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

Bowerman Power LFG, LLC

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September 2024

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Table of Contents

Table of Appendices

List of Figures

List of Tables

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.

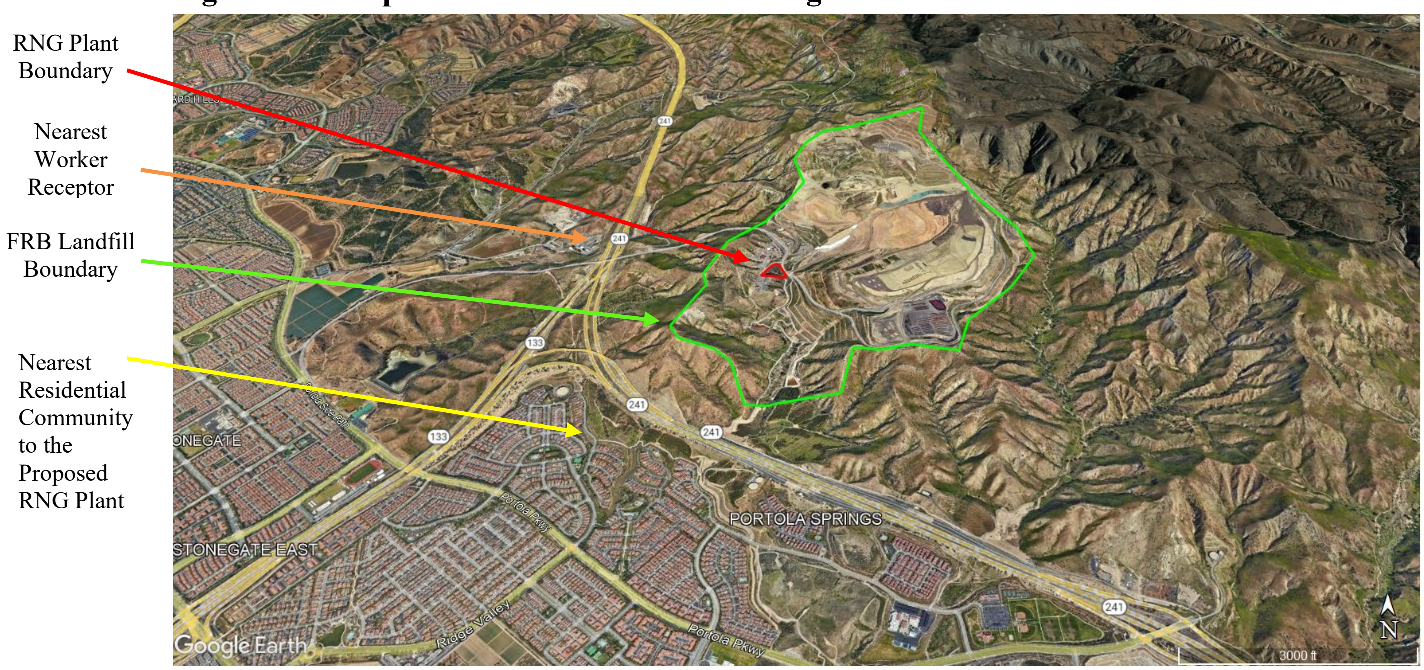
- A 32.9 Million British Thermal Units (MMBTU)/hr (at High Heating Value or HHV) Low-Nitrogen Oxides (NOx) thermal oxidizer, also referred to herein as a Thermal Oxidizer Unit (TOU), to continuously destroy streams of low-BTU tail gases that are produced from LFGTS; with up to 280 scfm natural gas as 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.

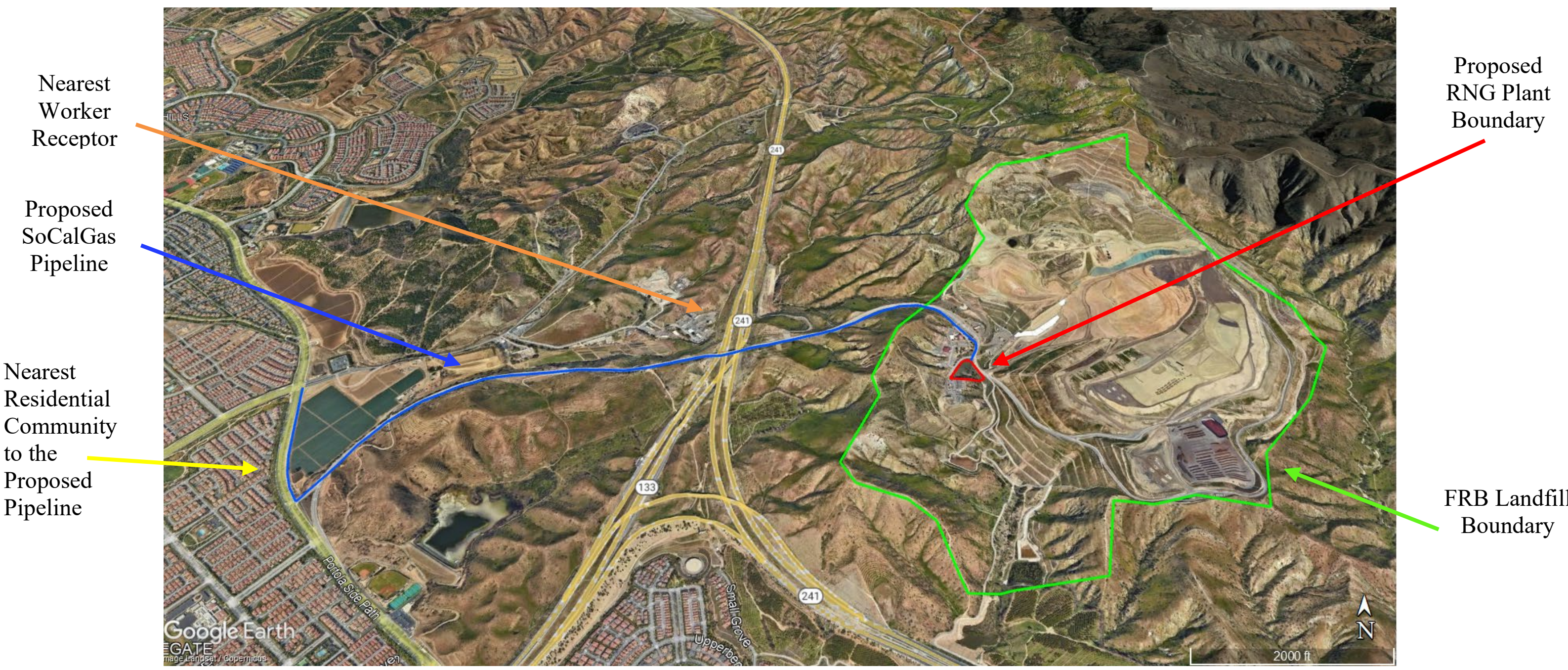
Figure 1-1: Proposed RNG Plant Location Diagram



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 (3^{rd} 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 (95^{th} percentile) for children from the third trimester through age 2 and 80^{th} 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 (95^{th} percentile) for children from the third trimester through age 2 and 80^{th} 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

