.15	0.0108	0.13	Q	.	.	.	.
1.33	0.0128	0.13	Q	.	.	.	.
1.52	0.0148	0.13	Q	.	.	.	.
1.70	0.0169	0.14	Q	.	.	.	.
1.88	0.0189	0.14	Q	.	.	.	.
2.07	0.0210	0.14	Q	.	.	.	.
2.25	0.0231	0.14	Q	.	.	.	.
2.43	0.0252	0.14	Q	.	.	.	.
2.62	0.0274	0.14	Q	.	.	.	.
2.80	0.0295	0.14	Q	.	.	.	.
2.98	0.0317	0.14	Q	.	.	.	.
3.17	0.0339	0.14	Q	.	.	.	.
3.35	0.0361	0.15	Q	.	.	.	.
3.53	0.0383	0.15	Q	.	.	.	.
3.72	0.0405	0.15	Q	.	.	.	.
3.90	0.0428	0.15	Q	.	.	.	.
4.08	0.0451	0.15	Q	.	.	.	.

25-YEAR, 24-HOUR: PROPOSED CONDITIONS

4.27	0.0474	0.15	Q	.	.	.	.
4.45	0.0497	0.16	Q	.	.	.	.
4.63	0.0521	0.16	Q	.	.	.	.
4.82	0.0545	0.16	Q	.	.	.	.
5.00	0.0569	0.16	Q	.	.	.	.
5.18	0.0593	0.16	Q	.	.	.	.
5.37	0.0618	0.16	Q	.	.	.	.
5.55	0.0643	0.17	Q	.	.	.	.
5.73	0.0668	0.17	Q	.	.	.	.
5.92	0.0693	0.17	Q	.	.	.	.
6.10	0.0719	0.17	Q	.	.	.	.
6.28	0.0745	0.17	Q	.	.	.	.
6.47	0.0771	0.17	Q	.	.	.	.
6.65	0.0798	0.18	Q	.	.	.	.
6.83	0.0825	0.18	Q	.	.	.	.
7.02	0.0852	0.18	Q	.	.	.	.
7.20	0.0880	0.18	Q	.	.	.	.
7.38	0.0908	0.19	Q	.	.	.	.
7.57	0.0936	0.19	Q	.	.	.	.
7.75	0.0965	0.19	Q	.	.	.	.
7.93	0.0994	0.19	Q	.	.	.	.
8.12	0.1024	0.20	Q	.	.	.	.
8.30	0.1054	0.20	Q	.	.	.	.
8.48	0.1084	0.20	Q	.	.	.	.
8.67	0.1115	0.21	Q	.	.	.	.
8.85	0.1146	0.21	Q	.	.	.	.
9.03	0.1178	0.21	Q	.	.	.	.
9.22	0.1211	0.22	Q	.	.	.	.
9.40	0.1244	0.22	Q	.	.	.	.
9.58	0.1277	0.22	Q	.	.	.	.
9.77	0.1312	0.23	Q	.	.	.	.
9.95	0.1346	0.23	Q	.	.	.	.
10.13	0.1382	0.24	Q	.	.	.	.
10.32	0.1418	0.24	Q	.	.	.	.
10.50	0.1455	0.25	Q	.	.	.	.
10.68	0.1493	0.25	.Q	.	.	.	.
10.87	0.1531	0.26	.Q	.	.	.	.
11.05	0.1570	0.26	.Q	.	.	.	.
11.23	0.1611	0.27	.Q	.	.	.	.
11.42	0.1652	0.28	.Q	.	.	.	.
11.60	0.1694	0.28	.Q	.	.	.	.
11.78	0.1737	0.29	.Q	.	.	.	.
11.97	0.1782	0.30	.Q	.	.	.	.
12.15	0.1833	0.38	.Q	.	.	.	.
12.33	0.1893	0.41	.Q	.	.	.	.
12.52	0.1957	0.43	.Q	.	.	.	.
12.70	0.2023	0.44	.Q	.	.	.	.
12.88	0.2090	0.45	.Q	.	.	.	.
13.07	0.2159	0.46	.Q	.	.	.	.
13.25	0.2231	0.48	.Q	.	.	.	.

13.43	0.2304	0.49	.Q	.	.	.	.
13.62	0.2381	0.52	. Q	.	.	.	.
13.80	0.2460	0.53	. Q	.	.	.	.
13.98	0.2543	0.56	. Q	.	.	.	.
14.17	0.2629	0.58	. Q	.	.	.	.
14.35	0.2719	0.61	. Q	.	.	.	.
14.53	0.2813	0.63	. Q	.	.	.	.
14.72	0.2914	0.69	. Q	.	.	.	.
14.90	0.3021	0.72	. Q	.	.	.	.
15.08	0.3137	0.81	. Q	.	.	.	.
15.27	0.3264	0.86	. Q	.	.	.	.
15.45	0.3401	0.94	. Q	.	.	.	.
15.63	0.3546	0.97	. Q	.	.	.	.
15.82	0.3730	1.46	. Q	.	.	.	.
16.00	0.3996	2.06	. Q	.	.	.	.
16.18	0.4622	6.19	.	.	. Q	.	.
16.37	0.5176	1.13	. Q	.	.	.	.
16.55	0.5332	0.93	. Q	.	.	.	.
16.73	0.5461	0.76	. Q	.	.	.	.
16.92	0.5568	0.66	. Q	.	.	.	.
17.10	0.5663	0.59	. Q	.	.	.	.
17.28	0.5749	0.55	. Q	.	.	.	.
17.47	0.5829	0.50	. Q	.	.	.	.
17.65	0.5903	0.47	.Q	.	.	.	.
17.83	0.5972	0.44	.Q	.	.	.	.
18.02	0.6038	0.42	.Q	.	.	.	.
18.20	0.6092	0.30	.Q	.	.	.	.
18.38	0.6137	0.29	.Q	.	.	.	.
18.57	0.6179	0.27	.Q	.	.	.	.
18.75	0.6219	0.26	.Q	.	.	.	.
18.93	0.6258	0.25	Q	.	.	.	.
19.12	0.6295	0.24	Q	.	.	.	.
19.30	0.6330	0.23	Q	.	.	.	.
19.48	0.6364	0.22	Q	.	.	.	.
19.67	0.6397	0.21	Q	.	.	.	.
19.85	0.6429	0.21	Q	.	.	.	.
20.03	0.6460	0.20	Q	.	.	.	.
20.22	0.6490	0.20	Q	.	.	.	.
20.40	0.6520	0.19	Q	.	.	.	.
20.58	0.6548	0.18	Q	.	.	.	.
20.77	0.6576	0.18	Q	.	.	.	.
20.95	0.6603	0.18	Q	.	.	.	.
21.13	0.6629	0.17	Q	.	.	.	.
21.32	0.6655	0.17	Q	.	.	.	.
21.50	0.6680	0.16	Q	.	.	.	.
21.68	0.6704	0.16	Q	.	.	.	.
21.87	0.6728	0.16	Q	.	.	.	.
22.05	0.6752	0.15	Q	.	.	.	.
22.23	0.6775	0.15	Q	.	.	.	.
22.42	0.6798	0.15	Q	.	.	.	.

22.60	0.6820	0.15	Q	.	.	.	.
22.78	0.6842	0.14	Q	.	.	.	.
22.97	0.6863	0.14	Q	.	.	.	.
23.15	0.6884	0.14	Q	.	.	.	.
23.33	0.6905	0.14	Q	.	.	.	.
23.52	0.6926	0.13	Q	.	.	.	.
23.70	0.6946	0.13	Q	.	.	.	.
23.88	0.6966	0.13	Q	.	.	.	.
24.07	0.6985	0.13	Q	.	.	.	.
24.25	0.6995	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1441.0
10%	154.0
20%	33.0
30%	22.0
40%	11.0
50%	11.0
60%	11.0
70%	11.0
80%	11.0
90%	11.0

100-YEAR, 24-HOUR: PROPOSED CONDITIONS

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 2.30
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.080
LOW LOSS FRACTION = 0.080
TIME OF CONCENTRATION(MIN.) = 11.00
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 100
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.52
30-MINUTE POINT RAINFALL VALUE(INCHES) = 1.09
1-HOUR POINT RAINFALL VALUE(INCHES) = 1.45
3-HOUR POINT RAINFALL VALUE(INCHES) = 2.43
6-HOUR POINT RAINFALL VALUE(INCHES) = 3.36
24-HOUR POINT RAINFALL VALUE(INCHES) = 5.63

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.89
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.18

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.05	0.0000	0.00	Q	.	.	.	.
0.23	0.0013	0.17	Q	.	.	.	.
0.42	0.0038	0.17	Q	.	.	.	.
0.60	0.0064	0.17	Q	.	.	.	.
0.78	0.0089	0.17	Q	.	.	.	.
0.97	0.0115	0.17	Q	.	.	.	.
1.15	0.0141	0.17	Q	.	.	.	.
1.33	0.0168	0.17	Q	.	.	.	.
1.52	0.0194	0.18	Q	.	.	.	.
1.70	0.0221	0.18	Q	.	.	.	.
1.88	0.0248	0.18	Q	.	.	.	.
2.07	0.0275	0.18	Q	.	.	.	.
2.25	0.0303	0.18	Q	.	.	.	.
2.43	0.0330	0.18	Q	.	.	.	.
2.62	0.0358	0.19	Q	.	.	.	.
2.80	0.0386	0.19	Q	.	.	.	.
2.98	0.0415	0.19	Q	.	.	.	.
3.17	0.0443	0.19	Q	.	.	.	.
3.35	0.0472	0.19	Q	.	.	.	.
3.53	0.0501	0.19	Q	.	.	.	.
3.72	0.0531	0.20	Q	.	.	.	.
3.90	0.0560	0.20	Q	.	.	.	.
4.08	0.0590	0.20	Q	.	.	.	.

100-YEAR, 24-HOUR: PROPOSED CONDITIONS

4.27	0.0620	0.20	Q	.	.	.	.
4.45	0.0651	0.20	Q	.	.	.	.
4.63	0.0682	0.20	Q	.	.	.	.
4.82	0.0713	0.21	Q	.	.	.	.
5.00	0.0744	0.21	Q	.	.	.	.
5.18	0.0776	0.21	Q	.	.	.	.
5.37	0.0808	0.21	Q	.	.	.	.
5.55	0.0841	0.22	Q	.	.	.	.
5.73	0.0873	0.22	Q	.	.	.	.
5.92	0.0907	0.22	Q	.	.	.	.
6.10	0.0940	0.22	Q	.	.	.	.
6.28	0.0974	0.23	Q	.	.	.	.
6.47	0.1008	0.23	Q	.	.	.	.
6.65	0.1043	0.23	Q	.	.	.	.
6.83	0.1078	0.23	Q	.	.	.	.
7.02	0.1114	0.24	Q	.	.	.	.
7.20	0.1150	0.24	Q	.	.	.	.
7.38	0.1187	0.24	Q	.	.	.	.
7.57	0.1224	0.25	Q	.	.	.	.
7.75	0.1261	0.25	Q	.	.	.	.
7.93	0.1299	0.25	.Q	.	.	.	.
8.12	0.1338	0.26	.Q	.	.	.	.
8.30	0.1377	0.26	.Q	.	.	.	.
8.48	0.1416	0.26	.Q	.	.	.	.
8.67	0.1457	0.27	.Q	.	.	.	.
8.85	0.1498	0.27	.Q	.	.	.	.
9.03	0.1539	0.28	.Q	.	.	.	.
9.22	0.1581	0.28	.Q	.	.	.	.
9.40	0.1624	0.29	.Q	.	.	.	.
9.58	0.1668	0.29	.Q	.	.	.	.
9.77	0.1713	0.30	.Q	.	.	.	.
9.95	0.1758	0.30	.Q	.	.	.	.
10.13	0.1804	0.31	.Q	.	.	.	.
10.32	0.1851	0.31	.Q	.	.	.	.
10.50	0.1899	0.32	.Q	.	.	.	.
10.68	0.1948	0.33	.Q	.	.	.	.
10.87	0.1998	0.33	.Q	.	.	.	.
11.05	0.2049	0.34	.Q	.	.	.	.
11.23	0.2101	0.35	.Q	.	.	.	.
11.42	0.2155	0.36	.Q	.	.	.	.
11.60	0.2209	0.36	.Q	.	.	.	.
11.78	0.2266	0.38	.Q	.	.	.	.
11.97	0.2323	0.38	.Q	.	.	.	.
12.15	0.2388	0.47	.Q	.	.	.	.
12.33	0.2463	0.51	. Q	.	.	.	.
12.52	0.2541	0.53	. Q	.	.	.	.
12.70	0.2622	0.54	. Q	.	.	.	.
12.88	0.2705	0.56	. Q	.	.	.	.
13.07	0.2790	0.57	. Q	.	.	.	.
13.25	0.2878	0.59	. Q	.	.	.	.

100-YEAR, 24-HOUR: PROPOSED CONDITIONS

13.43	0.2969	0.61	. Q	.	.	.	.
13.62	0.3064	0.64	. Q	.	.	.	.
13.80	0.3162	0.66	. Q	.	.	.	.
13.98	0.3265	0.70	. Q	.	.	.	.
14.17	0.3372	0.72	. Q	.	.	.	.
14.35	0.3485	0.77	. Q	.	.	.	.
14.53	0.3604	0.80	. Q	.	.	.	.
14.72	0.3731	0.87	. Q	.	.	.	.
14.90	0.3867	0.92	. Q	.	.	.	.
15.08	0.4014	1.03	. Q	.	.	.	.
15.27	0.4175	1.10	. Q	.	.	.	.
15.45	0.4351	1.22	. Q	.	.	.	.
15.63	0.4540	1.28	. Q	.	.	.	.
15.82	0.4774	1.81	. Q	.	.	.	.
16.00	0.5103	2.53	. Q	.	.	.	.
16.18	0.5898	7.97	.	.	.	.Q	.
16.37	0.6614	1.48	. Q	.	.	.	.
16.55	0.6816	1.18	. Q	.	.	.	.
16.73	0.6979	0.97	. Q	.	.	.	.
16.92	0.7115	0.84	. Q	.	.	.	.
17.10	0.7235	0.75	. Q	.	.	.	.
17.28	0.7343	0.68	. Q	.	.	.	.
17.47	0.7441	0.62	. Q	.	.	.	.
17.65	0.7533	0.58	. Q	.	.	.	.
17.83	0.7618	0.55	. Q	.	.	.	.
18.02	0.7699	0.52	. Q	.	.	.	.
18.20	0.7768	0.39	.Q	.	.	.	.
18.38	0.7825	0.37	.Q	.	.	.	.
18.57	0.7880	0.35	.Q	.	.	.	.
18.75	0.7933	0.34	.Q	.	.	.	.
18.93	0.7983	0.32	.Q	.	.	.	.
19.12	0.8031	0.31	.Q	.	.	.	.
19.30	0.8077	0.30	.Q	.	.	.	.
19.48	0.8121	0.29	.Q	.	.	.	.
19.67	0.8164	0.28	.Q	.	.	.	.
19.85	0.8206	0.27	.Q	.	.	.	.
20.03	0.8246	0.26	.Q	.	.	.	.
20.22	0.8285	0.25	.Q	.	.	.	.
20.40	0.8323	0.25	Q	.	.	.	.
20.58	0.8360	0.24	Q	.	.	.	.
20.77	0.8396	0.23	Q	.	.	.	.
20.95	0.8431	0.23	Q	.	.	.	.
21.13	0.8466	0.22	Q	.	.	.	.
21.32	0.8499	0.22	Q	.	.	.	.
21.50	0.8532	0.21	Q	.	.	.	.
21.68	0.8564	0.21	Q	.	.	.	.
21.87	0.8596	0.21	Q	.	.	.	.
22.05	0.8626	0.20	Q	.	.	.	.
22.23	0.8657	0.20	Q	.	.	.	.
22.42	0.8686	0.19	Q	.	.	.	.

22.60	0.8715	0.19	Q	.	.	.	.
22.78	0.8744	0.19	Q	.	.	.	.
22.97	0.8772	0.18	Q	.	.	.	.
23.15	0.8800	0.18	Q	.	.	.	.
23.33	0.8827	0.18	Q	.	.	.	.
23.52	0.8854	0.18	Q	.	.	.	.
23.70	0.8880	0.17	Q	.	.	.	.
23.88	0.8906	0.17	Q	.	.	.	.
24.07	0.8932	0.17	Q	.	.	.	.
24.25	0.8944	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1441.0
10%	154.0
20%	33.0
30%	22.0
40%	11.0
50%	11.0
60%	11.0
70%	11.0
80%	11.0
90%	11.0

APPENDIX F: NOISE IMPACT STUDY

Noise Impact Study for Bowerman Power RNG Plant

Bowerman Power LFG, LLC

11006 Bee Canyon Access Road
Irvine, CA 92602

May 2024

Prepared by:

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Noise Impact Study for Bowerman Power RNG Plant

Prepared for:

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11006 Bee Canyon Access Road
Irvine, CA 92602

May 2024

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List of Acronyms and Abbreviations

BP	Bowerman Power LFG, LLC
BMP	Best Management Practices
CalEEMod	California Emissions Estimator Model®
CNEL	Community Noise Equivalent Level
CO_2	Carbon Dioxide
dB	Decibel
dBA	A-Weighted Decibel
DOT	[United States] Department of Transportation
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
FRB	Frank R. Bowerman [Landfill]
FTA	Federal Transit Administration
hp	Horsepower
Hz	Hertz
in/sec	Inches per Second
ISO	International Organization for Standardization
L_{dn}	Day-Night Noise Level
L_{eq}	Equivalent Energy Level
L_{max}	Maximum Level of Noise
LFG	Landfill Gas
MSW	Municipal Solid Waste
N_2	Nitrogen
OCWR	Orange County Waste & Recycling
OPR	[California] Office of Planning and Research
PPV	Peak Particle Velocity
RMS	Root Mean Squared
RNG	Renewable Natural Gas
SoCalGas	Southern California Gas Company

Noise Impact Study for Bowerman Power RNG Plant

1.0 INTRODUCTION

1.1 Purpose and Objectives

Yorke Engineering, LLC (Yorke) has been retained by Bowerman Power LFG, LLC (BP) to complete a Noise Impact Study for the proposed Bowerman Renewable Natural Gas (RNG) Plant planned at the Frank R. Bowerman (FRB) Landfill in County of Orange, California (Project). The FRB Landfill is a state-of-the-art, Class III, municipal solid waste (MSW) landfill. The project is being conducted under a partnership agreement between BP and Orange County Waste & Recycling (OCWR) to process the landfill gas (LFG) produced by the Bowerman Landfill. The proposed RNG Plant will be designed to process a portion of the excess LFG that is produced by the Bowerman Landfill (i.e., produce RNG from LFG) and deliver it to a new 12-inch diameter the Southern California Gas Company (SoCalGas) pipeline connecting the processing plant to an existing SoCalGas pipeline at the corner of Portola Parkway and Jeffrey Road near the Project site.