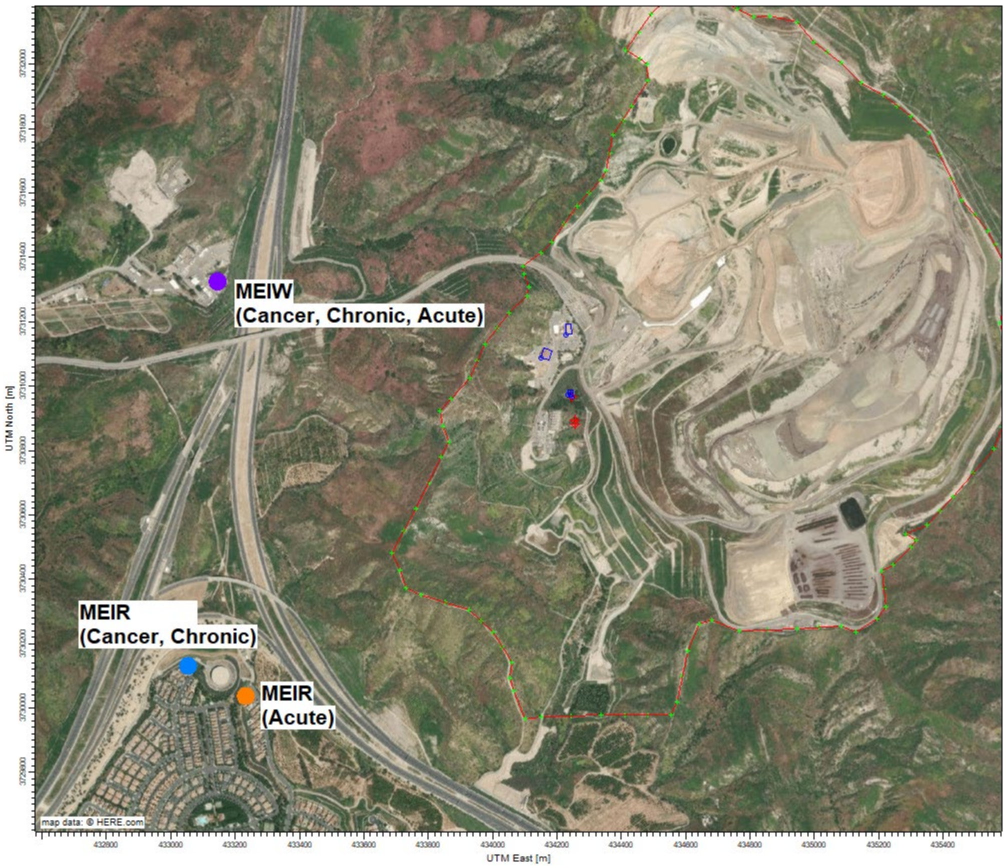
Parameter	Assumptions				Comments
Multi-Pathway					
Inhalation	Res	☒	Work	☒	–
Soil	Res	☒	Work	☒	–
Dermal	Res	☒	Work	☒	"Warm" climate
Mother's Milk	Res	☒	Work	☐	–
Drinking Water	Res	☐	Work	☐	–
Fish	Res	☐	Work	☐	–
Homegrown Produce	Res	☒	Work	☐	Default for "Households that Garden"
Beef/Dairy	Res	☐	Work	☐	–
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.

7.0 REFERENCES

Association of Environmental Professionals (AEP). 2016. Final White Paper Beyond 2020 and Newhall: A field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California. Website (https://califaep.org/docs/AEP-2016_Final_White_Paper.pdf)

California Air Resources Board (CARB). 2022a. 2022 Scoping Plan for Achieving Carbon Neutrality. Website (https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents).

California Air Resources Board (CARB). 2022b. Hotspots Analysis and Reporting Program Version 2 (HARP2) Air Dispersion Modeling and Risk Tool (ADMRT). Website (https://ww2.arb.ca.gov/our-work/programs/hot-spots-analysis-reporting-program).

California Office of Environmental Health Hazard Assessment (OEHHA). 2015. Air Toxics Hot Spots Program, Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments. Website (https://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0).

California Department of Resources Recycling and Recovery (CalRecycle). 2016. Solid Waste Cleanup Program Weights and Volumes for Project Estimates. Website (https://www.calrecycle.ca.gov).

California Emissions Estimation Model® (CalEEMod). 2022. Version 2022.1.1.28 Website (http://www.caleemod.com/).

California Energy Commission (CEC). 2022. Building Energy Efficiency Program. Website (https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency).

City of Irvine. 2023. Climate Action and Adaptation Plan. Website (https://www.cityofirvine.org/environmental-programs/climate-planning).

Southern California Association of Governments (SCAG). 2024. The 2024-2050 Regional Transportation Plan/ Sustainable Communities Strategy. Website (scag.ca.gov/sites/main/files/file-attachments/23-2987-connect-socal-2024-final-complete-040424.pdf?1714175547

South Coast Air Quality Management District (SCAQMD). 2023. Air Quality Significance Thresholds. Website (https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf?sfvrsn=25).

South Coast Air Quality Management District (SCAQMD). 2022. Air Quality Management Plan. Website (http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16).

South Coast Air Quality Management District (SCAQMD). 2008a. Localized Significance Threshold Methodology. Website (http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf?sfvrsn=2).

South Coast Air Quality Management District (SCAQMD). 2008b. Interim CEQA GHG Significance Threshold for Stationary Sources, Rules, and Plans. Website (http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=2).

South Coast Air Quality Management District (SCAQMD). 2003. South Coast AQMD Cumulative Impacts Working Group, White Paper on Potential Control Strategies to Address Cumulative Impacts From Air Pollution, August 2003, Appendix D, Cumulative Impact Analysis Requirements Pursuant to CEQA, at D-3. Website (http://www.aqmd.gov/docs/default-source/Agendas/Environmental-Justice/cumulative-impacts-working-group/cumulative-impacts-white-paper.pdf).

South Coast Air Quality Management District (SCAQMD). 2017. Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.1. Website (http://www.aqmd.gov/docs/default-source/permitting/rule-1401-risk-assessment/riskassessproc-v8-1.pdf?sfvrsn=12).

South Coast Air Quality Management District (SCAQMD). 2016. Data for AERMOD & Version 9 Meteorological Stations List/Map. Website (https://www.aqmd.gov/home/air-quality/meteorological-data/data-for-aermod).

South Coast Air Quality Management District (SCAQMD). 2006. SCAQMD Modeling Guidance for AERMOD. Website (http://www.aqmd.gov/home/air-quality/meteorological-data/modeling-guidance).

United States Environmental Protection Agency (EPA). 2024. Nitrogen Dioxide/Nitrogen Oxide In-Stack Ratio (ISR) Database. Website (https://www.epa.gov/scram/nitrogen-dioxidenitrogen-oxide-stack-ratio-isr-database).

United States Environmental Protection Agency (EPA). 2022. AERMOD Modeling System. Website (https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models).

United States Environmental Protection Agency (EPA). 2012. Haul Road Workgroup Final Report. March 2, 2012. Website (https://www.epa.gov/sites/default/files/2020-10/documents/haul_road_workgroup-final_report_package-20120302.pdf).