BP requested Yorke's support to perform ambient noise measurements in the vicinity, assess the noise impacts of the proposed project on the nearby properties, and propose noise control measures, if applicable.

Yorke has evaluated the potential for adverse noise impacts on nearest residential receptors during construction and operation of the proposed project. This report contains:

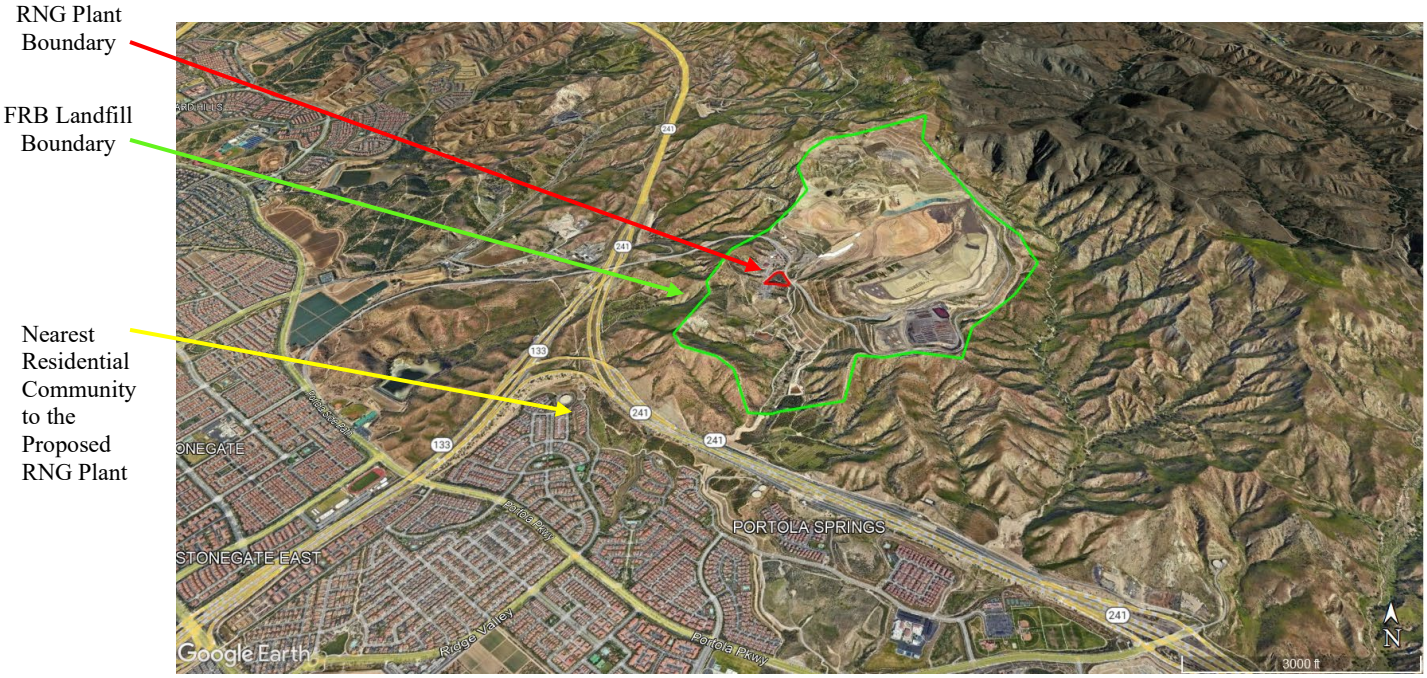
- A review of the State of California 2017 General Plan Guidelines;
- A review of the Orange County General Plan and Municipal Noise Ordinance;
- A review of the City of Irvine's General Plan and Municipal Noise Ordinance;
- The results of ambient noise measurements taken on June 20, 2023;
- A screening-level noise and vibration impacts analysis for project construction;
- Acoustical modeling results for the operational phase of the project; and
- A noise data analysis.

1.2 Facility Description, Location, and Zoning

The proposed site is located at 11006 Bee Canyon Access Road in Irvine, CA, which is within the jurisdiction of the County of Orange (the County). The facility is located in the unincorporated General Agricultural, Citrus Rural District (A1) zone. The nearest sensitive receptors are homes located in the City of Irvine, Portola Springs neighborhood, generally south of the Project site, on the south side of State Route (SR) 241 and east of SR 133.

Figure 1-1 is satellite imagery showing the location of the proposed facility, the surrounding area, highways, and the nearest sensitive receptors.

Figure 1-1: Proposed RNG Plant Location Diagram



The proposed facility will be operating 24 hours per day, 7 days a week. The planned list of noise generating equipment, estimated noise levels, and operational hours of each device are shown in Table 1-1.

The new SoCalGas pipeline will run from the point of interconnect within RNG Plant boundary, down Bee Canyon Access Road to the existing SoCal Gas pipeline on the corner of Portola Parkway and Jeffery Road, as shown in Figure 1-2. The new SoCal Gas pipeline will be approximately 2.0 miles in length along Bee Canyon Access Road and approximately 0.4 miles in length along Portola Parkway, for a total of 2.4 miles.

The Project will be located in unincorporated Orange County within the sphere of influence of the City of Irvine, except for a small portion of the new SoCal Gas pipeline, which will be located within the City of Irvine.

Figure 1-2: Proposed SoCalGas Location Diagram

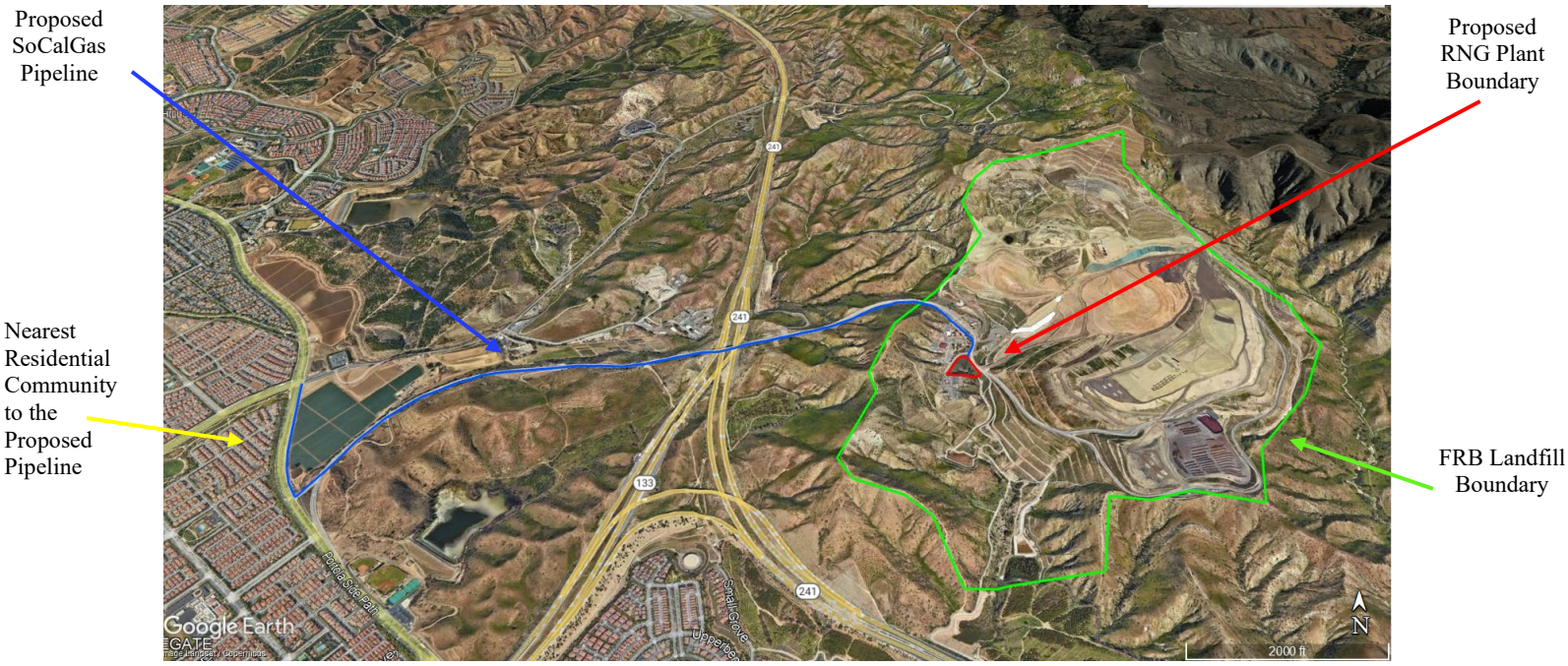


Table 1-1: List of Noise Generating Equipment

Equipment Type	Quantity	Motor Size (hp)	Estimated Sound Pressure Levels per Equipment (dBA)	Operational Hours	Operating Schedule
Feed Compressors	3	600	90 dBA at 10 feet	Continuous	All three compressors will run simultaneously
Feed Compressors Aftercoolers	3	15	95 dBA at 3 feet	Continuous	All three aftercoolers will run simultaneously with feed compressors
Feed Compressors Oil Coolers	3	20	95 dBA at 3 feet	Continuous	All three oil coolers will run simultaneously with feed compressors
Glycol Circulation Pumps	3	~5	85 dBA at 3 feet	Continuous	Pumps run simultaneously with feed compressors
CO_2 Removal Vacuum Compressors	6	250	85 dBA at 3 feet	Continuous	All six compressors will run simultaneously
RNG Product Gas Cooler	1	10	95 dBA at 3 feet	Continuous	Product gas cooler will run constantly
N_2 Removal Vacuum Compressors	3	600	90 dBA at 10 feet	Continuous	All three compressors will run simultaneously
N_2 Removal Vacuum Compressors Oil Coolers	3	15	95 dBA at 3 feet	Continuous	All three oil coolers will run simultaneously with vacuum compressors
N_2 Removal Recycle Compressors	2	600	90 dBA at 10 feet	Continuous	Both compressors will run simultaneously
N_2 Removal Recycle Compressors Aftercoolers	2	10	95 dBA at 3 feet	Continuous	Both aftercoolers will run simultaneously with recycle compressors
N_2 Removal Recycle Compressors Oil Coolers	2	15	90 dBA at 3 feet	Continuous	Both oil coolers will run simultaneously with recycle compressors

Equipment Type	Quantity	Motor Size (hp)	Estimated Sound Pressure Levels per Equipment (dBA)	Operational Hours	Operating Schedule
Product Gas Cooler from EQ PSA	1	7.5	95 dBA at 3 feet	Continuous	Product gas cooler will run constantly
Product Compressors	2	350	100 dBA at 10 feet	Continuous	Both compressors will run simultaneously
Product Compressors Aftercoolers	2	10	95 dBA at 3 feet	Continuous	Both aftercoolers will run simultaneously with product compressors
Thermal Oxidizer Blower	1	30	100 dBA at 3 feet	Continuous	Blower will be running constantly
Thermal Oxidizer Combustion Air Blower	1	15	100 dBA at 3 feet	Continuous	Blower will be running constantly
Flare Combustion Blower	1	250	100 dBA at 3 feet	Intermittent	Blower will only come on during disruptions in product gas quality
Instrument Air Compressors	2	35	95 dBA at 3 feet	Intermittent	One compressor will be running, one on standby
Ventilation Fans	6	15	85 dBA at 3 feet	Continuous	Fans used for temperature control with process room, highest use during the day in summer
Back Up Generator (inside of a weatherproof steel enclosure)	1	200	100 dBA at 3 feet	Power Outage Only	Generator on standby, only comes on during power disruptions
PSA Vessels (Pressure Changes)	1	N/A	100 dBA at 3 feet	Intermittent	Occurs during cycle changes which varies with time.
CO_2 Removal Vacuum Oil Coolers	3	15	95 dBA at 3 feet	Continuous	All three oil coolers will run simultaneously with CO_2 vacuum compressors

Source: Applicant 2023.

2.0 NOISE AND VIBRATION FUNDAMENTALS

2.1 Definition and Measurement of Noise

Sound is a pressure wave created by a moving or vibrating source that travels through a fluid medium such as air or water. Noise is defined as a sound or aggregated sounds that are perceived as dissonant, irritating, objectionable, intrusive and/or disruptive to the quality of daily life. Sound is measured on a logarithmic scale of sound pressure level known as the decibel (dB) scale. A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency sound sources by discriminating against very low and very high frequencies of the audible spectrum. The dBA scale is weighted to reflect only those frequencies which are audible to the human ear, generally defined as a range of 20 to 20,000 Hertz (Hz). Figure 2-1 presents a range of noise levels associated with common indoor and outdoor activities.

Figure 2-1: Typical Noise Levels and Effects on People

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	70	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60	
		Large business office
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime		
	30	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

Source: California Department of Transportation, Technical Noise Supplement, September 2013.

2.2 Noise Descriptors

Environmental noise descriptors are generally based on time weighted averages, rather than instantaneous noise levels. Noise levels emitted by various sources are often expressed as equivalent energy level (L_{eq}). Maximum Level of Noise (L_{max}) is the root mean squared (RMS) maximum level of a noise source or environment measured on a sound level meter during a designated time interval (e.g., 15, 30, or 60 minutes) using fast meter response.

Because sound levels at a particular location typically vary over the course of the day and because people tend to be more sensitive to noise in the evening and at night than during the morning and afternoon, sound levels are commonly averaged over a 24-hour period, weighted for night and evening sensitivity, and expressed as either Day-Night Noise Level (L_{dn}) or Community Noise Equivalent Level (CNEL). These two expressions of average sound levels are nearly equivalent, and while this Noise Element usually refers to CNEL, standards cited from certain State and federal regulations may use L_{dn}.

2.3 Noise Range

Decibel scales are logarithmic, such that an increase from 30 to 40 dB represents a tenfold increase in sound level, while an increase from 30 to 50 dB represents a hundredfold increase. Human perception of sound loudness, however, is subjective. Everyday sounds normally range from 30 dBA (very quiet, such as a soft whisper) to 100 dBA (very loud, such as the noise produced by a jet takeoff at a distance of 200 feet). In general, noise may become a nuisance at levels of 45 dBA CNEL or greater, e.g., speech interference. Psychological and physiological stress are common with noise levels in the 65 to 75 dBA CNEL range, and hearing loss can occur at sustained noise levels of 75 dBA CNEL or more (Jansen 1969).

2.4 Sound Propagation

Sound is transmitted in air by pressure variations from its source to the surroundings. Sound levels will decrease exponentially as the inverse square of the distance between the source and the receiver (receptor) increases, i.e., exclusive of other physical factors, doubling the distance from a source decreases the sound intensity by a factor of four. While absorption by air is one of the factors attributing to the weakening of a sound during transmission, distance plays a more important role in noise reduction during transmission. Depending on the source of the sound, for every doubling of distance, the level will be reduced between 3 and 6 dB. The reduction of a sound is called attenuation. Other factors for noise attenuation are terrain absorption and shielding (insertion loss).

To attenuate the line-of-sight noise transmission, sound walls between a noise source and a receiver (receptor) are often used for noise control, e.g., along freeways. Additional barriers such as interceding buildings, rough terrain, hills, and heavy vegetation can also reduce noise levels. Typically, sound walls will reduce noise levels by 5 to 10 dB. The higher the wall is, the greater the noise reduction will be. Effective noise barriers can reduce noise levels by 10 to 15 dB. A sound barrier is most effective when placed close to the noise source or receiver.

2.5 Vibration Transmission

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods employed. Operation of construction equipment can cause vibrations that spread through the ground that diminish in strength with distance, similar to sound attenuation. While such ground-borne vibration is not a threat to humans or animals, buildings founded on the soil near a construction site may respond to these vibrations with varying effects, ranging from no perceptible effects at the lowest levels, low rumbling sounds and perceptible vibrations at moderate levels, and slight damage at the highest levels. Vibration amplitudes are usually expressed in peak particle velocity (PPV) or RMS vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is the maximum instantaneous positive or negative

peak of the vibration signal. PPV is often used in monitoring of construction vibration since it is related to the stresses that are experienced by buildings and is not used to evaluate human response.

3.0 NOISE STANDARDS

3.1 State of California 2017 General Plan Guidelines

The California Governor's Office of Planning and Research's noise element guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise, e.g., residential next to industrial. The guidelines contain a table that describes the compatibility of various land uses with a range of environmental noise levels in terms of CNEL. Table 3-1, Land Use Compatibility for Community Noise Environments, reproduces the guidelines for determining acceptable and unacceptable community noise exposure limits for various land use categories. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

Table 3-1: State of California Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure (L_{dn} or CNEL, dBA)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential – Low Density, Single-Family, Duplex, Mobile Homes	50-60	55-70	70-75	75-85
Residential – Multiple Family	50-65	60-70	70-75	70-85
Transient Lodging – Motel, Hotels	50-65	60-70	70-80	80-85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-70	60-70	70-80	80-85
Auditoriums, Concert Halls, Amphitheaters	NA	50-70	NA	65-85
Sports Arenas, Outdoor Spectator Sports	NA	50-75	NA	70-85
Playgrounds, Neighborhood Parks	50-70	NA	65-75	75-85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50-70	NA	70-80	80-85
Office Buildings, Business Commercial and Professional	50-70	65-75	75-85	NA
Industrial, Manufacturing, Utilities, Agriculture	50-75	70-80	75-85	NA

Source: California Governor's Office of Planning and Research (OPR) 2017.