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

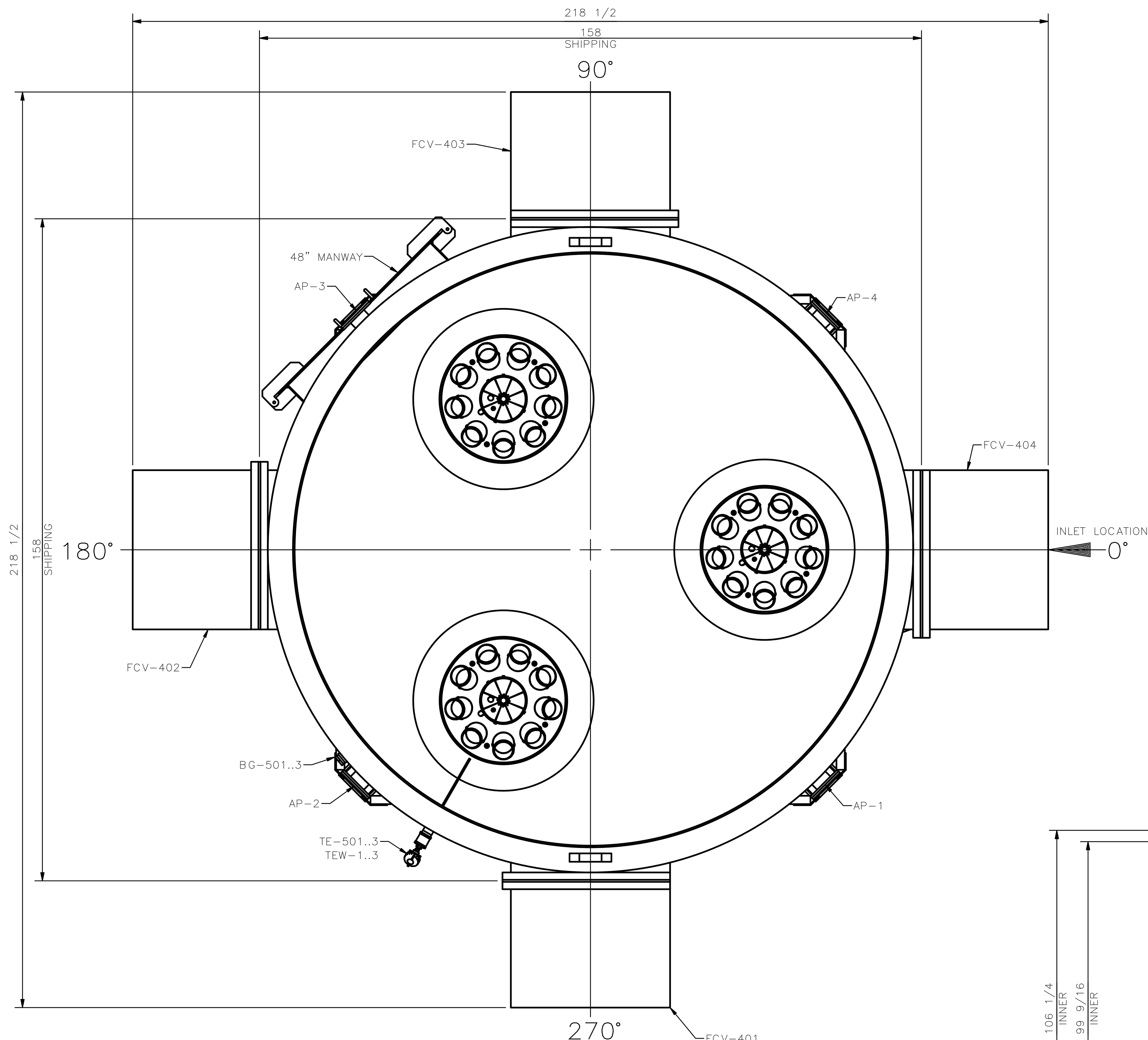
Equipment Data Sheet

120.0 MMBTU Flare

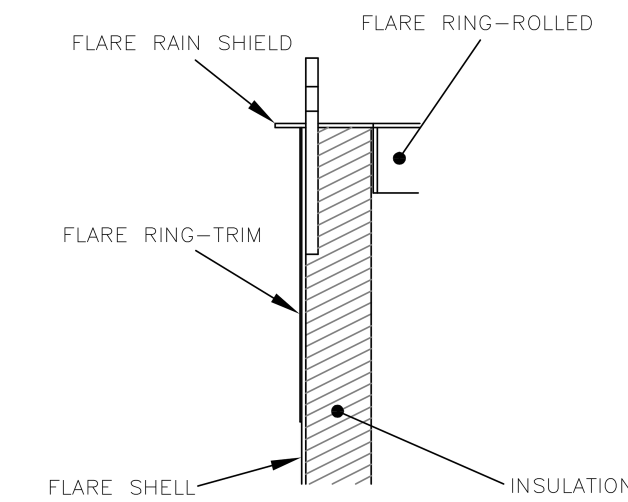
Spec. #	2125
Sheet #	1 Of 1
By:	Kristi Wade
Date:	05 April 2024

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:



PLAN VIEW
SCALE 1:20



TYP TOP CROSS SECTION
SCALE: NTS

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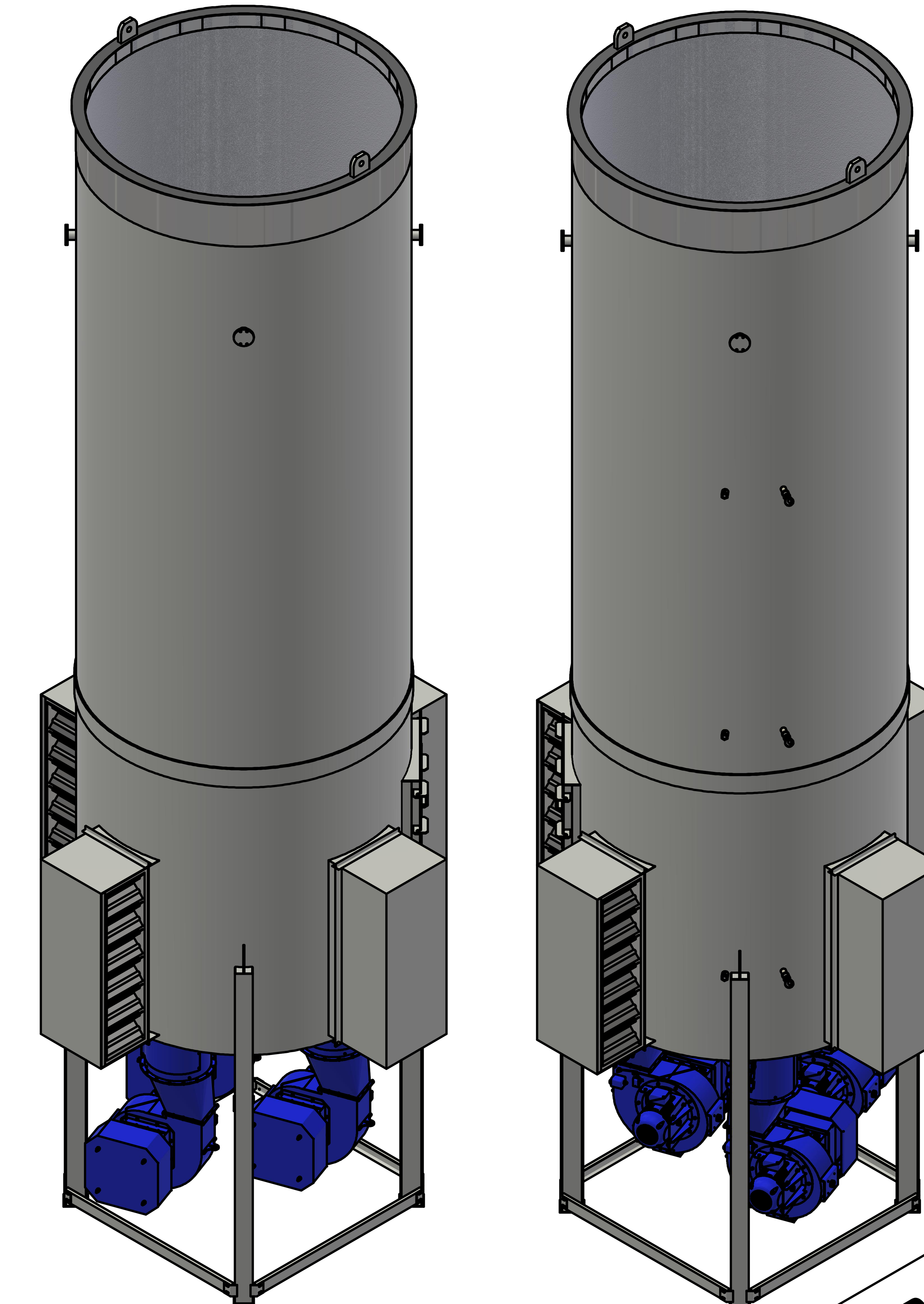
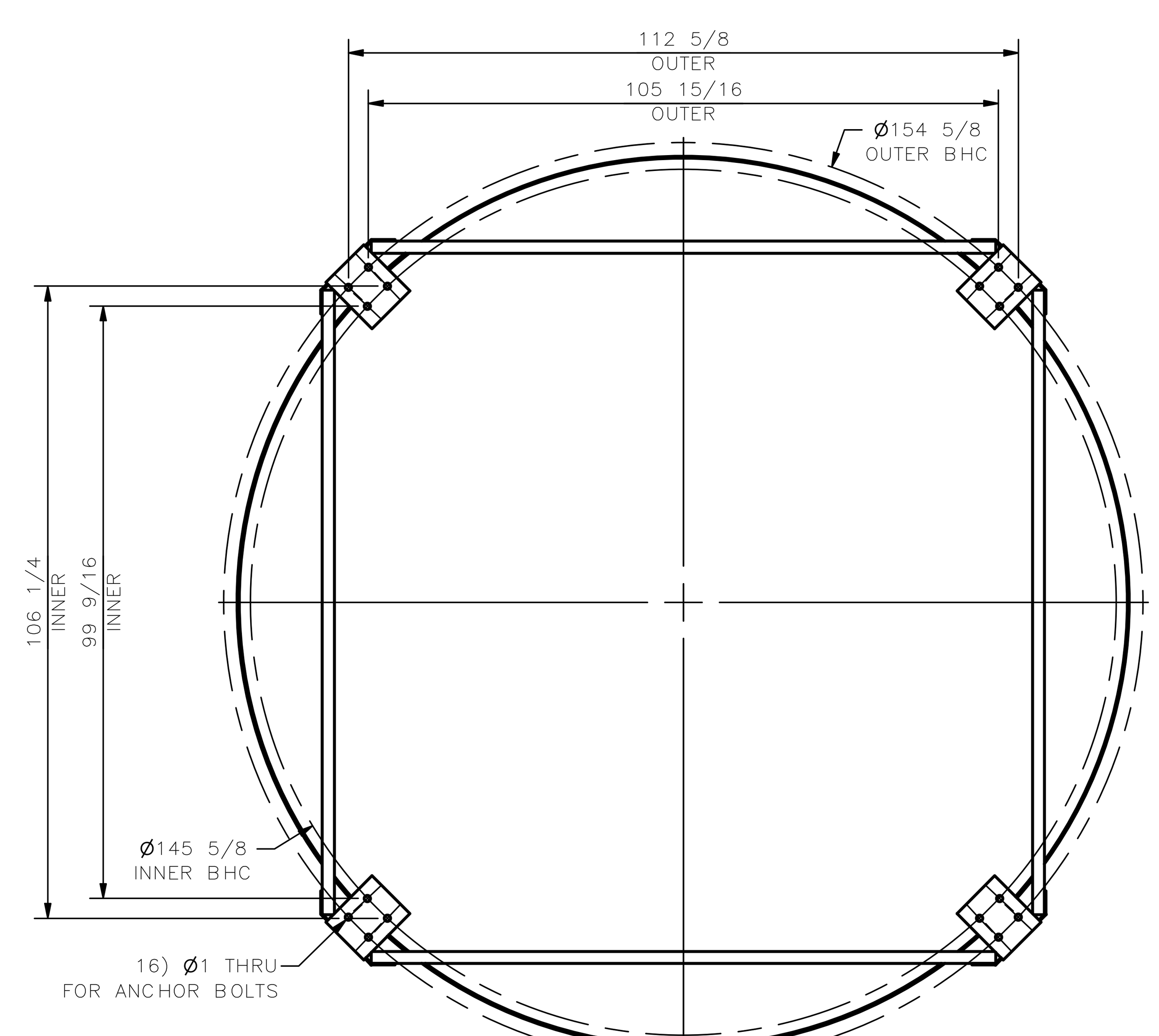
ONLY
PERENNIAL ENERGY, LLC



ISOMETRIC VIEWS
SCALE 1:50

REDUCED
FROM ORIGINAL
SIZE



FOOT LAYOUT
SCALE 1:25

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

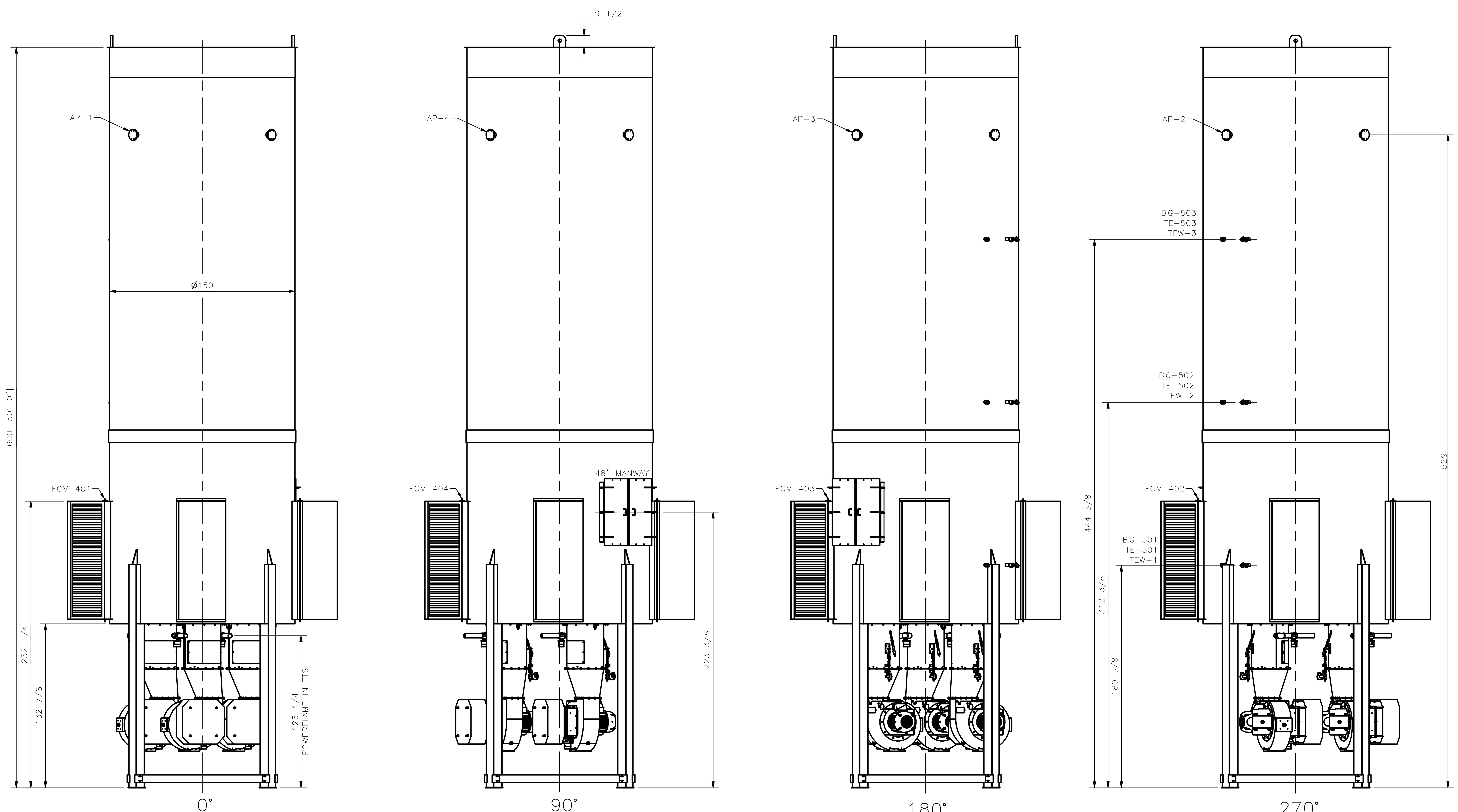
ENGINEERING SIGNATURES
DESIGNED BY: K.WADE DATE: 4/19/24
DRAWN BY: D.SMITH DATE: 4/19/24