3.2 County of Orange General Plan, Noise Element

The Noise Element of the Orange County General Plan contains information that relates to the noise environment in the unincorporated areas of Orange County. Specifically, this Noise Element responds to the requirements of Section 65302(f) of the California Government Code. The purpose of the Noise Element is to provide a statement of public policy and a decision framework for the

maintenance of a quiet environment. Table 3-2 characterizes land uses in terms of noise sensitivity. For the purpose of complying with the Table 3-2 criteria, the noise from all sources will be combined and rated in terms of CNEL. See Table 3-3 for definitions of the entries in Table 3-2.

Table 3-2: Orange County Compatibility Matrix for Land Use and Community Noise Equivalent Level (CNEL)

	65+ decibels CNEL	60 to 65 decibels CNEL
TYPE OF USE		
Residential	3a, b, e	2a, e
Commercial	2c	2c
Employment	2c	2c
Open Space		
Local	2c	2c
Community	2c	2c
Regional	2c	2c
Educational Facilities		
Schools (K through 12)	2c, d, e	2c, d, e
Preschool, college, other	2c, d, e	2c, d, e
Places of Worship	2c, d, e	2c, d, e
Hospitals		
General	2a, c, d, e	2a, c, d, e
Convalescent	2a, c, d, e	2a, c, d, e
Group Quarters	1a, b, c, e	2a, c, e
Hotel / Motels	2a, c	2a, c
Accessory Uses		
Executive Apartments	1a, b, e	2a, e
Caretakers	1a, b, c, e	2a, c, e

Source: Orange County General Plan, Noise Element.

Table 3-3: Explanation and Definition on Table 3-2

ACTION REQUIRED TO ENSURE COMPATIBILITY
BETWEEN LAND USE AND NOISE FROM EXTERNAL SOURCES

1 = Allowed if interior and exterior community noise levels can be mitigated.
2 = Allowed if interior levels can be mitigated.
3 = New residential uses are prohibited in areas within the 65-decibel CNEL contour from any airport of air station; allowed in other areas if interior and exterior community noise levels can be mitigated. The prohibition against new residential development excludes limited "infill" development within an established neighborhood.

STANDARDS REQUIRED FOR COMPATIBILITY OF LAND USE AND NOISE

a = Interior Standard: CNEL of less than 45 decibels (habitable rooms only).
b = Exterior Standard: CNEL of less than 65 decibels in outdoor living areas.
c = Interior Standard: Leq (h)=45 to 65 decibels interior noise level, depending on interior use.
d = Exterior Standard: Leq (h) of less than 65 decibels in outdoor living areas.
e = Interior Standard: As approved by the Board of Supervisors for sound events of short duration such as aircraft flyovers or individual passing railroad trains.

KEY DEFINITIONS

Habitable Room– Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms and similar spaces.

Interior – Spaces that are covered and largely enclosed by walls.

Leq (h) – The A-weighted equivalent sound level averaged over a period of "h" hours. An example would be Leq (12) where the equivalent sound level is the average over a specified 12-hour period (such as 7:00 a.m. to 7:00 p.m.). Typically, time period "h" is defined to match the hours of operation of a given type of use.

Outdoor Living Area – Outdoor living area is a term used by the County of Orange to define spaces that are associated with residential land uses typically used for passive private recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas, and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally used for short-term social gatherings; and outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

Source: Orange County General Plan, Noise Element.

As shown above, the County specifies outdoor and indoor noise limits for residential uses, places of worship, educational facilities, hospitals, hotels/motels, and commercial and other land uses. The noise standard for exterior living areas is 65 dBA CNEL. The indoor noise standard is 45 dBA CNEL, which is consistent with the standard in the California Noise Insulation Standard.

3.3 County of Orange Municipal Code, Noise Control

Section 4-6-1 of the Orange County Municipal Code states that unnecessary, excessive, and annoying sounds emanating from unincorporated areas of the County are prohibited.

3.3.1 Exterior Noise

Per Section 4-6-5 of the Code, the exterior noise standards shown in Table 3-4 apply to all residential properties within a designated noise zone:

Table 3-4: Orange County Exterior Noise Standards

Noise Zone	Noise Levels (dBA)	
	Daytime (7 a.m.-10 p.m.)	Nighttime (10 p.m.-7 a.m.)
1	55	50

The entire territory of Orange County, including incorporated and unincorporated territory, is hereby designated as "Noise Zone 1". In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by 5 dBA.

It is unlawful for any person at any location within the unincorporated area of the County to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, when the foregoing causes the noise level, when measured on any other residential property, either incorporated or unincorporated, to exceed:

- The noise standard for a cumulative period of more than 30 minutes in any hour; or
- The noise standard plus 5 dBA for a cumulative period of more than 15 minutes in any hour; or
- The noise standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour; or
- The noise standard plus 15 dBA for a cumulative period of more than 1 minute in any hour; or
- The noise standard plus 20 dBA for any period of time.

In the event the ambient noise level exceeds any of the first four noise limit categories above, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

3.3.2 Interior Noise

Per Section 4-6-6 of the Code, the interior noise standards shown in Table 3-5 apply to all residential properties within a designated noise zone:

Table 3-5: Orange County Interior Noise Standards

Noise Zone	Noise Levels (dBA)	
	Daytime (7 a.m.-10 p.m.)	Nighttime (10 p.m.-7 a.m.)
1	55	45

In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by 5 dBA.

It shall be unlawful for any person at any location within the unincorporated area of the County to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, when the foregoing causes the noise level, when measured within any other dwelling unit on any residential property, either incorporated or unincorporated, to exceed:

- The interior noise standard for a cumulative period of more than 5 minutes in any hour; or
- The interior noise standard plus 5 dBA for a cumulative period of more than 1 minute in any hour; or
- The interior noise standard plus 10 dBA for any period of time.

In the event the ambient noise level exceeds either of the first two noise limit categories above, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event the ambient noise level exceeds the third noise limit category, the maximum allowable noise level under said category shall be increased in reflect the maximum ambient noise level.

3.4 City of Irvine General Plan Noise Element

Since the nearest sensitive receptors are in Irvine, CA, the City of Irvine General Plan was also reviewed.

The City's interior and exterior noise standards are shown on Table 3-6. Table 3-7 shows each land use category and the CNEL which is compatible with the uses in the category.

Table 3-6: City of Irvine Interior and Exterior Noise Standards Energy Average (CNEL)

LAND USE CATEGORIES		ENERGY AVERAGE (CNEL)	
CATEGORIES	USES	INTERIOR[1]	EXTERIOR[2]
RESIDENTIAL	Single-Family Multiple-Family	45[3] 55[4]	65[7]
	Mobile Home	_____	65[5]
COMMERCIAL/ INDUSTRIAL	Hotel, motel, transient lodging	45	65[6]
	Commercial, retail, bank, restaurant	55	_____
	Office building, professional office, research & development	50	_____
	Amphitheater, concert hall, auditorium, meeting hall	45	_____
	Gymnasium (Multipurpose)	50	_____
	Health clubs	55	_____
	Manufacturing, warehousing, wholesale, utilities	65	_____
	Movie theater	45	_____
INSTITUTIONAL	Hospital, school classroom	45	65
	Church, library	45	_____
OPEN SPACE	Parks	_____	65

Interpretation:

1. Interior environment excludes bathrooms, toilets, closets, and corridors.
2. Outdoor environment limited to private yard of single-family or multi-family residences private patio which is accessed by a means of exit from inside the unit; mobile home park; hospital patio; park picnic area; school playground; and hotel and motel recreation area.
3. Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided pursuant to Appendix Chapter 12, Section 1208 of UBC.
4. Noise level requirement with open windows if they are used to meet natural ventilation requirement.
5. Exterior noise level shall be such that interior noise level will not exceed 45 CNEL.
6. Except those areas affected by aircraft noise.
7. Multi-family developments with balconies that do not meet the 65 CNEL are required to provide occupancy disclosure notices to all future tenants regarding potential noise impacts.

Source: City of Irvine General Plan, Noise Element.

Table 3-7: City of Irvine Land Use Noise Compatibility

LAND USE CATEGORIES		ENERGY AVERAGE (CNEL)						
Categories	Uses	<	55	60	65	70	75	80>
RESIDENTIAL	Single-Family	A	A	B	B	C	D	D
RESIDENTIAL	Mobile Home	A	A	B	C	C	D	D
COMMERCIAL Regional	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
COMMERCIAL Regional Community	Commercial retail, Bank, Restaurant, Movie theater	A	A	A	A	B	B	C
COMMERCIAL Community INDUSTRIAL & INSTITUTIONAL	Office building, Research & development Professional office, City office building	A	A	A	B	B	C	D
COMMERCIAL Recreation INSTITUTIONAL General	Amphitheater, Concert hall Auditorium, Meeting hall	B	B	C	C	D	D	D
COMMERCIAL Recreation	Children's amusement park, Miniature golf, Go-cart track, Health club, Equestrian center	A	A	A	B	B	D	D
COMMERCIAL Community INDUSTRIAL General	Automobile service station, Auto dealer, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
INSTITUTIONAL General	Hospital, Church, Library, School classrooms	A	A	B	C	C	D	D
OPEN SPACE	Parks	A	A	A	B	C	D	D
OPEN SPACE	Golf courses, Nature centers, Cemeteries, Wildlife reserves, Wildlife habitat	A	A	A	A	B	C	C
AGRICULTURAL	Agriculture	A	A	A	A	A	A	A

Interpretation

Zone A: Clearly Compatible: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Zone B: Normally Compatible: New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Zone C: Normally Incompatible: New construction or development should normally be discouraged. If new construction or development does proceed, a detailed analysis or noise reduction requirements must be made and needed noise insulation features must be included in the design.

Zone D: Clearly Incompatible: New construction or development should generally not be undertaken.

Source: City of Irvine General Plan, Noise Element.

3.5 City of Irvine Municipal Code Noise Ordinance

Since the nearest sensitive receptors are within the city limits of Irvine, the City of Irvine Noise Ordinance was also reviewed.

All hospitals, libraries, churches, schools, and residential properties are considered Noise Zone 1.

Section 6-8-204 of the Ordinance states that the following noise standards apply to all properties within a noise zone 1.

Table 3-8: City of Irvine Noise Standards

Interior/ Exterior	Time Period	30 mins/hr	15 mins/hr	5 mins/hr	1 min/hr	0 (anytime)
Exterior	7 a.m.-10 p.m.	55	60	65	70	75
Interior	10 p.m.- 7 a.m.	50	55	60	65	70

Each of the noise standards specified above shall be reduced by 5 dBA for impact or predominant tone noise.

Section 6-8-205 of the Ordinance states that construction activities may occur between 7:00 a.m. and 7:00 p.m. Mondays through Fridays, and 9:00 a.m. and 6:00 p.m. on Saturdays. No construction activities shall be permitted outside of these hours or on Sundays and federal holidays, except Columbus Day, unless a temporary waiver is granted by the Chief Building Official or his or her authorized representative. Trucks, vehicles, and equipment that are making or are involved with material deliveries, loading, or transfer of materials; equipment service; or maintenance of any devices or appurtenances for or within any construction project in the City shall not be operated or driven on City streets outside of these hours or on Sundays and federal holidays unless a temporary waiver is granted by the City. Any waiver granted shall take impact upon the community into consideration. No construction activity will be permitted outside of these hours except in emergencies, including maintenance work on the City rights-of-way that might be required.

4.0 EXISTING LAND USES AND SENSITIVE RECEPTORS

4.1 Sensitive Receptors

Sensitive noise receptors (receivers) are defined as types of uses that are interrupted by relatively low levels of noise. Such receptors include residential uses, schools, hospitals, places of worship, and similar uses.

4.2 Surrounding Land Uses

The proposed facility is bordered by the LFG-fired electric power generation facility (i.e., LFG to energy facility) and the BP Flare Station to the south, the OCWR FRB Landfill operations buildings to the west and north, and the FRB Landfill to the east. The nearest sensitive receptor area is the Portola Springs residential community of single-family homes located approximately 4,200 feet (0.8 miles) south of the proposed RNG Plant and 230 feet south of the SoCalGas pipeline, in the City of Irvine.

Sharp terrain characterizes the general area around the proposed site. Salient hills stand between the project site and the residential development, rising more than 100 feet above the project site and more than 400 feet above the residential area. This elevated terrain provides a substantial natural noise barrier between the project site and the residences. Furthermore, the northern part of the residential development is bounded by two major highways, SR 133 and SR 241, which are closer and less shielded major noise sources compared to the project site.

5.0 EXISTING AMBIENT NOISE ENVIRONMENT

5.1 Background Noise Measurements

On June 20, 2023, Yorke conducted short-term noise measurements at four locations in the vicinity of the project site as indicated on Figure 5-1. Several studies investigating short-term versus long-term measurements have reported that such short-term measurements can be representative for the long-term. This applies especially if there is a rather constant distribution of noise. A Quest SoundPro SE/DL Type 2 sound level meter was used to document the noise levels. Location 1 represents the existing ambient noise levels at the proposed site. Locations 2 through 4 represent the residences to the south. Table 5-1 summarizes the results of the short-term measurements for each of the locations and time periods. Field notes and raw noise meter data are provided in Appendices A and B, respectively.

Figure 5-1: Noise Measurement Locations

Table 5-1: Summary of Noise Measurements

Sample Location	Sample No.	Meter Sample ID	Time On	Time Off	L_{eq} (dBA)	L_{max} (dBA)	Descriptions
Location 1 SL#1	1	S172	8:16	8:36	63.1	74.6	Daytime noise measurement: ▪ Occasional trucks passing by from OCWR in the distance for the landfill close by, sounds of trucks dumping; ▪ Whirring noise from the FRB Landfill; ▪ 8:25 a.m. sound of birds chirping overhead; ▪ 8:29 a.m. multiple trucks passing by in the distance at once.
	5	S178	22:07	22:27	62.8	64.9	Nighttime noise measurement: ▪ Noticeably more buzzing and chirping coming from the insects in the surrounding foliage; ▪ No truck activity on site, only occasional sound of cars from the freeway.
Location 2 SL#2	2	S174	9:17	9:37	42.0	59.8	Daytime noise measurement: ▪ Throughout measurement, there was ambient noise coming from birds chirping, whirring of cars passing by, workers in the area doing yard work for the surrounding apartments; ▪ Throughout measurement, resident at closest apartment was audibly making noise in home; ▪ 9:25 a.m. louder more noticeable sounds of insects; ▪ 9:27 a.m. and 9:31 a.m. loud sound occurred from resident.
	6	S181	23:49	0:09	38.2	59.6	Nighttime noise measurement: ▪ 11:50 p.m. sound of car driving by; ▪ 11:51 p.m. family making sound outside, being dropped off; ▪ 11:57 p.m. sound of slamming car doors; ▪ 12:01 a.m. -12:05 a.m., dog barking.

Sample Location	Sample No.	Meter Sample ID	Time On	Time Off	L_{eq} (dBA)	L_{max} (dBA)	Descriptions
Location 3 SL#3	3	S176	10:41	11:01	47.3	65.3	Daytime noise measurement: ▪ Lawn maintenance being done in the distance; ▪ Sounds of birds chirping in the brush; ▪ 10:44 a.m. sound of garbage truck reversing; ▪ 10:47 a.m. another garbage truck; ▪ 10:51 a.m. birds chirping in the tree above where sound measurements being taken; ▪ 10:56 a.m. and 11:01 a.m. sounds of car passing by.
	7	S180	23:20	23:40	38.9	50.7	Nighttime noise measurement: ▪ No more lawn maintenance or garbage truck activity; ▪ Sounds of frogs in the distance by the water; ▪ 11:34 p.m. sound of resident's Air Conditioning system coming online.
Location 4 SL#4	4	S175	9:54	10:14	48.1	62.7	Daytime noise measurement: ▪ 9:51 a.m. distant conversation being made by residents; ▪ 9:52 a.m. sound of lawn maintenance from hedge trimmer; ▪ 9:55 a.m. helicopter flew by overhead; ▪ 9:56 a.m. sounds of birds chirping; ▪ Occasional sound spikes from cars passing by on the freeway.
	8	S179	22:47	23:07	41.2	54.7	Nighttime noise measurement: ▪ Sounds of insects and occasional vehicles passing by on the freeway; ▪ 10:47 p.m. sound of car door slamming.

6.0 FUTURE COMMUNITY NOISE IMPACTS

6.1 Construction Noise Impacts

6.1.1 Construction Noise Analysis Methodology

The screening-level noise analysis for project construction was completed based on methodology developed by the U.S. Department of Transportation Federal Highway Administration (DOT FHWA) at the John A. Volpe National Transportation Systems Center and other technical references consistent with California Emissions Estimator Model® (CalEEMod) outputs (equipment utilization). The DOT FHWA methodology uses actual noise measurement data collected during the Boston "Big Dig" project (1991-2006) as reference levels for a wide variety of construction equipment in common use, such as on the proposed project.

The FHWA noise model provides relatively conservative predictions because it does not account for site-specific geometry, dimensions of nearby structures, and local environmental conditions that can affect sound transmission, reflection, and attenuation. As a result, actual measured sound levels at receptors may vary somewhat from predictions, typically lower. Additionally, the impacts of noise upon receptors (persons) are subjective because of differences in individual sensitivities and perceptions.