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
FRACT ±1/16 .XX ±.03 ANGLES ±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

PRELIMINARY
FOR REVIEW/INFO.
ONLY
PERENNIAL ENERGY, LLC

REDUCED
FROM ORIGINAL
SIZE

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

TITLE: FLARE TOP ASSEMBLY
150"OD x 600" TALL

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
FRACT ±1/16 .XX ±.03 ANGLES ±0°30'

SIZE D DWG. NO. PA-001-1363

MATERIAL: AS NOTED
SCALE: AS NOTED
FILE NO. PA-001-1363.dwg
SHEET 2 OF 2

4/19/2024 10:07:32 AM O:\ACADF\2101-2150\2125 FRB Landfill RNG Off-Spec Flare\PA-001-1363.dwg D.SMITH

Equipment Data Sheet

32.9 MMBTU/H Thermal Oxidizer

Job # **2126-TOU**
Sheet # **1** Of **1**

By: **Kristi Wade**

Date: **14 May 2024**

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.

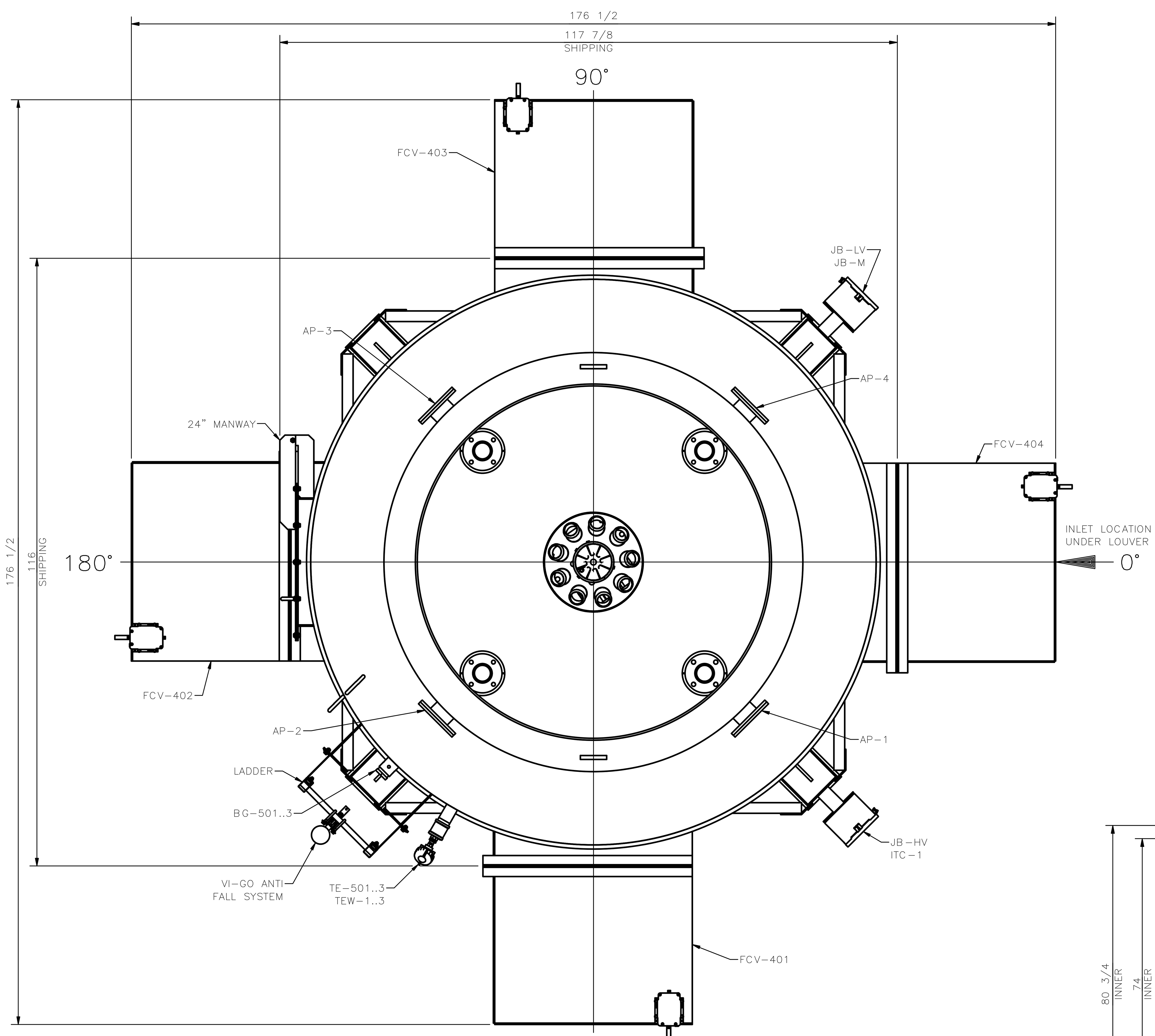
Please note: Mineral based particulates, such as wind-blown dust or silica, can be entrained into the ambient cooling and quenching air or purge air streams and passed into the combustor. As non-combustible matter, they will be passed into the exhaust stream and will be measured as particulate emissions, 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:

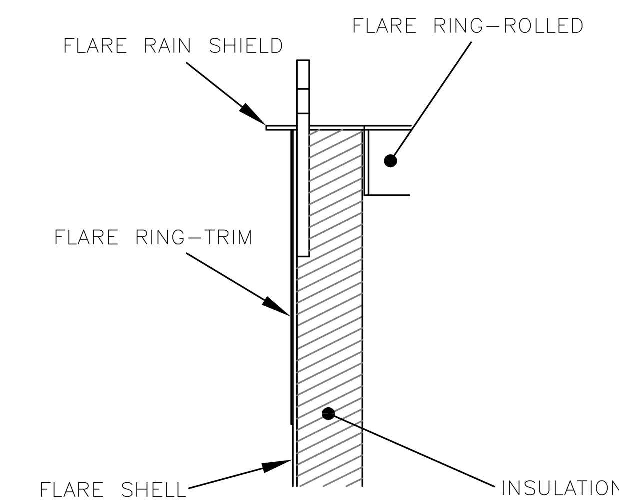
NOX emission rates are exclusive of fixed nitrogen in the fuel or injected in condensate, leachate, or other sources.

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 SiO_2. PEI makes no guarantees regarding these particulates, or particulates formed from the combustion of other non-methane constituents in the gas stream.

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
SCALE 1:15



TYP TOP CROSS SECTION
SCALE: NTS

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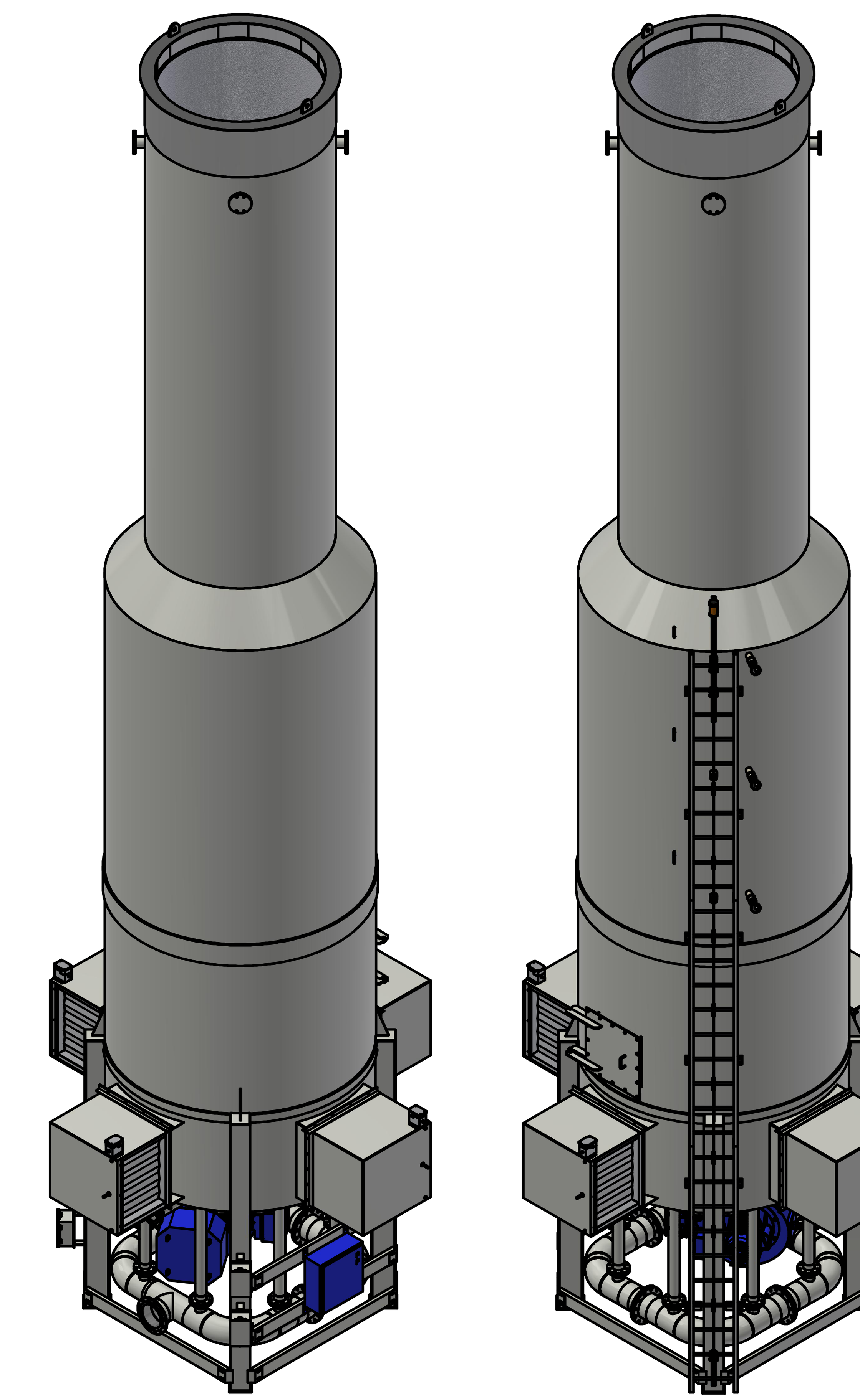
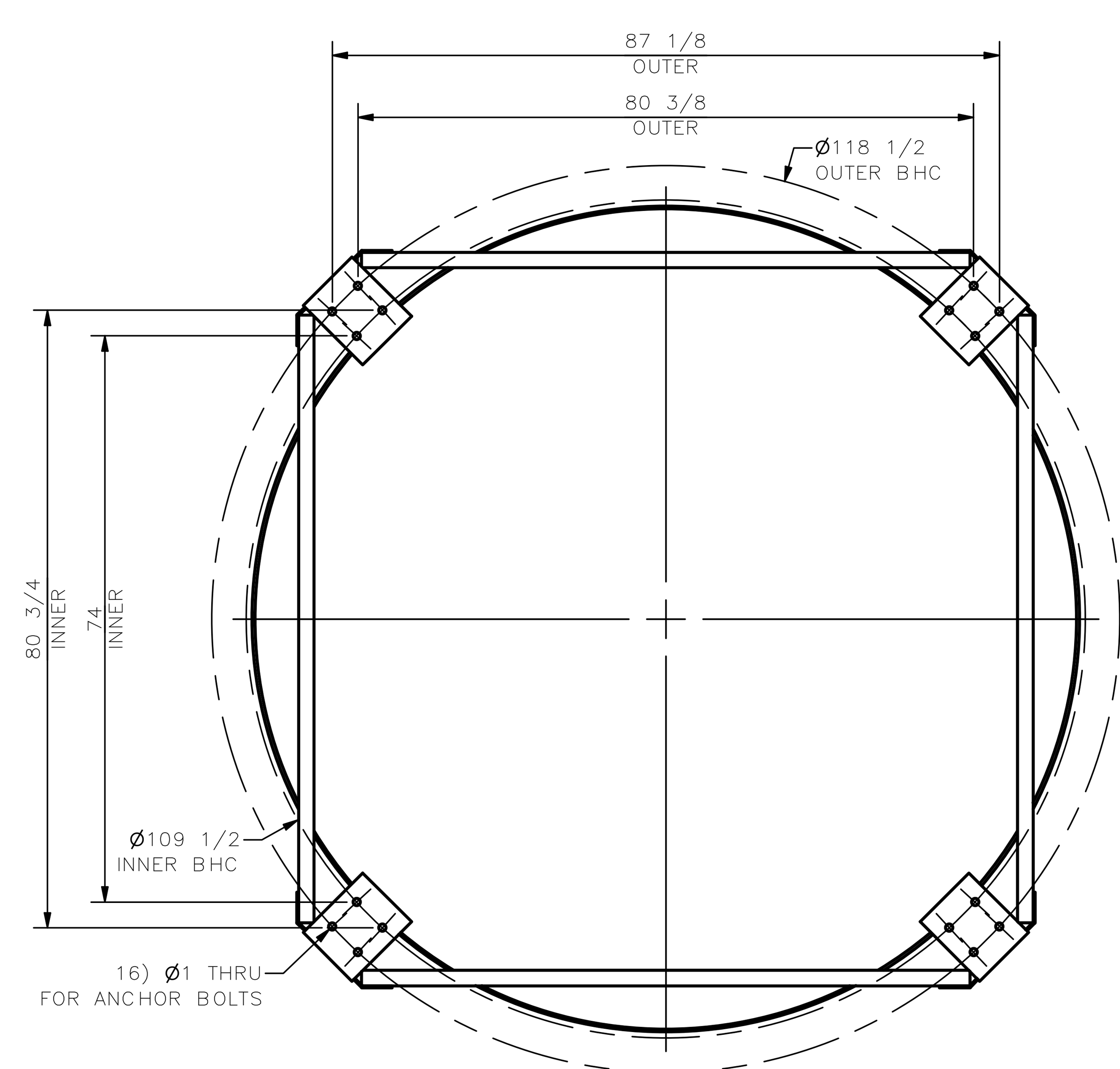
FOR REVIEW/INFO.
ONLY
PERENNIAL ENERGY, LLC



ISOMETRIC VIEWS
SCALE 1:50

REDUCED
FROM ORIGINAL
SIZE



FOOT LAYOUT
SCALE 1:20

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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