Noise impacts are evaluated against community noise standards contained in the City or County General Plan, Municipal Code, or other State or federal agency as applicable to the vicinity of the project site. Screening-level project-generated noise is evaluated in relation to established thresholds of significance. Additionally, the same methods are used to determine noise impacts on the nearest sensitive receptor. There is no numerical standard in the Municipal Code for construction activities; however, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment provides an 8-hour construction noise level threshold of 80 dBA L_{eq} during the daytime at residential (noise-sensitive) uses and 85 dBA during the daytime at commercial uses. Therefore, noise impacts for the proposed project are evaluated against the FTA noise standards.

During construction activities, the project would generate noise and vibration due to operation of off-road equipment, portable equipment, and vehicles at or near the project site. No strong sources of vibrations (e.g., hard rock-breaking, large pile-driving) are planned to be used during the construction of the RNG facility. A mounted impact hammer (hoe ram), which is a percussive source, may be occasionally used during the pipeline construction, when encountering rocks during trenching. FTA has published standard vibration velocities for construction equipment operations. Generally, a PPV vibration threshold of approximately 0.3 in/sec is sufficient to avoid physical damage to engineered structures (FTA 2018). The types of construction vibration impacts include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Table 6-1 presents average source levels in terms of velocity for different types of construction equipment.

Table 6-1: FTA Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 feet (in/sec)	
Pile Driver (Impact)	Upper Range	1.518
	Typical	0.644
Pile Driver (Sonic)	Upper Range	0.734
	Typical	0.170
Clam Shovel Drop (slurry wall)		0.202
Hydromill (slurry wall)	In Soil	0.008
	In Rock	0.017
Vibratory Roller		0.210
Hoe Ram		0.089
Large Bulldozer		0.089
Caisson Drilling		0.089
Loaded Trucks		0.076
Jackhammer		0.035
Small Bulldozer		0.003

Source: FTA 2018

No significant increase in traffic is expected due to this relatively small project. Since the receptors are near the two highways, the incremental effect of project operation would not be quantifiable against existing traffic noise (background) in the project vicinity (i.e., less than significant impact). Also, since no airport is closer than 2 miles from the project site, evaluation of aircraft noise upon the project is not required.

Traffic disruptions caused by pipeline construction would include the effects of temporary reduced speed limits for safety in work zones, such as lane reductions. Since vehicle speeds would be reduced, traffic noise would also be reduced due to: 1) less wind noise due to reduced velocity; 2) less tire noise due to lower wheel revolutions; and 3) less engine mechanical noise due to lower running speeds. Therefore, traffic disruptions would be expected to result in decreased traffic noise.

6.1.2 Sensitive Receptors

6.1.2.1 RNG Plant

Sensitive receptors that may be affected by the proposed RNG Plant are residences located approximately 0.8 miles south of the site, on the opposite side of SR 241. To assess the potential for short-term construction noise impacts, the nearest residence (SL#4 indicated on Figure 5-1) was used. This receptor represents all the residences located south of the site.

All distances are measured from the project site boundary closest to the edge of the nearby sensitive receptor locations. Other sensitive land uses in the project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance, topography, and the shielding of intervening structures. Attenuation distance is measured in a straight line from the project boundary for each phase to the nearest sensitive receptor location.

6.1.2.2 SoCalGas Pipeline

Construction of the new SoCal Gas pipeline route will take place in the SoCal right-of-way along Bee Canyon Access Road and Portola Parkway. The majority of the pipeline installation construction activities will use open-trench techniques within the paved sections of the roadways with horizontal directional drilling techniques in some locations. The construction work area along the proposed pipelines will be approximately 50 feet wide and the depth of disturbance for trenching activities will average 6 feet. A traffic control plan will be prepared to accommodate this work area corridor along the new SoCal Gas pipeline route. The traffic control plan will require temporary speed limit reductions for safety in work zones.

Sensitive receptors that may be affected by the construction of the proposed pipeline are residences approximately 230 feet south of the project site. To assess the potential for short-term pipeline construction noise impacts, the nearest residence to the pipeline, shown on Figure 1-2 was used. This receptor represents all the residences located south of the site.

All distances are measured from the project site boundary closest to the edge of the nearby sensitive receptor locations. Other sensitive land uses in the project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance, topography, and the shielding of intervening structures. Attenuation distance is measured in a straight line from the project boundary for each phase to the nearest sensitive receptor location.

6.1.3 Construction Noise and Vibration Impacts

Temporary construction noise would be limited to the City of Irvine's allowable daytime construction hours , i.e., between 7:00 a.m. and 7:00 p.m. Mondays through Fridays, and 9:00 a.m. and 6:00 p.m. on Saturdays, and would permanently cease upon completion of construction. Most construction noise would occur during the site preparation, grading, building construction, trenching, and paving phases when heavy equipment would be operating. No demolition is planned for the proposed project.

During each of the six construction phases there would be a different mix of equipment operating, and cumulative noise levels would vary based on the amount of equipment in operation and the location of each activity at the project site. In general, use of off-road equipment and portable equipment would generate noise due to engine mechanicals, engine exhaust, driveline mechanicals, shaft-driven devices and accessories, hydraulics operation, ground friction and displacement, and gravity drops (dumping, unloading).

Based on the information presented in Table 6-1, nearest offsite structures over 1,300 meters (4,200 feet) away from the RNG facility would not be exposed to a PPV of greater than 0.3 in/sec during construction, which is the threshold at which physical damage to engineered buildings may occur. Since no intense percussive actions (e.g., hard rock-breaking, large pile-driving) are planned to occur during the construction of the RNG facility, no strong groundborne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants (the landfill administration office building is over 100 meters away from the construction site). A mounted impact hammer (hoe ram), which is a percussive source, may be occasionally used during the pipeline construction, when encountering rocks during trenching. The PPV at nearest receptors approximately 230 feet from the proposed pipeline, would be about 0.003 in/sec, which is well below the FTA threshold of 0.3 in/sec.

Construction activities typically generate maximum noise levels in the range of 85 to 90 dBA at a distance of 50 feet. Types of equipment (FHWA 2006) to be used during the Project and noise-emitting characteristics (i.e., usage factors, reference dBA, and percussive source) are shown in Table 6-2 consistent with CalEEMod outputs.

The Project is expected to require up to approximately one year of planned work activities (i.e., from mobilization to substantial completion) comprising six construction phases:

1. Site preparation;
2. Grading;
3. Building construction;
4. Paving;
5. Architectural coating; and
6. Trenching and pipeline construction.

Deviations from this schedule would not affect the noise analysis because noise does not persist or accumulate in the environment.

Table 6-2: FHWA Noise Reference Levels and Usage Factors

CalEEMod Construction Detail			FHWA Equipment Type	Ref.	Usage Factor	Ref. Level	Percussive Source
Phase Name	Equipment Description	Qty.			percent	dBA	Yes/No
Site Preparation (1)	Rubber Tired Dozers	3	Dozer (crawler tractor)	1	40%	85	No
	Tractors/Loaders/Backhoes	4	Backhoe (with loader)	1	40%	80	No
Grading (2)	Rubber Tired Dozers	2	Dozer (crawler tractor)	1	40%	85	No
	Tractors/Loaders/Backhoes	2	Backhoe (with loader)	1	40%	80	No
	Cement and Mortar Mixers	1	Drum Mixer	1	50%	80	No
	Sweepers/Scrubbers	1	Vacuum Street Sweeper	1	10%	80	No
	Dumpers/Tenders	10	Dump Truck	1	40%	84	No
	Off-Highway Trucks	1	Water Truck	1	40%	84	No
	Excavators	1	Excavator (hydraulic)	1	40%	85	No
Building Construction (3)	Cranes	2	Crane	1	16%	85	No
	Forklifts	3	Forklift	1	40%	80	No
	Tractors/Loaders/Backhoes	1	Backhoe (with loader)	1	40%	80	No
	Aerial Lifts	1	Man Lift	1	20%	85	No
	Off-Highway Trucks	1	Water Truck	1	40%	84	No
Paving (4)	Tractors/Loaders/Backhoes	1	Backhoe (with loader)	1	40%	80	No
	Pavers	1	Paver (asphalt)	1	50%	85	No
	Paving Equipment	2	Paver (asphalt)	1	50%	85	No
	Rollers	2	Roller	1	20%	85	No
	Cement and Mortar Mixers	2	Drum Mixer	1	50%	80	No
Architectural Coating (5)	Air Compressors	1	Compressor (air)	1	40%	80	No
Trenching and Pipeline Construction (6)	Bore/Drill rigs	1	Drill Rig Horizontal (boring)	1,3,9	100%	85	No
	Excavators	1	Excavator (hydraulic)	1	40%	85	No
	Rubber Tired Dozers	1	Tractor (rubber tire)	1	40%	84	No
	Tractors/Loaders/Backhoes	1	Dozer (crawler tractor)	1	40%	85	No
	Cranes	1	Crane	1	16%	85	No
	Graders	1	Grader	1	40%	85	No
	Other General Industrial Equipment	1	Mounted Impact Hammer (hoe ram)	1	20%	90	Yes
	Air Compressors	1	Compressor (air)	1	40%	80	No
	Other Construction Equipment	1	Crane	1	16%	85	No

Sources: CalEEMod version 2022.1.1.22, FHWA 2006

Table 6-3 shows a comparison of FHWA screening-level estimated daytime exterior noise impacts for peak RNG Plant construction activities at the nearest receptors with respect to the FTA thresholds. If the thresholds are not exceeded, then a project should be considered acceptable, i.e., less than significant.

Table 6-3: Estimated Peak Activity Construction Noise Impacts at the Nearest Sensitive Receptor

Construction Phases	Normal Acceptance Criteria			
	Modeled Noise Level (L_{eq} dBA)[a]	CalEEMod Duration (days)	Significance Threshold (L_{eq} dBA)[b]	Exceeds Threshold? (Yes/No)
Background	48.1	-	-	No
Site Preparation	48.4	11	80	No
Grading	48.9	49	80	No
Building Construction	48.3	185	80	No
Paving	48.5	11	80	No
Architectural Coating	48.1	16	80	No
Pipeline Construction	77.2	240	80	No

Sources: CalEEMod version 2022.1.1.22, FHWA 2006, FTA 2018, Niland & Elam, 2021.

Notes:

a) Includes existing ambient noise level (cumulative impacts)

b) FTA Noise Limits for Construction

As shown in Table 6-3, the aggregated average construction noise would be below the 80 dBA FTA noise level threshold at nearby receptors. Although the estimated noise levels are below the threshold, the project is proposing to install a noise monitoring instrument during the SoCalGas pipeline construction activities, as a Best Management Practice (BMP), to continuously monitor the construction noise levels to ensure that they remain below the 80 dBA threshold. Noise barriers and mufflers may also be installed as additional BMPs. It should be noted that the proposed noise control measures are project design features, i.e., BMPs, and pursuant to CEQA, are not considered mitigations.

6.2 Operational Noise Impacts

6.2.1 Operational Noise Analysis Methodology

The potential noise impacts on the community are associated with the proposed equipment operating on the project site (see Table 1-1).

The project impact evaluation was performed using SoundPlan Essential 5.1, an environmental noise propagation computer program that was developed to assist with noise propagation calculations for major noise sources and projects. The program calculates the sound pressure level at a location utilizing the sound emission properties of the source(s) and environmental propagation factors (sound spreading due to distance, ground affects, barriers, topography, as well as atmospheric attenuation). The program also includes a number of standardized methodologies that can be utilized to quantify the acoustic effect of these environmental factors. The specific standard employed by this program is that described in the International Organization for Standardization (ISO) Standard 9613, "Acoustics – Attenuation of sound

during propagation outdoors." The modeled ambient temperature was 10°C (50°F), and the assumed relative humidity was 70%. The ground absorption value utilized in the model was set to "0" for hard for the project site and existing facility to the south and "0.5" for partially hard and soft ground for the vegetative area (i.e., hills) to the south. The backup generator will be housed inside a sound-attenuated and weatherproof enclosure. Therefore, an insertion loss of 15 dB was applied to the backup generator since it will be located inside a steel weatherproof enclosure with silencing properties.

This study evaluates the acoustical impact of the proposed project on the nearest sensitive receptors and compares it to the ambient noise levels and local noise standard to assess whether any mitigation measure would be necessary to reduce the noise exposure to the community.

This study focuses on the daytime and nighttime noise levels in order to determine the acoustical impact of the project on the closest receptors.

6.2.2 Operational Noise Sources

The main noise source will be noise from motor-driven equipment, such as gas compressors. The expected "worst-case" scenario, with all equipment operating simultaneously, was assumed during both daytime and nighttime hours.

Noise sources were entered in the modeling system as octave band sound power levels based on the sound pressure of the equipment provided by vendors. Sound pressures were then converted to sound powers in SoundPlan. Table 6-4 lists the sound power levels of the proposed equipment.

Table 6-4: Sound Power Levels in Octave Band Format for Proposed Equipment (dBA)

Source name	Sum, Sound Power (dBA)	Octave Band Centre Frequency (Hz), Sound Power Levels (dBA)												
		63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1,000Hz
Back Up Generator	107.2	75.2	78.9	82.3	85.3	88.0	90.5	92.8	94.8	96.6	98.2	99.5	100.6	101.4
CO2 Removal Vacuum Compressor	92.2	60.2	63.9	67.3	70.3	73.0	75.5	77.8	79.8	81.6	83.2	84.5	85.6	86.4
CO2 Removal Vacuum Oil Cooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
Feed Compressor	107.7	75.7	79.4	82.8	85.8	88.5	91.0	93.3	95.3	97.1	98.7	100.0	101.1	101.9
Feed Compressors Aftercooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
Feed Compressors Oil Cooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
Flare Combustion Blower	107.2	75.2	78.9	82.3	85.3	88.0	90.5	92.8	94.8	96.6	98.2	99.5	100.6	101.4
Glycol Circulation Pump	92.2	60.2	63.9	67.3	70.3	73.0	75.5	77.8	79.8	81.6	83.2	84.5	85.6	86.4
Instrument Air Compressor	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
N2 Removal Recycle Compressor	107.7	75.7	79.4	82.8	85.8	88.5	91.0	93.3	95.3	97.1	98.7	100.0	101.1	101.9
N2 Removal Vacuum Compressor	107.7	75.7	79.4	82.8	85.8	88.5	91.0	93.3	95.3	97.1	98.7	100.0	101.1	101.9
N2 Removal Recycle Compressors Aftercooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
N2 Removal Recycle Compressors Oil Cooler	97.2	65.2	68.9	72.3	75.3	78.0	80.5	82.8	84.8	86.6	88.2	89.5	90.6	91.4

Source name	Sum, Sound Power (dBA)	Octave Band Centre Frequency (Hz), Sound Power Levels (dBA)												
		63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1,000Hz
N2 Removal Vacuum Compressors Oil Cooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
Product Compressor	117.7	85.7	89.4	92.8	95.8	98.5	101.0	103.3	105.3	107.1	108.7	110.0	111.1	111.9
Product Gas Cooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
Product Compressors Aftercooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
PSA Vessel	107.2	75.2	78.9	82.3	85.3	88.0	90.5	92.8	94.8	96.6	98.2	99.5	100.6	101.4
RNG Product Gas Cooler	102.2	70.2	73.9	77.3	80.3	83.0	85.5	87.8	89.8	91.6	93.2	94.5	95.6	96.4
Thermal Oxidizer Blower	107.2	75.2	78.9	82.3	85.3	88.0	90.5	92.8	94.8	96.6	98.2	99.5	100.6	101.4
Thermal Oxidizer Combustion Air Blower	107.2	75.2	78.9	82.3	85.3	88.0	90.5	92.8	94.8	96.6	98.2	99.5	100.6	101.4
Ventilation Fan	92.2	60.2	63.9	67.3	70.3	73.0	75.5	77.8	79.8	81.6	83.2	84.5	85.6	86.4

Source: Applicant 2023, SoundPlan Essential 5.1

Notes:

Since no spectral data was available, only the sound power levels, the spectra for only the lower frequency ranges (four octaves) were estimated. The higher frequencies would not carry as far as the lower frequencies, therefore they are not expected to impact the nearest sensitive receptors.

An insertion loss of 15 dB was applied to the backup generator since it will be placed inside a weatherproof enclosure.

6.2.3 Sensitive Receptors

To assess the potential for operational noise impacts, three sensitive receptor (receiver) locations were used as shown on Figure 6-1. These were the same locations at which the ambient noise measurements were taken. The locations of these receptors are denoted by yellow dots in Figure 6-1. Note: Receiver 1 is not a sensitive receptor. Receiver 1 was used to predict the noise levels at the proposed site.

Figure 6-1 shows the future noise level map at the sensitive receptor areas and the property boundaries, including the 55 dBA daytime and 50 dBA nighttime noise limit lines. Figures 6-2 and 6-3 present noise level contours for all hours (daytime, evening, and nighttime) and CNEL, respectively, at the sensitive receptor areas and the property boundaries. Predicted operational noise levels, exclusive of ambient background, are anticipated to range between 25.5-40.4 dBA during the daytime, evening, and nighttime hours at the nearest sensitive receivers without any noise mitigation. Table 6-5 shows the results of the noise level predictions.