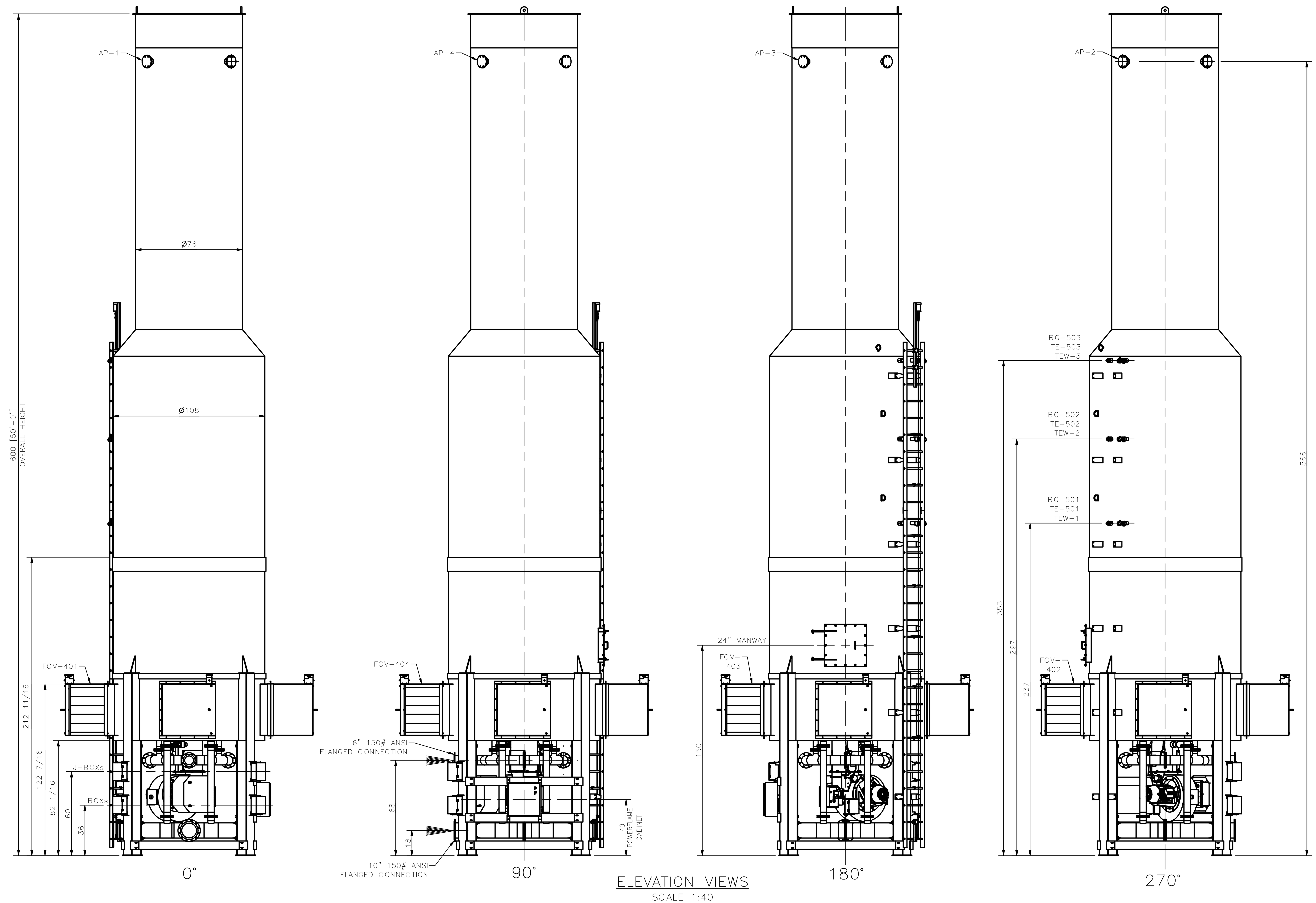
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
FRACT .XX ANGLES
±1/16 ±.03 ±0°30

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

4/18/2024 8:18:07 AM O:\ACADFV\2101-2150\2126 FRB Landfill RNG TOU\PA-001-1380.dwg D.SMITH



ELEVATION VIEWS
SCALE 1:40

PRELIMINARY FOR REVIEW/INFO. ONLY PERENNIAL ENERGY, LLC

REDUCED FROM ORIGINAL SIZE

LTR	DESCRIPTION	DATE	APPROVED
0			

REVISIONS

APPLICABLE JOB NO(S). 2126
FRB LANDFILL RNG TOU

PEI PERENNIAL ENERGY
1375 COUNTY ROAD 8690
WEST PLAINS, MO 65775
www.PerennialEnergy.com

This Drawing Contains Proprietary Data and May Not Be Duplicated, Copied, Reproduced or Otherwise Used In Any Manner Not in the Best Interest of Perennial Energy LLC. All Ideas and Concepts Remain the Property of Perennial Energy LLC.

ENGINEERING SIGNATURES

		DATE
DESIGNED BY:	K.WADE	4/18/24
DRAWN BY:	D.SMITH	4/18/24

TITLE: TOU TOP ASSEMBLY 108"OD x 600" TALL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
FRACT ±1/16 .XX ±.03 ANGLES ±0°30

SIZE D DWG. NO. PA-001-1380

MATERIAL: AS NOTED | SCALE: AS NOTED | FILE NO. PA-001-1380.dwg | SHEET 2 OF 2

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

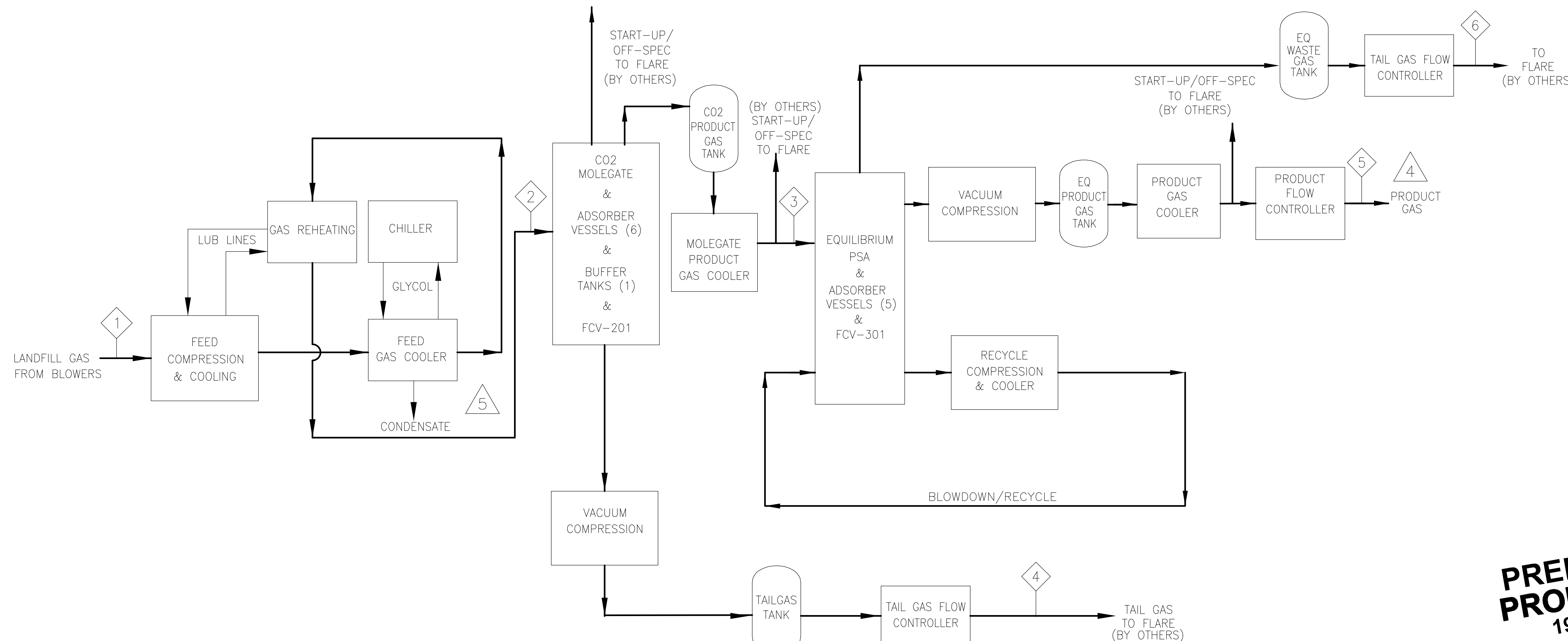
PROJECT NO.
164.02

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. (△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. (△4) PRODUCT GAS SPECIFICATION
   - TEMPERATURE: 40–120°F
   - (3) CONSECUTIVE GC READINGS BEFORE SHUT-IN
   - HIGHER HEATING VALUE (HHV): > 970 BTU/SCF
   - CARBON DIOXIDE (CO_2) CONTENT: <3.0%
   - HYDROGEN SULFIDE (H_2S) CONTENT: <4 PPM (0.25 GR/100SCF)
   - TOTAL INERTS ($N_2+O_2+CO_2$) CONTENT: <4.0%
   - OXYGEN (O_2) CONTENT: <0.20%
   - NITROGEN (N_2) CONTENT: <3.0%
   - WATER (H_2O) CONTENT: <7 LBS/MMSCF (<147 PPM)
5. (△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