Figure 6-1: Operations Noise Levels Projections (dBA)

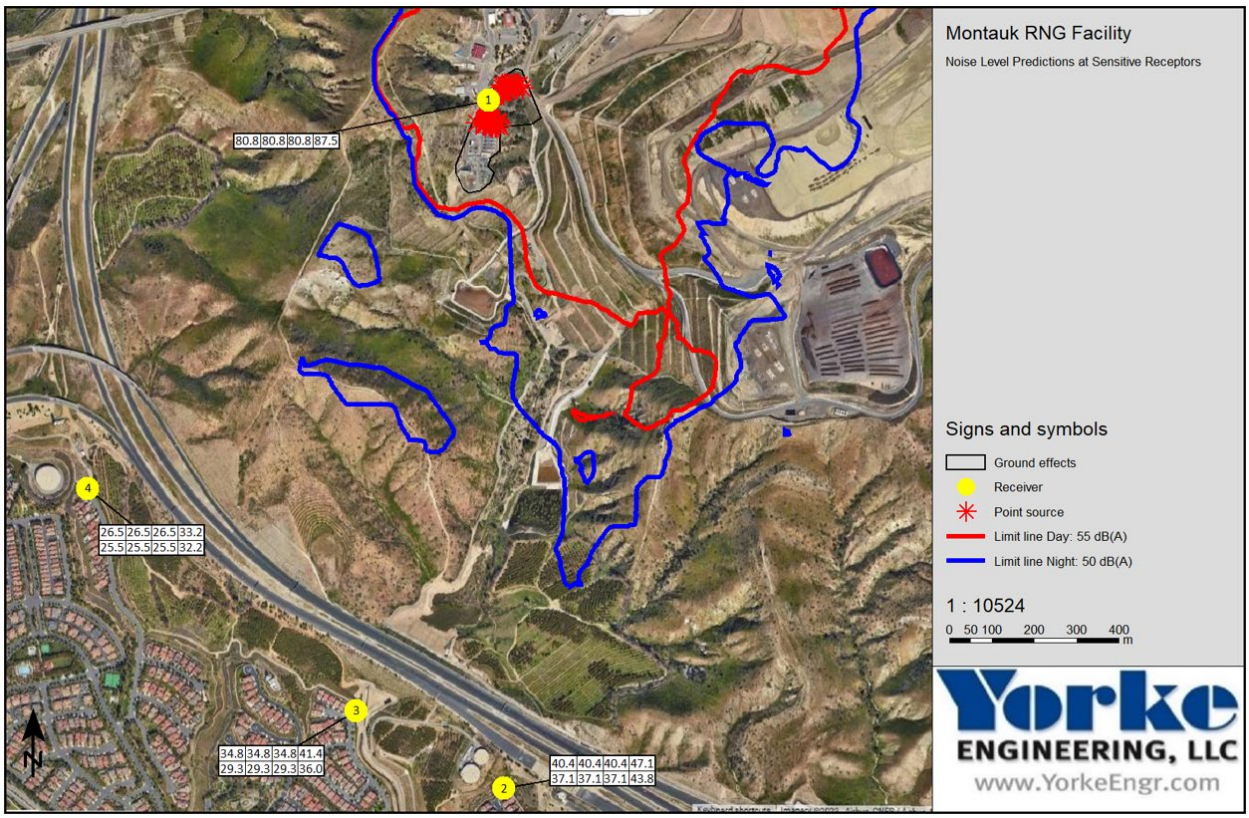


Figure 6-2: Operations Noise Level Contours (dBA)

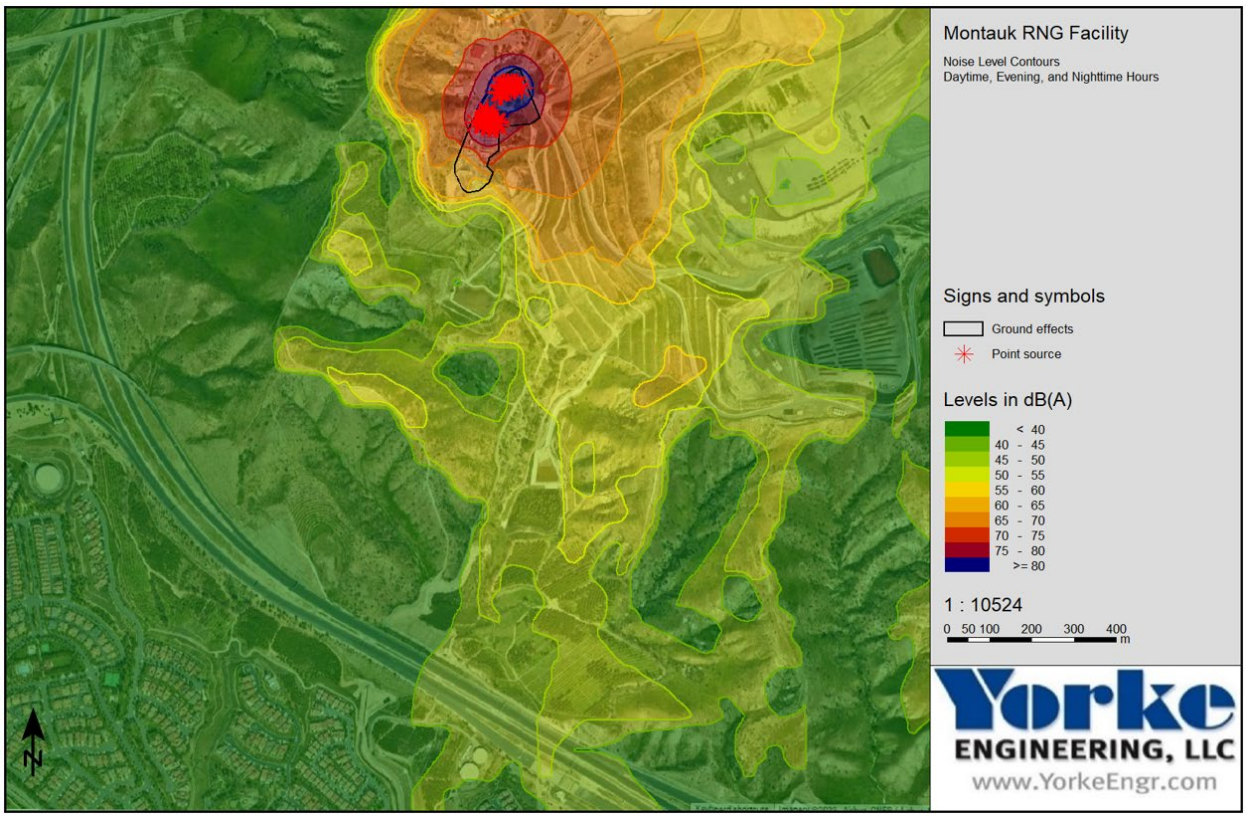


Figure 6-3: Operations Noise Level Contours (CNEL)

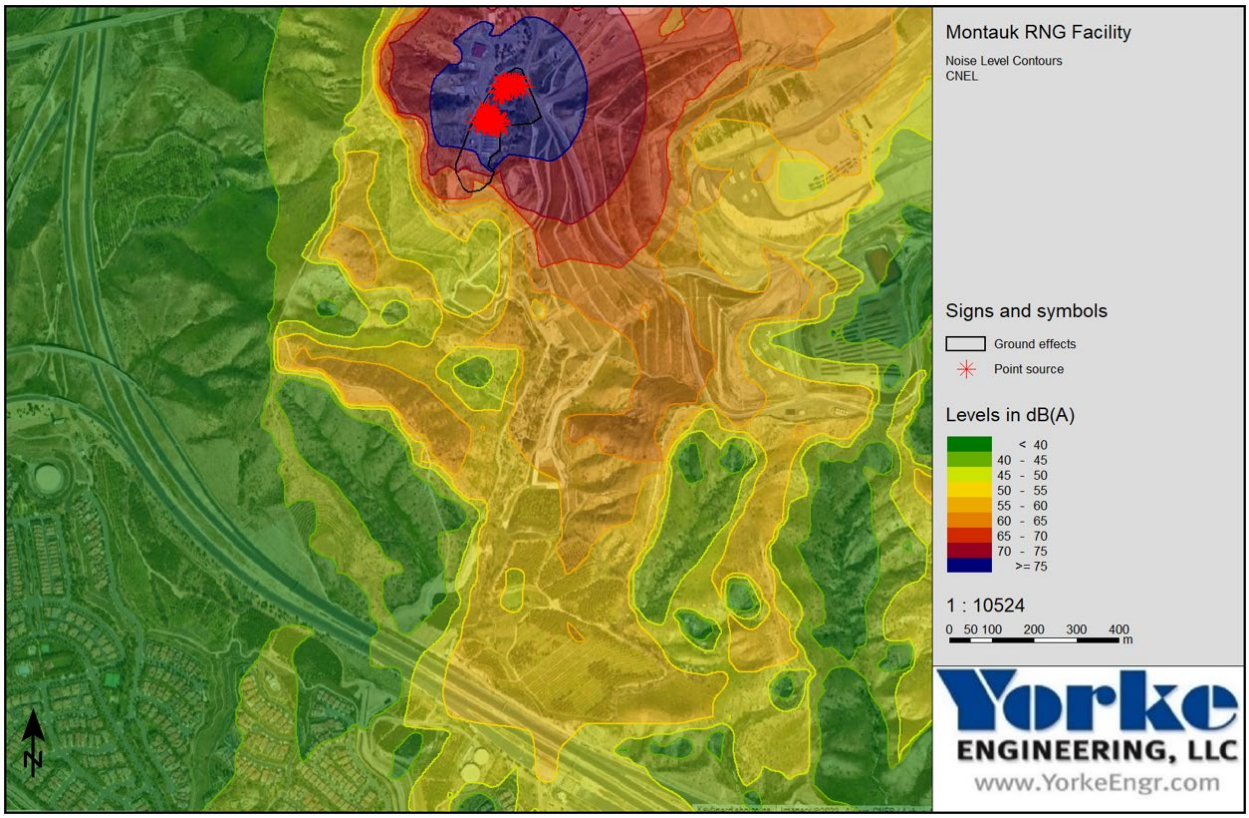


Table 6-5: Receiver Predicted Noise Level Impacts (dBA)

Receiver No.	Receiver Name	Floor	Ambient Noise Levels (dBA)[a]				Predicted Noise Levels (dBA)		Combined Noise Levels (dBA)			Difference between Ambient and Combined (dBA)		
			Daytime	Evening	Nighttime	CNEL	Daytime Evening Nighttime	CNEL	Daytime	Evening	Nighttime	Daytime	Evening	Nighttime
1	Project Site	GF	63.1	63.1	62.8	69.5	80.8	80.8[b]	80.9	80.9	80.9	17.8	17.8	18.1
2	SL#2	GF	42.0	42.0	38.2	45.9	37.1	43.8	43.2	43.2	40.7	1.2	1.2	2.5
2	SL#2	1.Fl	42.0	42.0	38.2	45.9	40.4	47.1	44.3	44.3	42.4	2.3	2.3	4.2
3	SL#3	GF	47.3	47.3	38.9	48.9	29.3	36.0	47.4	47.4	39.3	0.1	0.1	0.5
3	SL#3	1.Fl	47.3	47.3	38.9	48.9	34.8	41.4	47.6	47.6	40.3	0.2	0.2	1.4
4	SL#4	GF	48.1	48.1	41.2	50.3	25.5	32.2	48.1	48.1	41.3	0.0	0.0	0.1
4	SL#4	1.Fl	48.1	48.1	41.2	50.3	26.5	33.2	48.1	48.1	41.3	0.0	0.0	0.1

Notes:

a) Ambient noise levels are based on the noise measurements taken by Yorke on June 20, 2023, at daytime and nighttime hours. In order to be conservative, evening noise levels are assumed to be the same as daytime noise levels.

b) For exposure determination purposes, CNEL at the project site is assumed to be the same as the daytime predicted noise levels since no operators are anticipated to be onsite outside of normal business hours (i.e., Penalties of 5 dB and 10 dB for evening and nighttime hours, respectively, are not applicable).

6.2.4 Operational Noise Impacts

As discussed above, both the County of Orange and the City of Irvine prohibit noise levels greater than 50 dBA at nighttime and 55 dBA during daytime hours at residential receptors. As shown in Table 6-5, total operational noise levels at the nearest sensitive receptors will not exceed the 50 dBA and 55 dBA limits at nighttime and daytime hours, respectively. As illustrated in Figure 6-1, operational noise that could exceed these limits would be confined to the project site and immediate vicinity of the landfill. Furthermore, the Federal Interagency Committee on Noise (FICON) guidance (1992) provides an established criteria to assess the impacts of substantial temporary or permanent increases in ambient noise levels. Based on the FICON criteria, if ambient noise levels are less than 60 dBA Leq, a change in a noise level of 5 dBA or greater is considered significant. The operation of the proposed equipment may raise the ambient noise level for the most impacted sensitive receptor by up to 4.2 dBA. Thus, the operation of the proposed facility is not expected to cause any significant impact during daytime, evening, or nighttime hours. Interior noise levels will be maintained at current levels at nearby receptors.

7.0 CONCLUSIONS

The noise survey performed indicated that the ambient noise levels at the nearest sensitive receptors (i.e., residences south of the project site) range between 42 and 48 dBA during daytime hours and between 38 and 41 dBA at nighttime.

There is no numerical noise standard in the County or City Municipal Codes for construction activities; however, FTA provides an 8-hour construction noise level threshold of 80 dBA Leq during the daytime at residential uses. The aggregated average construction noise will be well below the 80 dBA FTA noise level threshold at nearby receptors. Additionally, the temporary construction noise would be limited to the City's allowable construction hours , i.e., between 7:00 a.m. and 7:00 p.m. Mondays through Fridays, and 9:00 a.m. and 6:00 p.m. on Saturdays, and would permanently cease upon completion of construction. Therefore, the construction noise impact of the proposed project would be less than significant.

The main contributor to the operational noise levels is the simultaneous operation of processing equipment. The operations of the proposed equipment are not expected to substantially raise the ambient noise levels for the nearest sensitive receptors, and the interior noise levels will be maintained at current noise levels. Total operational noise levels at the nearest sensitive receptors will not exceed the 50 dBA and 55 dBA limits at nighttime and daytime hours, respectively. Moreover, the predicted CNEL at the proposed site is 80.8 dBA, which is considered "Normally Acceptable" for industrial land uses. Thus, no adverse impacts are expected from, and no special noise control measures would be required for, the operation of the proposed project. Therefore, the operational noise impact of the proposed project would be less than significant.

8.0 ANALYSIS OF NOISE SIGNIFICANCE CRITERIA

A project would normally have a significant effect on the environment related to noise if it would substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and goals of the community in which it is located. The applicable noise standards governing the unincorporated project site are the criteria in the County's General Plan Noise Element and its Noise Control Ordinance. Since the nearest sensitive receptors are in the City of Irvine, the City's Noise Ordinance and General Plan Noise Element were also reviewed.

This study predicts a less than significant impact in accordance with applicable noise ordinances and General Plans. Would the project result in:

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

No. As shown in the above analysis, temporary construction noise would be limited to the City of Irvine's allowable daytime construction hours and would permanently cease upon completion of construction. The screening-level noise analysis for project construction was completed based on methodology developed by the DOT FHWA. As shown in Table 6-3, the aggregated average RNG Plant and SoCalGas pipeline construction noise is not expected to exceed 80 dBA at nearby receptors, which is below the noise limit set by the FTA. Therefore, temporary impacts on ambient noise levels in excess of applicable standards during construction would be less than significant. Although the estimated noise levels are below the threshold, the project is proposing to install a noise monitoring instrument during the SoCalGas pipeline construction activities, as a BMP, to continuously monitor the construction noise levels to ensure that they remain below the 80 dBA threshold. Noise barriers and mufflers may also be installed as additional BMPs. It should be noted that the proposed noise control measures are project design features, i.e., BMPs, and pursuant to CEQA, are not considered mitigations.

PROJECTED IMPACT: Less than significant

The noise from the proposed RNG facility operation is not expected to substantially raise the ambient noise levels for the nearest sensitive receptors as they are approximately 0.8 miles from the project site and are shielded by the hills that are located between the residential area and the proposed facility. Interior noise levels will be maintained at current levels at nearby receptors. Additionally, total operational noise levels at the nearest sensitive receptors will not exceed the 50 dBA and 55 dBA limits at nighttime and daytime hours, respectively. Therefore, operational noise impacts would be less than significant.

PROJECTED IMPACT: Less than significant

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

No. Construction plans for the proposed RNG facility do not include intense percussive actions (e.g., hard rock-breaking, large pile-driving). A mounted impact hammer (hoe ram), which is a percussive source, may be occasionally used during the pipeline construction, when encountering rocks during trenching. The PPV at nearest receptors would be approximately 0.003 in/sec, which is well below the FTA threshold of 0.3 in/sec. Therefore, no strong groundborne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants, and impacts would be less than significant.

PROJECTED IMPACT: Less than significant

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

There is no public or private use airport within 2 miles of the project site; therefore, no impact would be expected.

PROJECTED IMPACT: No impact

9.0 REFERENCES

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APPENDIX A – NOISE MEASUREMENT FIELD NOTES

Yorke ENGINEERING, LLC
www.YorkeEngr.com

Noise Measurement Data Form

Client:	Bowerman Power LFG, LLC	Sampled by: Ernesto Betancourt II	Date: 6/20/2023
Contact/PM:	Tina Darjazanie	Notes: Sampling taken place right outside the gate of Bowerman Power generation plant, approximately 30 ft from the entrance. No vehicles passed through the entrance, occasional sounds of birds and insects during measurements	
Site:	11002 Bee Canyon Access Rd, Irvine, CA 92602		

Client No.:	1010-003-01	Calibrator Make/Model: Quest AC-300 Calibrator		Calibrator Cal Exp Date: 10/6/2023	
Sound Level Meter Make/Model:	Quest SoundPro SE/DL Type 2	Sound Level Meter Serial Number: BIU070007		Calibrator Serial Number:	AC300013570
Sample Location Name:	**Location 1**	Sample Location Description: On a hill across from the 241 freeway, at the gate of electric power generation facility, which houses 7 Cat engines and a Willexa gas treatment facility, adjacent to where the RNG site will be built			
Microphone Height (ft):	4			Weather	
Weighting: A	Calibrated?: Yes		Temperature (˚F):	Wind (MPH):	Sky:
Response Time: Slow	Calibration value: 114 dB, 1000 Hz		Day: 62 Night: 61	Day: 2 NE Night: 2 N	Day: Sunny, no clouds Night: No clouds

Barometric Pressure:	Humidity:
Day: 30.00 Night: 29.98	Day: 76% Night: 76%

Sample No.	Time On	Time Off	Range (in dBA)	Notes
#1 (Meter Sample ID S172)	8:16	8:36	60-65	Day time noise measurement: -Occasional trucks passing by from OCWR in the distance for the landfill close by, sounds of trucks dumping -Whirring noise from the FRB Landfill -8:25 a.m. sound of birds chirping overhead -8:29 a.m. multiple trucks passing by in the distance at once,
#5 (Meter Sample ID S178)	22:07	22:27	60-65	Night time noise measurement -Noticeably more buzzing and chirping coming from the insects in the surrounding foliage -No truck activity on site, only occasional sound of cars from the freeway

Yorke ENGINEERING, LLC
www.YorkeEngr.com

Noise Measurement Data Form

Client:	Bowerman Power LFG, LLC	Sampled by: Ernesto Betancourt II		Date: 6/20/2023					
Contact/PM:	Tina Darjazanie	Notes: Area is lower in elevation and blocked by houses, fencing, shrubbery, hills from the source of RNG plant. For sampling, mic is pointed towards source location							
Site:	103 Soaring Eagle, Irvine, CA 92618								
Client No.:	1010-003-01	Calibrator Make/Model: Quest AC-300 Calibrator			Calibrator Cal Exp Date: 10/6/2023				
Sound Level Meter Make/Model:	Quest SoundPro SE/DL Type 2	Sound Level Meter Serial Number: BIU070007		Calibrator Serial Number:	AC300013570				
Sample Location Name:	**Location 2**	Sample Location Description: On the street along the sidewalk between two houses, which are across the 241 freeway on the opposite side of the proposed RNG site. Location is obstructed by hills, foilage, and the freeway		Weather					
Microphone Height (ft):	4			Temperature (˚F):	Wind (MPH):	Sky:	Barometric Pressure:	Humidity:	
Weighting: A	Calibrated?: Yes			Day: 66 Night: 58	Day: 3 NE Night: 2 NW	Day: Sunny, no clouds Night: No clouds	Day: 29.99 Night: 29.97	Day: 67% Night: 82%	
Response Time: Slow	Calibration value: 114 dB, 1000 Hz								

Sample No.	Time On	Time Off	Range (in dBA)	Notes
#2 (Meter Sample ID S174)	9:17	9:37	37-49	Day time noise measurement: -Throughout measurement, there was ambient noise coming from birds chirping, whirring of cars passing by, workers in the area doing yard work for the surrounding apartments -Throughout measurement, resident at closest apartment was audibly making noise in home -9:25 a.m. louder more noticeable sounds of insects -9:27 a.m.and 9:31 a.m. loud sound occurred from resident
#6 (Meter Sample ID S181)	23:49	0:09	36-71	Night time noise measurement: -11:50 p.m.sound of car driving by -11:51 p.m.family making sound outside, being dropped off -11:57 p.m. sound of slamming car doors - 12:01-12:05 a.m., dog barking

Yorke ENGINEERING, LLC
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Noise Measurement Data Form

Client:	Bowerman Power LFG, LLC	Sampled by: Ernesto Betancourt II		Date: 6/20/2023					
Contact/PM:	Tina Darjazanie	Notes: Sample taken along the sidewalk most exposed to the source location, obstructed by houses, hills, the freeway, and shrubbery							
Site:	113 Tomato Springs, Irvine, CA 92618								
Client No.:	1010-003-01	Calibrator Make/Model: Quest AC-300 Calibrator			Calibrator Cal Exp Date: 10/6/2023				
Sound Level Meter Make/Model:	Quest SoundPro SE/DL Type 2	Sound Level Meter Serial Number: BIU070007		Calibrator Serial Number:	AC300013570				
Sample Location Name:	**Location 3**	Sample Location Description:		Weather					
Microphone Height (ft):	4	On the sidewalk of a cul-de-sac, which is across the 241 freeway on the opposite side of the proposed RNG site. Location is obstructed by hills, foliage, and the freeway		Temperature (˚F):	Wind (MPH):	Sky:	Barometric Pressure:	Humidity:	
Weighting: A	Calibrated?: Yes			Day: 70 Night: 59	Day: 5 NE Night: 2 NW	Day: Sunny, no clouds Night: No clouds	Day: 29.99 Night: 29.97	Day: 59% Night: 82%	
Response Time: Slow	Calibration value: 114 dB, 1000 Hz								

Sample No.	Time On	Time Off	Range (in dBA)	Notes
#3 (Meter Sample ID S176)	10:41	11:01	35-45	Day time noise measurement: -Lawn maintenance being done in the distance -Sounds of birds chirping in the brush -10:44 a.m. sound of garbage truck reversing -10:47 a.m. another garbage truck -10:51 a.m. birds chirping in the tree above where sound measurements being taken -10:56 and 11:01 a.m. sounds of car passing by
#7 (Meter Sample ID S180)	23:20	23:40	35-45	Night time noise measurement: -No more lawn maintenance or garbage truck activity -Sounds of frogs in the distance by the water -11:34 p.m. sound of resident's Air Conditioning system coming online

Yorke ENGINEERING, LLC
www.YorkeEngr.com

Noise Measurement Data Form

Client:	Bowerman Power LFG, LLC	Sampled by: Ernesto Betancourt II		Date: 6/20/2023					
Contact/PM:	Tina Darjazanie	Notes: Area of sampling was obstructed by freeway, fencing, hills, and housing							
Site:	21 Small Grove, Irvine, CA 92618								
Client No.:	1010-003-01	Calibrator Make/Model: Quest AC-300 Calibrator			Calibrator Cal Exp Date: 10/6/2023				
Sound Level Meter Make/Model:	Quest SoundPro SE/DL Type 2	Sound Level Meter Serial Number: BIU070007		Calibrator Serial Number:	AC300013570				
Sample Location Name:	**Location 4**	Sample Location Description: On the sidewalk of a cul-de-sac in front of a home, which is across the 241 freeway on the opposite side of the proposed RNG site. Location is obstructed by hills, foliage, and the freeway		Weather					
Microphone Height (ft):	4			Temperature (˚F):	Wind (MPH):	Sky:	Barometric Pressure:	Humidity:	
Weighting: A	Calibrated?: Yes			Day: 68 Night: 60	Day: 4 NE Night: 2 N	Day: Sunny, no clouds Night: No clouds	Day: 29.98 Night: 29.97	Day: 64% Night: 78%	
Response Time: Slow	Calibration value: 114 dB, 1000 Hz								

Sample No.	Time On	Time Off	Range (in dBA)	Notes
#4 (Meter Sample ID S175)	9:54	10:14	30-45	Day time noise measurement: -9:55 a.m. helicopter flew by overhead -9:56 a.m. sounds of birds chirping -Occasional sound spikes from cars passing by on the freeway
#8 (Meter Sample ID S179)	22:47	23:07	30-40	Night time noise measurement: -Sounds of insects and occasional vehicles passing by on the freeway -10:47 p.m. sound of car door slamming

APPENDIX B – RAW NOISE METER DATA

Sample Location 1 Daytime

S172_BIU070007_20062023_084644: Logged Data Table

Date/Time	L10-1	L90-1	Lavg-1	Lmax-1	Lmin-1	Lpk-1	Lavg-2	Lmax-2	Lmin-2	Lpk-2
6/20/2023 7:18:06	63.70	62.40	62.90	64.10	62.10	82.30	62.90	65.50	61.50	82.20
6/20/2023 7:19:06	63.60	62.50	62.90	64.50	62.00	80.60	62.90	67.40	61.20	80.70
6/20/2023 7:20:06	62.80	62.00	62.40	64.00	61.70	82.60	62.30	64.50	61.00	82.60
6/20/2023 7:21:06	63.40	62.30	62.80	64.50	61.80	80.70	62.80	66.70	61.10	80.70
6/20/2023 7:22:06	63.20	62.00	62.40	63.60	61.60	80.80	62.40	64.40	61.00	80.80
6/20/2023 7:23:06	63.30	62.10	63.30	74.60	61.70	92.90	63.00	79.00	60.90	92.90
6/20/2023 7:24:06	64.10	61.80	62.90	65.20	61.40	82.10	62.80	67.50	60.40	82.00
6/20/2023 7:25:06	63.30	62.40	62.90	63.70	61.90	82.70	62.80	64.70	61.10	82.70
6/20/2023 7:26:06	64.00	62.50	63.10	64.70	61.90	81.80	63.10	66.10	61.40	81.70
6/20/2023 7:27:06	64.20	62.90	63.60	64.80	62.30	81.40	63.50	66.00	61.60	81.30
6/20/2023 7:28:06	64.60	63.00	63.60	65.50	62.00	78.00	63.60	66.60	61.30	77.90
6/20/2023 7:29:06	65.20	62.40	63.60	65.90	62.00	83.40	63.50	67.90	61.40	83.40
6/20/2023 7:30:06	64.20	62.40	63.30	64.80	61.90	80.00	63.30	66.20	61.40	79.90
6/20/2023 7:31:06	64.00	62.40	63.10	65.70	61.90	80.50	63.10	66.90	61.00	80.50
6/20/2023 7:32:06	65.70	63.10	64.10	66.60	62.60	82.10	64.10	67.40	62.10	82.10
6/20/2023 7:33:06	63.70	62.40	62.90	64.10	62.00	78.40	62.80	64.80	61.30	78.40
6/20/2023 7:34:06	64.20	62.50	63.30	64.80	62.10	83.00	63.20	66.00	61.20	83.00
6/20/2023 7:35:06	63.80	62.50	63.10	64.70	62.10	83.10	63.00	65.20	61.30	83.10
6/20/2023 7:36:06	63.30	62.10	62.50	63.70	61.60	78.80	62.50	65.30	60.70	78.90
6/20/2023 7:37:06	62.40	61.40	61.80	62.40	61.00	75.90	61.80	63.10	60.40	75.80

S172_BIU070007_20062023_084644: Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		65.50	64.90	64.50	64.40	64.20	64.10	64.00	64.00	63.90
10%	63.90	63.80	63.80	63.70	63.70	63.60	63.60	63.60	63.50	63.50
20%	63.50	63.40	63.40	63.40	63.40	63.30	63.30	63.30	63.20	63.20
30%	63.20	63.20	63.10	63.10	63.10	63.00	63.00	63.00	63.00	63.00
40%	62.90	62.90	62.90	62.90	62.90	62.80	62.80	62.80	62.80	62.80
50%	62.70	62.70	62.70	62.70	62.70	62.70	62.60	62.60	62.60	62.60
60%	62.60	62.50	62.50	62.50	62.50	62.50	62.40	62.40	62.40	62.40
70%	62.40	62.30	62.30	62.30	62.30	62.30	62.20	62.20	62.20	62.20
80%	62.20	62.20	62.10	62.10	62.10	62.10	62.10	62.00	62.00	62.00
90%	62.00	61.90	61.90	61.90	61.80	61.80	61.70	61.60	61.50	61.40
100%	60.90									

S172_BIU070007_20062023_084644: Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
61.00	0.07	0.22	0.16	0.30	0.23	0.40	0.79	1.02	1.14	1.99	6.32
62.00	2.95	3.77	5.18	6.21	5.33	4.80	5.19	5.26	5.13	5.62	49.43
63.00	4.97	4.42	3.85	3.57	3.37	3.41	2.99	2.81	2.44	2.03	33.85
64.00	1.89	1.98	0.78	0.75	0.67	0.62	0.76	0.46	0.25	0.20	8.36
65.00	0.16	0.14	0.15	0.21	0.15	0.20	0.14	0.10	0.14	0.06	1.46
66.00	0.07	0.04	0.02	0.04	0.05	0.06	0.02	0.00	0.01	0.01	0.33
67.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
68.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
69.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
70.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
71.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
72.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
73.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
74.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.04

	Lavg-1	Lmax-1	Lmin-1
Min	61.80		61.00
Max	64.10	74.60	

Sample Location 1 Nighttime

S178_BIU070007_20062023_223018: Logged Data Table

Date/Time	L10-1	L90-1	Lavg-1	Lmax-1	Lmin-1	Lpk-1	Lavg-2	Lmax-2	Lmin-2	Lpk-2
6/20/2023 22:09:15	63.00	62.50	62.60	63.60	62.20	90.10	62.60	66.60	61.50	90.00
6/20/2023 22:10:15	62.70	62.40	62.50	62.80	62.00	78.30	62.40	63.30	61.60	78.40
6/20/2023 22:11:15	62.60	61.90	62.10	62.80	61.60	76.70	62.10	63.40	61.10	76.80
6/20/2023 22:12:15	62.50	61.90	62.20	62.70	61.60	79.40	62.10	63.40	61.00	79.40
6/20/2023 22:13:15	62.70	62.20	62.40	63.00	61.80	81.40	62.30	63.50	61.20	81.40
6/20/2023 22:14:15	62.90	62.30	62.50	63.10	62.00	76.80	62.40	63.50	61.10	76.80
6/20/2023 22:15:15	63.30	62.70	62.90	63.40	62.30	81.20	62.90	64.00	61.80	81.10
6/20/2023 22:16:15	63.50	62.70	63.00	63.80	62.30	78.20	62.90	64.40	61.80	78.00
6/20/2023 22:17:15	63.90	62.70	63.20	64.20	62.30	78.20	63.10	64.90	61.80	78.20
6/20/2023 22:18:15	63.00	62.30	62.60	63.20	62.10	79.60	62.50	63.80	61.50	79.60
6/20/2023 22:19:15	62.90	62.30	62.50	63.00	61.80	76.40	62.50	63.50	61.40	76.50
6/20/2023 22:20:15	63.10	62.50	62.70	63.10	61.90	76.90	62.70	63.70	61.40	76.90
6/20/2023 22:21:15	63.30	62.60	62.80	63.60	62.20	76.70	62.80	64.00	61.70	76.70
6/20/2023 22:22:15	63.40	62.60	62.90	63.80	62.30	76.50	62.80	64.40	61.80	76.30
6/20/2023 22:23:15	63.40	62.80	63.00	63.40	62.40	81.70	63.00	64.10	61.90	81.70
6/20/2023 22:24:15	64.40	63.00	63.60	64.90	62.70	82.40	63.60	65.80	62.30	82.30
6/20/2023 22:25:15	63.60	62.90	63.10	63.90	62.60	76.10	63.00	64.40	62.00	76.20
6/20/2023 22:26:15	64.10	62.70	63.30	64.30	62.40	77.40	63.20	65.30	61.80	77.40
6/20/2023 22:27:15	63.40	62.60	63.00	63.70	62.20	77.50	62.90	64.40	61.70	77.50
6/20/2023 22:28:15	63.50	62.80	63.00	63.70	62.40	77.70	63.00	64.30	61.90	77.60

S178_BIU070007_20062023_223018: Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		64.10	63.90	63.80	63.60	63.50	63.40	63.40	63.30	63.30
10%	63.20	63.20	63.20	63.10	63.10	63.10	63.10	63.10	63.00	63.00
20%	63.00	63.00	63.00	62.90	62.90	62.90	62.90	62.90	62.90	62.90
30%	62.90	62.80	62.80	62.80	62.80	62.80	62.80	62.80	62.80	62.70
40%	62.70	62.70	62.70	62.70	62.70	62.70	62.70	62.70	62.60	62.60
50%	62.60	62.60	62.60	62.60	62.60	62.60	62.60	62.50	62.50	62.50
60%	62.50	62.50	62.50	62.50	62.50	62.40	62.40	62.40	62.40	62.40
70%	62.40	62.40	62.40	62.40	62.40	62.30	62.30	62.30	62.30	62.30
80%	62.30	62.30	62.30	62.20	62.20	62.20	62.20	62.20	62.20	62.10
90%	62.10	62.10	62.10	62.10	62.00	62.00	61.90	61.90	61.80	61.70
100%	61.50									

S178_BIU070007_20062023_223018: Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
61.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.42	0.78	1.32	2.55
62.00	1.72	2.72	4.67	5.61	8.53	9.38	8.41	8.52	9.18	8.40	67.14
63.00	7.45	5.59	4.50	3.28	2.33	1.52	0.95	1.02	0.65	0.74	28.02
64.00	0.65	0.61	0.34	0.28	0.11	0.14	0.06	0.02	0.05	0.03	2.29

	Lavg-1	Lmax-1	Lmin-1
Min	62.10		61.60
Max	63.60	64.90	

Sample Location 2 Daytime

S174_BIU070007_20062023_093914: Logged Data Table

Date/Time	L10-1	L90-1	Lavg-1	Lmax-1	Lmin-1	Lpk-1	Lavg-2	Lmax-2	Lmin-2	Lpk-2
6/20/2023 9:18:59	46.30	40.10	43.30	55.20	39.20	73.90	42.80	61.50	38.40	74.00
6/20/2023 9:19:59	42.00	40.10	41.00	44.10	38.70	78.60	40.90	51.80	37.30	78.60
6/20/2023 9:20:59	43.50	38.60	41.40	48.30	37.40	84.50	41.00	56.70	36.80	84.50
6/20/2023 9:21:59	47.00	39.60	43.30	49.50	37.40	82.40	42.80	54.30	36.70	82.40
6/20/2023 9:22:59	43.80	38.30	40.90	51.20	37.70	77.80	40.40	56.90	37.20	77.80
6/20/2023 9:23:59	46.10	39.70	43.20	49.70	38.90	72.00	42.90	54.40	38.10	72.20
6/20/2023 9:24:59	42.90	38.20	40.60	52.40	37.30	73.60	40.10	59.70	36.60	73.60
6/20/2023 9:25:59	48.30	40.20	45.40	54.00	39.70	73.50	45.10	57.90	37.50	73.20
6/20/2023 9:26:59	42.50	39.20	40.50	47.20	38.30	79.80	40.30	55.20	37.40	79.80
6/20/2023 9:27:59	47.10	38.90	42.60	53.10	38.40	75.40	41.90	60.30	37.20	75.40
6/20/2023 9:28:59	44.90	39.00	41.70	51.70	38.00	77.60	41.00	58.90	36.70	77.70
6/20/2023 9:29:59	42.50	38.30	40.00	46.00	37.40	70.90	39.80	50.20	36.60	71.00
6/20/2023 9:30:59	44.40	38.80	41.20	51.30	38.00	71.00	40.60	57.50	36.90	70.80
6/20/2023 9:31:59	45.20	38.80	41.70	50.00	37.70	70.30	41.20	55.70	36.70	70.30
6/20/2023 9:32:59	48.30	39.20	44.30	59.80	38.20	83.50	43.20	66.90	36.70	83.50
6/20/2023 9:33:59	47.90	39.20	43.70	55.50	38.10	76.60	42.40	63.60	36.70	76.60
6/20/2023 9:34:59	40.30	38.00	39.00	41.90	37.40	65.60	38.80	48.20	36.10	65.80
6/20/2023 9:35:59	44.90	38.90	41.30	51.10	37.90	74.50	40.90	58.10	36.30	74.30
6/20/2023 9:36:59	39.80	38.10	38.90	40.60	37.40	62.00	38.80	43.20	36.70	61.70
6/20/2023 9:37:59	42.60	37.70	39.80	49.20	37.20	76.30	39.40	55.80	36.50	76.40

S174_BIU070007_20062023_093914: Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		50.70	49.10	48.20	47.50	47.10	46.80	46.30	46.00	45.70
10%	45.40	45.10	44.90	44.60	44.20	43.90	43.60	43.30	43.10	42.90
20%	42.70	42.60	42.50	42.40	42.30	42.10	42.00	41.90	41.80	41.70
30%	41.60	41.50	41.40	41.30	41.20	41.10	41.00	41.00	40.90	40.80
40%	40.70	40.70	40.60	40.50	40.50	40.40	40.30	40.30	40.20	40.20
50%	40.10	40.10	40.00	39.90	39.90	39.90	39.80	39.80	39.80	39.70
60%	39.70	39.70	39.60	39.60	39.50	39.50	39.50	39.40	39.40	39.30
70%	39.30	39.30	39.20	39.20	39.20	39.10	39.10	39.00	39.00	38.90
80%	38.90	38.90	38.80	38.80	38.70	38.70	38.60	38.60	38.50	38.40
90%	38.40	38.30	38.20	38.10	38.10	38.00	37.90	37.80	37.70	37.50
100%	37.10									

S174_BIU070007_20062023_093914: Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
37.00	0.00	0.00	0.07	0.10	0.23	0.40	0.55	0.64	0.82	0.83	3.64
38.00	1.14	1.15	1.32	1.19	1.24	1.35	1.65	1.82	2.06	2.18	15.10
39.00	2.29	2.35	2.45	2.64	2.66	2.60	2.58	2.61	2.85	2.82	25.84
40.00	2.81	1.42	1.95	1.79	1.67	1.63	1.45	1.37	1.41	1.29	16.77
41.00	1.36	1.34	1.43	1.11	1.04	0.93	1.00	0.95	1.01	0.96	11.12
42.00	0.93	0.86	0.87	0.76	0.92	0.91	0.90	0.83	0.71	0.66	8.34
43.00	0.67	0.24	0.55	0.44	0.41	0.37	0.40	0.38	0.32	0.34	4.13
44.00	0.29	0.29	0.30	0.28	0.29	0.27	0.27	0.31	0.33	0.38	3.02
45.00	0.42	0.38	0.33	0.32	0.35	0.33	0.36	0.35	0.38	0.32	3.53
46.00	0.46	0.29	0.31	0.25	0.28	0.24	0.23	0.21	0.22	0.25	2.73
47.00	0.29	0.26	0.31	0.27	0.18	0.22	0.24	0.20	0.16	0.14	2.27
48.00	0.16	0.14	0.15	0.13	0.10	0.13	0.11	0.10	0.11	0.11	1.25
49.00	0.12	0.08	0.10	0.08	0.08	0.10	0.08	0.07	0.07	0.07	0.84
50.00	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.05	0.04	0.47
51.00	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.33
52.00	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.23
53.00	0.02	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.14
54.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
55.00	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.05
56.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
57.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.04
58.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
59.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04

	Lavg-1	Lmax-1	Lmin-1
Min	38.90		37.20
Max	45.40	59.80	

Sample Location 2 Nighttime

S181_BIU070007_21062023_001027: Logged Data Table

Date/Time	L10-1	L90-1	Lavg-1	Lmax-1	Lmin-1	Lpk-1	Lavg-2	Lmax-2	Lmin-2	Lpk-2
6/20/2023 23:51:00	42.30	36.10	41.00	59.60	35.40	81.30	39.30	65.80	34.80	81.30
6/20/2023 23:52:00	40.30	36.30	38.20	42.10	35.50	62.40	38.20	43.70	35.00	62.50
6/20/2023 23:53:00	38.00	35.70	36.70	39.60	35.40	65.50	36.50	43.00	34.90	65.10
6/20/2023 23:54:00	40.30	35.50	37.30	43.20	35.10	75.30	37.10	48.90	34.70	75.30
6/20/2023 23:55:00	37.10	35.60	36.30	39.00	35.20	63.90	36.20	42.30	34.60	64.20
6/20/2023 23:56:00	37.10	35.50	36.50	46.50	35.20	82.70	36.20	54.80	34.80	82.70
6/20/2023 23:57:00	38.10	35.30	36.20	40.40	35.10	63.70	36.10	41.90	34.60	63.80
6/20/2023 23:58:00	38.90	35.20	36.80	46.10	34.90	71.00	36.50	52.60	34.60	70.90
6/20/2023 23:59:00	38.00	35.30	36.30	42.80	35.00	61.50	36.20	48.70	34.70	61.10
6/21/2023 0:00:00	37.00	35.40	35.80	38.60	35.10	53.70	35.70	38.50	34.70	54.60
6/21/2023 0:01:00	37.00	35.90	36.20	38.40	35.40	52.90	36.10	39.10	34.90	51.70
6/21/2023 0:02:00	38.70	35.60	36.80	39.70	35.40	52.70	36.80	40.40	35.00	52.60
6/21/2023 0:03:00	44.80	36.90	40.60	50.50	36.20	76.20	40.50	53.70	35.70	76.10
6/21/2023 0:04:00	78.90	42.40	72.80	82.60	37.00	100.80	70.30	87.20	35.40	100.70
6/21/2023 0:05:00	70.70	38.60	64.30	78.10	36.60	97.40	61.30	84.30	34.90	97.40
6/21/2023 0:06:00	47.60	35.60	41.60	55.00	35.00	86.60	40.00	62.80	34.70	86.60
6/21/2023 0:07:00	44.70	37.10	40.40	47.20	35.50	68.80	40.30	48.40	35.40	68.70
6/21/2023 0:08:00	41.40	35.50	38.60	42.80	35.20	57.50	38.40	43.60	34.70	57.70
6/21/2023 0:09:00	37.90	35.40	36.50	38.90	35.10	65.10	36.40	40.70	34.70	64.40
6/21/2023 0:10:00	39.80	36.10	38.00	40.00	35.60	60.20	37.80	40.90	35.10	59.90

S181_BIU070007_21062023_001027: Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		76.50	73.50	71.10	69.00	66.30	62.20	57.00	50.60	47.20
10%	45.40	43.90	42.60	41.90	41.30	40.80	40.30	40.00	39.80	39.60
20%	39.50	39.30	39.20	39.10	39.00	38.80	38.70	38.60	38.50	38.30
30%	38.20	38.10	38.00	37.90	37.80	37.70	37.60	37.50	37.40	37.30
40%	37.20	37.10	37.10	37.00	36.90	36.90	36.80	36.80	36.70	36.60
50%	36.60	36.50	36.50	36.40	36.40	36.30	36.30	36.20	36.20	36.20
60%	36.10	36.10	36.10	36.00	36.00	36.00	35.90	35.90	35.90	35.90
70%	35.80	35.80	35.80	35.70	35.70	35.70	35.60	35.60	35.60	35.60
80%	35.50	35.50	35.50	35.50	35.40	35.40	35.40	35.40	35.40	35.30
90%	35.30	35.30	35.20	35.20	35.20	35.20	35.10	35.10	35.10	35.00
100%	34.80									

S181_BIU070007_21062023_001027: Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
34.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
35.00	0.26	0.90	2.95	4.07	3.43	4.68	4.23	4.13	2.92	3.26	30.83
36.00	3.38	3.16	2.96	2.65	2.31	2.01	1.68	2.15	1.75	1.97	24.01
37.00	1.92	1.13	1.37	1.16	1.17	1.08	1.10	1.10	0.98	0.99	12.01
38.00	0.86	0.88	0.96	0.82	0.77	0.59	0.75	0.86	0.94	0.69	8.11
39.00	0.82	0.67	0.76	0.91	0.88	0.80	0.70	0.61	0.59	0.63	7.37
40.00	0.55	0.24	0.35	0.28	0.32	0.24	0.24	0.21	0.18	0.17	2.77
41.00	0.18	0.17	0.20	0.17	0.17	0.14	0.13	0.15	0.18	0.18	1.68
42.00	0.20	0.17	0.13	0.11	0.12	0.13	0.17	0.15	0.12	0.10	1.41
43.00	0.08	0.03	0.07	0.08	0.06	0.06	0.07	0.09	0.10	0.07	0.73
44.00	0.06	0.07	0.07	0.05	0.10	0.10	0.09	0.06	0.05	0.05	0.70
45.00	0.06	0.06	0.08	0.07	0.05	0.05	0.05	0.05	0.05	0.06	0.58
46.00	0.11	0.09	0.04	0.05	0.05	0.05	0.04	0.05	0.04	0.05	0.56
47.00	0.06	0.08	0.05	0.03	0.05	0.04	0.03	0.03	0.03	0.03	0.40
48.00	0.03	0.03	0.04	0.04	0.03	0.04	0.04	0.04	0.03	0.04	0.36
49.00	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.22
50.00	0.02	0.04	0.05	0.03	0.02	0.02	0.01	0.02	0.02	0.02	0.26
51.00	0.02	0.04	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.21
52.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.13
53.00	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.14
54.00	0.01	0.02	0.02	0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.16
55.00	0.02	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.15
56.00	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.14
57.00	0.02	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.18
58.00	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.17
59.00	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.20
60.00	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.17
61.00	0.02	0.03	0.01	0.02	0.02	0.03	0.02	0.03	0.02	0.03	0.23
62.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.20
63.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.21
64.00	0.03	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.25
65.00	0.02	0.02	0.02	0.03	0.02	0.04	0.02	0.03	0.02	0.04	0.27
66.00	0.03	0.04	0.03	0.04	0.04	0.04	0.03	0.04	0.04	0.04	0.35
67.00	0.04	0.05	0.02	0.05	0.04	0.04	0.04	0.03	0.03	0.03	0.36
68.00	0.03	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.34
69.00	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.05	0.06	0.49
70.00	0.06	0.05	0.04	0.05	0.06	0.05	0.05	0.04	0.04	0.04	0.49
71.00	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.41
72.00	0.04	0.05	0.04	0.04	0.04	0.04	0.05	0.05	0.04	0.05	0.42
73.00	0.06	0.05	0.03	0.04	0.04	0.05	0.05	0.05	0.04	0.03	0.45
74.00	0.04	0.03	0.04	0.04	0.03	0.04	0.04	0.05	0.03	0.04	0.38
75.00	0.03	0.03	0.03	0.04	0.02	0.04	0.03	0.03	0.02	0.03	0.28
76.00	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.03	0.03	0.26
77.00	0.03	0.03	0.03	0.02	0.02	0.02	0.03	0.02	0.03	0.02	0.25
78.00	0.01	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.18
79.00	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.01	0.01	0.01	0.21
80.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
81.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.11
82.00	0.02	0.02	0.00	0.00	0.01	0.01	0.02	0.00	0.00	0.00	0.08

	Lavg-1	Lmax-1	Lmin-1
Min	35.80		34.90
Max	41.60	59.60	

Notes:
Dog barking between 12:01 am and 12:05 am.

The sound levels for this time period of measurement (highlighted in orange) have been excluded from the analysis due to dog barking in close proximity of the meter.

Sample Location 3 Daytime

S176_BIU070007_20062023_110323: Logged Data Table

Date/Time	L10-1	L90-1	Lavg-1	Lmax-1	Lmin-1	Lpk-1	Lavg-2	Lmax-2	Lmin-2	Lpk-2
6/20/2023 10:43:22	46.20	43.40	44.60	47.50	42.20	62.80	44.50	49.60	41.20	63.40
6/20/2023 10:44:22	47.10	43.90	45.60	53.10	42.70	84.80	45.40	59.40	42.00	84.80
6/20/2023 10:45:22	47.90	44.00	46.10	49.10	43.50	73.60	45.90	52.30	42.70	73.70
6/20/2023 10:46:22	47.40	44.20	45.90	48.90	43.80	75.40	45.80	52.10	43.00	75.40
6/20/2023 10:47:22	48.20	45.10	46.80	53.00	44.20	74.00	46.70	57.20	42.80	74.00
6/20/2023 10:48:22	57.40	46.50	52.80	65.30	45.60	79.50	52.40	66.50	44.30	79.50
6/20/2023 10:49:22	51.70	46.40	48.80	54.90	45.70	74.80	48.40	58.80	45.10	74.80
6/20/2023 10:50:22	49.30	45.60	47.30	51.40	44.90	81.10	47.20	56.60	43.90	81.10
6/20/2023 10:51:22	47.80	45.20	46.40	48.70	44.40	73.70	46.30	50.40	43.50	73.70
6/20/2023 10:52:22	49.20	45.80	47.20	55.00	44.90	74.20	47.10	59.50	43.50	74.00
6/20/2023 10:53:22	50.30	46.80	48.50	52.40	46.20	71.60	48.40	56.60	44.90	71.60
6/20/2023 10:54:22	49.10	46.80	47.90	50.90	45.70	70.40	47.60	56.30	44.50	70.40
6/20/2023 10:55:22	48.60	44.90	46.80	51.70	44.20	72.00	46.60	55.90	42.60	71.70
6/20/2023 10:56:22	46.30	43.90	44.90	48.50	43.20	74.30	44.80	51.30	42.20	74.40
6/20/2023 10:57:22	50.20	44.80	47.10	56.30	43.90	74.70	47.00	59.00	43.00	74.70
6/20/2023 10:58:22	49.40	44.30	47.10	54.70	43.80	77.20	47.00	55.70	42.90	77.20
6/20/2023 10:59:22	47.40	45.00	46.10	49.00	44.10	67.80	46.00	52.50	43.20	67.80
6/20/2023 11:00:22	47.50	45.50	46.40	47.80	44.60	70.90	46.30	50.40	43.60	71.10
6/20/2023 11:01:22	46.70	45.40	46.10	47.30	44.80	65.50	46.00	48.70	44.20	65.60
6/20/2023 11:02:22	47.70	44.20	45.70	49.60	43.20	70.70	45.70	50.20	42.50	70.70

S176_BIU070007_20062023_110323: Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		54.50	52.70	51.70	51.00	50.50	50.00	49.60	49.30	49.10
10%	48.90	48.70	48.60	48.50	48.30	48.20	48.10	48.00	47.90	47.80
20%	47.70	47.70	47.60	47.50	47.40	47.40	47.30	47.20	47.20	47.10
30%	47.10	47.00	47.00	46.90	46.90	46.80	46.80	46.70	46.70	46.60
40%	46.60	46.50	46.50	46.50	46.40	46.40	46.30	46.30	46.20	46.20
50%	46.20	46.10	46.10	46.00	46.00	45.90	45.90	45.90	45.80	45.80
60%	45.80	45.70	45.70	45.70	45.60	45.60	45.60	45.50	45.50	45.50
70%	45.40	45.40	45.30	45.30	45.30	45.20	45.20	45.10	45.10	45.00
80%	45.00	44.90	44.80	44.80	44.70	44.60	44.60	44.50	44.40	44.30
90%	44.20	44.10	44.10	44.00	43.90	43.90	43.80	43.70	43.60	43.30
100%	42.10									

S176_BIU070007_20062023_110323: Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
42.00	0.00	0.00	0.00	0.02	0.01	0.03	0.03	0.05	0.07	0.03	0.24
43.00	0.05	0.05	0.22	0.25	0.31	0.34	0.51	0.62	0.75	1.20	4.30
44.00	1.47	1.41	1.61	1.21	1.23	0.94	1.19	1.69	1.61	1.29	13.64
45.00	1.48	1.73	2.12	2.34	2.35	2.61	2.55	2.69	3.02	3.04	23.92
46.00	3.10	2.07	2.51	2.30	2.40	2.32	2.28	2.13	2.19	2.21	23.49
47.00	1.96	1.81	1.90	1.77	1.55	1.56	1.43	1.36	1.25	1.13	15.73
48.00	1.18	0.97	0.88	0.91	0.85	0.86	0.77	0.76	0.77	0.68	8.63
49.00	0.63	0.35	0.43	0.45	0.37	0.42	0.33	0.27	0.25	0.22	3.72
50.00	0.22	0.22	0.23	0.20	0.23	0.23	0.20	0.18	0.18	0.20	2.07
51.00	0.14	0.14	0.12	0.11	0.13	0.13	0.16	0.16	0.18	0.18	1.45
52.00	0.14	0.09	0.09	0.10	0.06	0.07	0.11	0.10	0.10	0.08	0.93
53.00	0.06	0.05	0.06	0.05	0.05	0.05	0.04	0.06	0.05	0.05	0.53
54.00	0.05	0.05	0.06	0.06	0.05	0.04	0.05	0.06	0.04	0.03	0.49
55.00	0.02	0.02	0.03	0.03	0.01	0.01	0.01	0.01	0.01	0.02	0.19
56.00	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.13
57.00	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.11
58.00	0.02	0.02	0.02	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.12
59.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
60.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
61.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
62.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03
63.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.06
64.00	0.01	0.01	0.00	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.11
65.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03

	Lavg-1	Lmax-1	Lmin-1
Min	44.60		42.20
Max	52.80	65.30	

Sample Location 3 Nighttime

S180_BIU070007_20062023_234148: Logged Data Table

Date/Time	L10-1	L90-1	Lavg-1	Lmax-1	Lmin-1	Lpk-1	Lavg-2	Lmax-2	Lmin-2	Lpk-2
6/20/2023 23:21:59	44.40	37.80	40.90	46.20	37.40	67.40	40.90	49.70	36.80	67.30
6/20/2023 23:22:59	43.70	38.20	40.50	45.00	37.40	75.30	40.30	50.80	35.70	75.50
6/20/2023 23:23:59	41.10	37.90	39.30	42.40	37.30	64.60	39.10	44.10	36.50	64.00
6/20/2023 23:24:59	40.40	36.10	38.20	42.20	35.80	64.80	38.10	44.60	35.20	64.40
6/20/2023 23:25:59	39.40	36.40	37.70	41.30	35.70	68.40	37.60	43.10	35.40	68.20
6/20/2023 23:26:59	41.20	35.60	38.60	42.00	35.30	55.30	38.60	43.60	34.90	56.20
6/20/2023 23:27:59	38.60	35.60	36.90	39.20	35.20	56.20	36.90	40.10	34.80	56.80
6/20/2023 23:28:59	43.50	36.00	39.90	45.70	35.50	61.80	39.90	47.50	35.00	61.90
6/20/2023 23:29:59	40.30	35.70	37.60	41.20	35.20	62.70	37.50	42.30	34.80	62.60
6/20/2023 23:30:59	41.70	36.80	39.80	42.20	36.20	59.20	39.60	43.00	35.70	59.80
6/20/2023 23:31:59	39.20	35.70	37.30	40.10	35.00	66.50	37.20	42.50	34.70	66.30
6/20/2023 23:32:59	37.30	35.20	36.10	40.50	34.80	56.90	36.00	43.60	34.50	56.50
6/20/2023 23:33:59	38.30	35.60	36.90	40.10	35.40	56.50	36.80	41.50	34.90	56.60
6/20/2023 23:34:59	39.70	35.30	37.00	40.00	35.10	66.10	37.00	42.50	34.60	65.60
6/20/2023 23:35:59	41.30	39.30	40.20	45.30	38.80	77.80	40.00	53.00	37.90	77.70
6/20/2023 23:36:59	40.50	37.20	38.90	41.00	36.80	64.90	38.80	44.30	36.40	64.90
6/20/2023 23:37:59	39.50	36.90	37.90	40.50	36.60	69.80	37.90	46.80	36.30	69.80
6/20/2023 23:38:59	39.70	37.00	38.20	40.90	36.80	65.60	38.10	44.40	36.50	65.70
6/20/2023 23:39:59	39.90	37.80	38.70	40.40	37.20	60.50	38.60	41.40	36.60	60.50
6/20/2023 23:40:59	43.60	39.10	41.80	50.70	38.10	81.90	41.50	59.10	37.50	81.80

S180_BIU070007_20062023_234148: Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		44.50	43.60	43.10	42.70	42.20	41.90	41.70	41.50	41.30
10%	41.10	40.90	40.70	40.60	40.50	40.40	40.30	40.20	40.10	40.00
20%	39.90	39.80	39.80	39.70	39.70	39.60	39.60	39.50	39.50	39.40
30%	39.30	39.20	39.20	39.10	39.00	39.00	38.90	38.80	38.80	38.70
40%	38.70	38.60	38.60	38.50	38.50	38.40	38.40	38.30	38.20	38.20
50%	38.10	38.00	38.00	37.90	37.90	37.80	37.80	37.70	37.70	37.60
60%	37.60	37.50	37.50	37.40	37.40	37.30	37.30	37.20	37.20	37.10
70%	37.00	36.90	36.90	36.80	36.80	36.70	36.70	36.60	36.60	36.50
80%	36.40	36.30	36.30	36.20	36.10	36.00	36.00	35.90	35.80	35.80
90%	35.70	35.60	35.50	35.50	35.40	35.40	35.30	35.30	35.20	35.10
100%	34.70									

S180_BIU070007_20062023_234148: Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
34.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.12
35.00	0.11	0.56	1.13	1.00	1.49	2.08	1.72	1.31	1.42	1.55	12.38
36.00	1.41	1.59	1.18	1.29	1.21	1.37	1.31	1.81	1.66	2.08	14.91
37.00	1.86	1.18	1.43	1.41	1.73	2.06	2.08	2.03	2.05	2.20	18.03
38.00	2.16	1.81	1.47	1.45	1.64	1.74	2.10	2.13	1.93	1.58	18.01
39.00	1.49	1.41	1.32	1.41	1.31	1.44	1.74	2.30	1.75	1.56	15.74
40.00	1.69	0.79	1.07	1.00	1.16	0.85	0.87	0.96	0.65	0.64	9.67
41.00	0.57	0.38	0.39	0.45	0.61	0.51	0.64	0.57	0.53	0.50	5.13
42.00	0.33	0.29	0.36	0.27	0.20	0.17	0.13	0.19	0.23	0.21	2.37
43.00	0.29	0.13	0.32	0.21	0.21	0.22	0.21	0.15	0.17	0.12	2.04
44.00	0.08	0.10	0.10	0.06	0.10	0.15	0.08	0.07	0.08	0.09	0.92
45.00	0.05	0.03	0.04	0.06	0.09	0.10	0.04	0.03	0.03	0.02	0.50
46.00	0.02	0.01	0.03	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.09
47.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
48.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
49.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02

	Lavg-1	Lmax-1	Lmin-1
Min	36.10		34.80
Max	41.80	50.70	

Sample Location 4 Daytime

S175_BIU070007_20062023_101511: Logged Data Table

Date/Time	L10-1	L90-1	Lavg-1	Lmax-1	Lmin-1	Lpk-1	Lavg-2	Lmax-2	Lmin-2	Lpk-2
6/20/2023 9:55:33	61.80	47.80	57.20	62.70	44.70	82.80	56.80	63.60	42.10	82.70
6/20/2023 9:56:33	55.90	43.10	50.30	57.00	41.60	82.00	49.90	58.70	40.00	81.90
6/20/2023 9:57:33	55.10	42.70	48.80	59.70	41.00	79.90	47.80	64.40	39.80	79.90
6/20/2023 9:58:33	44.20	41.30	42.90	49.00	40.30	73.90	42.70	55.70	39.60	73.90
6/20/2023 9:59:33	47.10	43.00	45.20	49.20	41.80	79.50	45.10	53.00	40.10	79.50
6/20/2023 10:00:33	46.70	41.90	44.20	48.50	41.10	73.10	43.90	51.00	39.40	73.10
6/20/2023 10:01:33	44.40	40.00	42.00	46.20	39.50	62.30	41.80	48.80	38.20	62.30
6/20/2023 10:02:33	46.80	42.00	44.40	48.60	39.50	73.30	44.30	50.80	38.30	73.30
6/20/2023 10:03:33	44.40	40.00	42.60	47.10	39.30	74.40	42.50	49.50	38.70	74.40
6/20/2023 10:04:33	52.10	42.20	46.60	54.60	40.30	73.40	46.50	55.90	39.30	73.10
6/20/2023 10:05:33	46.30	42.80	44.60	50.50	42.20	72.60	44.50	57.20	40.60	72.60
6/20/2023 10:06:33	49.20	44.30	46.30	53.10	43.50	67.80	46.20	55.90	41.60	67.70
6/20/2023 10:07:33	44.10	41.60	42.80	46.30	41.10	75.60	42.70	52.80	40.30	75.70
6/20/2023 10:08:33	49.10	42.30	46.10	52.50	41.00	72.20	45.80	59.30	40.40	72.10
6/20/2023 10:09:33	50.10	40.80	46.80	53.40	39.30	70.30	46.20	58.30	38.10	70.20
6/20/2023 10:10:33	51.40	41.60	47.80	53.10	40.50	72.80	47.40	57.80	39.50	72.70
6/20/2023 10:11:33	51.50	42.10	47.90	57.50	41.50	74.10	47.40	61.50	40.00	74.00
6/20/2023 10:12:33	48.80	42.40	45.90	52.40	41.20	72.70	45.70	55.60	40.00	72.80
6/20/2023 10:13:33	44.90	40.60	42.80	47.20	39.60	65.90	42.60	53.10	38.40	66.10
6/20/2023 10:14:33	46.60	41.50	44.10	49.90	40.60	81.70	43.80	55.80	39.00	81.70

S175_BIU070007_20062023_101511: Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		59.90	58.10	56.60	55.60	54.50	53.00	52.30	51.80	51.10
10%	50.60	50.10	49.70	49.30	49.00	48.70	48.50	48.20	47.90	47.70
20%	47.50	47.20	47.00	46.90	46.70	46.60	46.40	46.30	46.20	46.10
30%	46.00	45.90	45.80	45.70	45.60	45.50	45.50	45.40	45.30	45.20
40%	45.10	45.00	44.90	44.90	44.80	44.70	44.60	44.50	44.50	44.40
50%	44.30	44.20	44.20	44.10	44.00	44.00	43.90	43.80	43.80	43.70
60%	43.60	43.60	43.50	43.40	43.40	43.30	43.20	43.10	43.10	42.90
70%	42.90	42.80	42.70	42.70	42.60	42.50	42.50	42.40	42.40	42.30
80%	42.20	42.10	42.00	42.00	41.90	41.80	41.80	41.70	41.60	41.50
90%	41.40	41.30	41.20	41.10	40.90	40.70	40.50	40.20	39.90	39.70
100%	39.20									

S175_BIU070007_20062023_101511: Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
39.00	0.00	0.00	0.00	0.07	0.09	0.15	0.25	0.39	0.37	0.41	1.73
40.00	0.45	0.24	0.27	0.37	0.38	0.45	0.44	0.39	0.52	0.38	3.89
41.00	0.48	0.67	0.71	0.88	0.92	1.06	1.10	1.09	1.36	1.59	9.85
42.00	1.34	1.19	1.11	1.54	1.20	1.54	1.88	1.64	1.37	1.48	14.28
43.00	1.65	0.57	1.25	1.23	1.45	1.43	1.65	1.51	1.30	1.53	13.57
44.00	1.52	1.45	1.46	1.51	1.30	1.26	1.23	1.27	1.24	1.17	13.42
45.00	1.28	1.26	1.18	1.19	1.15	1.09	1.13	1.19	1.17	1.13	11.78
46.00	1.03	0.71	1.01	1.01	0.85	0.92	0.78	0.73	0.66	0.71	8.40
47.00	0.58	0.51	0.48	0.51	0.44	0.39	0.49	0.44	0.46	0.41	4.71
48.00	0.40	0.37	0.40	0.37	0.32	0.36	0.40	0.43	0.36	0.33	3.74
49.00	0.37	0.30	0.32	0.33	0.33	0.32	0.29	0.30	0.26	0.23	3.05
50.00	0.20	0.23	0.20	0.22	0.19	0.20	0.22	0.20	0.21	0.20	2.08
51.00	0.18	0.18	0.16	0.15	0.18	0.18	0.14	0.13	0.17	0.13	1.60
52.00	0.20	0.15	0.15	0.25	0.25	0.18	0.10	0.12	0.12	0.14	1.67
53.00	0.13	0.09	0.06	0.08	0.07	0.07	0.08	0.07	0.08	0.09	0.82
54.00	0.06	0.09	0.05	0.05	0.06	0.06	0.08	0.07	0.08	0.09	0.71
55.00	0.11	0.11	0.07	0.08	0.06	0.09	0.11	0.11	0.08	0.08	0.90
56.00	0.08	0.07	0.11	0.08	0.11	0.10	0.16	0.19	0.05	0.08	1.03
57.00	0.07	0.05	0.06	0.06	0.10	0.05	0.05	0.05	0.03	0.03	0.57
58.00	0.03	0.10	0.08	0.11	0.06	0.08	0.11	0.07	0.07	0.08	0.79
59.00	0.06	0.04	0.03	0.04	0.03	0.03	0.04	0.04	0.03	0.04	0.38
60.00	0.05	0.03	0.01	0.01	0.01	0.01	0.02	0.02	0.07	0.07	0.31
61.00	0.04	0.05	0.03	0.01	0.01	0.01	0.01	0.06	0.04	0.03	0.30
62.00	0.03	0.04	0.03	0.03	0.09	0.08	0.07	0.04	0.00	0.00	0.41

	Lavg-1	Lmax-1	Lmin-1
Min	42.00		39.30
Max	57.20	62.70	

Sample Location 4 Nighttime

S179_BIU070007_20062023_230957: Logged Data Table

Date/Time	L10-1	L90-1	Lavg-1	Lmax-1	Lmin-1	Lpk-1	Lavg-2	Lmax-2	Lmin-2	Lpk-2
6/20/2023 22:49:44	45.10	40.60	43.30	54.70	39.70	77.50	42.80	61.20	38.20	77.50
6/20/2023 22:50:44	42.50	36.90	39.70	44.30	36.20	71.10	39.50	51.50	35.50	71.30
6/20/2023 22:51:44	41.70	38.20	39.70	44.20	37.60	75.00	39.60	49.30	36.80	74.90
6/20/2023 22:52:44	44.60	39.70	42.30	47.70	38.80	85.00	42.10	55.80	37.90	85.00
6/20/2023 22:53:44	44.00	37.80	41.00	48.20	37.20	84.40	40.80	56.80	36.70	84.40
6/20/2023 22:54:44	42.60	38.50	40.80	45.70	37.70	72.50	40.70	48.60	36.90	72.40
6/20/2023 22:55:44	42.90	39.00	40.80	46.40	37.30	78.20	40.70	53.20	36.40	78.10
6/20/2023 22:56:44	43.70	39.20	41.60	44.60	37.80	69.00	41.30	46.90	36.50	69.40
6/20/2023 22:57:44	41.80	37.10	38.90	47.00	36.70	75.50	38.60	55.20	36.10	75.50
6/20/2023 22:58:44	47.00	38.40	43.20	52.50	36.70	73.10	43.00	54.80	36.20	73.00
6/20/2023 22:59:44	44.10	38.90	41.70	44.80	38.10	58.80	41.70	45.90	37.40	58.20
6/20/2023 23:00:44	44.60	37.60	41.60	45.40	37.00	70.10	41.50	46.00	36.50	70.20
6/20/2023 23:01:44	43.90	39.10	41.60	45.40	37.80	72.50	41.50	51.80	37.70	72.60
6/20/2023 23:02:44	43.90	37.50	41.10	47.00	37.20	60.60	41.00	48.20	36.70	60.40
6/20/2023 23:03:44	43.30	37.60	39.80	45.50	36.70	69.30	39.60	46.50	36.20	69.40
6/20/2023 23:04:44	45.20	39.10	42.20	46.60	38.00	70.30	42.20	48.20	37.40	70.30
6/20/2023 23:05:44	43.70	38.20	40.90	45.00	37.50	71.00	40.70	47.20	36.70	70.90
6/20/2023 23:06:44	44.30	38.10	41.30	45.40	37.50	72.70	41.10	52.30	36.90	72.60
6/20/2023 23:07:44	41.00	37.10	38.80	44.60	36.70	73.70	38.70	48.70	36.00	73.80
6/20/2023 23:08:44	42.50	37.90	40.00	44.50	37.40	77.50	39.90	51.20	36.70	77.30

S179_BIU070007_20062023_230957: Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		46.60	45.30	44.90	44.70	44.50	44.30	44.20	44.00	43.90
10%	43.80	43.60	43.50	43.30	43.20	43.10	42.90	42.90	42.80	42.70
20%	42.60	42.50	42.50	42.40	42.30	42.20	42.10	42.10	42.00	41.90
30%	41.80	41.70	41.70	41.60	41.50	41.40	41.40	41.30	41.20	41.20
40%	41.10	41.00	41.00	40.90	40.80	40.70	40.70	40.60	40.50	40.50
50%	40.40	40.30	40.20	40.20	40.10	40.00	39.90	39.80	39.80	39.70
60%	39.60	39.60	39.50	39.50	39.40	39.30	39.30	39.20	39.20	39.10
70%	39.00	39.00	38.90	38.80	38.80	38.70	38.70	38.60	38.50	38.40
80%	38.40	38.30	38.20	38.20	38.10	38.00	37.90	37.80	37.80	37.70
90%	37.60	37.50	37.50	37.40	37.30	37.20	37.10	37.00	36.90	36.70
100%	36.10									

S179_BIU070007_20062023_230957: Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
36.00	0.00	0.00	0.02	0.07	0.07	0.05	0.03	0.35	0.67	0.65	1.93
37.00	0.81	0.65	0.89	1.11	1.30	1.27	1.37	1.31	1.28	1.18	11.17
38.00	1.20	1.29	1.28	1.60	1.35	1.26	1.25	1.28	1.78	1.78	14.06
39.00	1.65	1.51	1.40	1.87	1.70	1.29	1.63	1.85	1.66	1.58	16.14
40.00	1.62	0.81	1.21	1.25	1.28	1.44	1.27	1.30	1.62	1.31	13.11
41.00	1.31	1.43	1.49	1.40	1.46	1.52	1.51	1.31	1.22	1.15	13.80
42.00	1.24	1.26	1.28	1.22	1.30	1.38	1.15	1.07	1.28	1.31	12.50
43.00	1.43	0.47	0.88	0.84	0.67	0.76	0.79	0.73	0.61	0.81	7.99
44.00	0.83	0.75	0.65	0.56	0.66	0.57	0.53	0.49	0.48	0.43	5.97
45.00	0.38	0.33	0.24	0.22	0.16	0.15	0.13	0.10	0.09	0.05	1.85
46.00	0.06	0.07	0.06	0.08	0.09	0.06	0.05	0.05	0.09	0.05	0.66
47.00	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.01	0.02	0.22
48.00	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.13
49.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.08
50.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
51.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
52.00	0.01	0.01	0.02	0.03	0.05	0.02	0.00	0.00	0.00	0.00	0.16
53.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
54.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03

	Lavg-1	Lmax-1	Lmin-1
Min	38.80		36.20
Max	43.30	54.70	