REVISIONS				
REV	DESCRIPTION	DATE	DRAWN	APPROVED



PRELIMINARY
PROPRIETARY
19 MAY 2023

GENERAL DATA	
LOCATION	IRVINE, CA
ELEVATION (FEET)	72
BARO PRESSURE (PSIA)	14.67
AMBIENT TEMP (°F)	20 TO 104 °F

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: D | CODE IDENT. NO.: 4X630 | DWG. NO.: MGXXX–00009 | REV.: 3
SCALE: N/A | WEIGHT: | SHEET 1 OF 1

DWG NO 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
TDarjazanie@YorkeEngr.com | V-card Link

Yorke Engineering, LLC | Corporate Office
31726 Rancho Viejo Road, Suite 218, San Juan Capistrano, CA 92675
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

www.montaukrenewables.com

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

EXTERNAL EMAIL: This email originated from outside YorkeEngr.com. Please use caution.

Don,
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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,

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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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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

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Vahe,
One modification to my response below. Please change the natural gas consumption on the TOU to a **maximum of 280 SCFM**.

Thank you!

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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?

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- 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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Yorke
ENGINEERING, LLC

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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

EXTERNAL EMAIL: This email originated from outside YorkeEngr.com. Please use caution.

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

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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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Yorke ENGINEERING, LLC

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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
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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	FUEL PRESSURE RANGE(psig):	0.3-0.4
COOLING SYSTEM:	JW, OC, AC	FUEL METHANE NUMBER:	85
CONTROL SYSTEM:	EIS	FUEL LHV (Btu/scf):	905
EXHAUST MANIFOLD:	DRY	ALTITUDE CAPABILITY AT 79°F INLET AIR TEMP. (ft):	2152
COMBUSTION:	INTEGRATED CATALYST	POWER FACTOR:	0.8
FAN POWER (bhp):	13	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

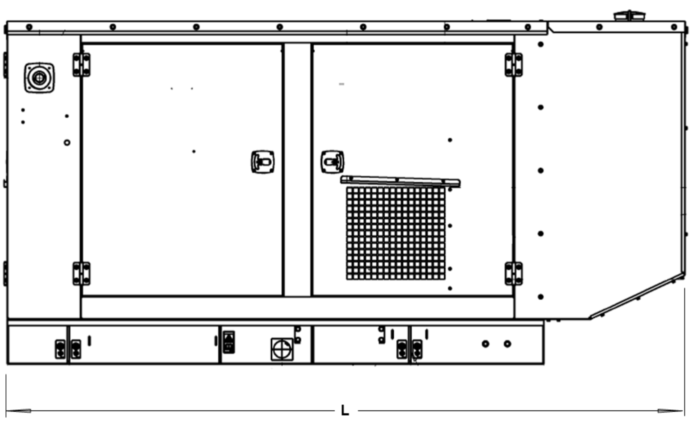
- Skid base compatible
- DC lighting package (Optional)

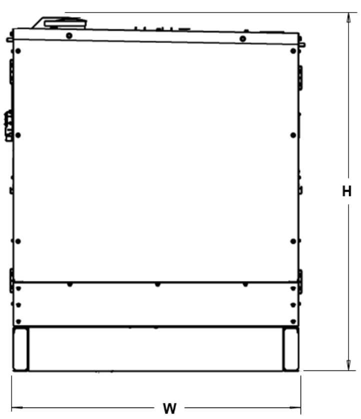
Weights & Dimensions

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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APPENDIX C – CONSTRUCTION HRA MODELING RESULTS

Model
Cancer Risk
Chronic Risk

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%

9/9/2024

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%

9/9/2024

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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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Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
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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Facility: Bowerman Power LFG, LLC

Bowerman Power LFG, LLC / FRB
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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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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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

[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

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

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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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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

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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

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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

[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)

Gas Consumption (mmscf/hr)	Gas Consumption (mmscf/yr)
0.0001	0.8343

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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

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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)

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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)
NO_x[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
SO_x[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

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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

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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)

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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

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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

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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

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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

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Source Locations

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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).

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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

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Appendix E Air Quality Impact Analysis

Table E.3 Dispersion Model Options/Assumptions

<table>
<tr><th>Parameter</th><th colspan="4">Value</th><th>Comments</th></tr>
<tr><td colspan="6">Control Pathway</td></tr>
<tr><td>Regulatory Options</td><td>Default</td><td>☒</td><td>Non-Default</td><td>☐</td><td>--</td></tr>
<tr><td rowspan="2">Output Type</td><td>Concentration</td><td>☒</td><td>Dry Deposition</td><td>☐</td><td rowspan="2">--</td></tr>
<tr><td>Total Deposition</td><td>☐</td><td>Wet Deposition</td><td>☐</td></tr>
<tr><td rowspan="2">Depletion Options</td><td>Dry Depletion</td><td>☐</td><td>Wet Depletion</td><td>☐</td><td rowspan="2">--</td></tr>
<tr><td>Disable Dry Depletion</td><td>☐</td><td>Disable Wet Depletion</td><td>☐</td></tr>
<tr><td>Pollutant</td><td colspan="4">Other</td><td>--</td></tr>
<tr><td>Averaging Time Options</td><td colspan="4">1-Hour (H1H); 8-Hour (H1H); 24-Hour (H1H); Annual (Avg)</td><td>Model output also includes the max annual average for each MET year.</td></tr>
<tr><td>Dispersion Coefficient</td><td>Rural</td><td>☐</td><td>Urban</td><td>☒</td><td>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.</td></tr>
<tr><td rowspan="3">Terrain Height Options</td><td colspan="2">Elevated</td><td colspan="2">☒</td><td rowspan="3">--</td></tr>
<tr><td colspan="4">Non-Default Regulatory Options</td></tr>
<tr><td>Flat</td><td>☐</td><td>Flat & Elevated</td><td>☒</td></tr>
<tr><td>Receptor Elevations / Hill Heights</td><td colspan="4">Run AERMOD using the AERMAP Receptor Output file (*.ROU)</td><td>--</td></tr>
</table>

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Appendix E Air Quality Impact Analysis

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.

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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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Appendix E Air Quality Impact Analysis

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

C:\Lakes\AERMOD View\Bowerman_RNG_Facility_CEQA_HRA\Bowerman_RNG_Fac Air Quality Impact Analysis - FRB RNG Facility Operational Emissions

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	

C:\Lakes\AERMOD View\Bowerman_RNG_Facility_CEQA_HRA\Bowerman_RNG_Fac Air Quality Impact Analysis - FRB RNG Facility Operational Emissions

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

C:\Lakes\AERMOD View\Bowerman_RNG_Facility_CEQA_HRA\Bowerman_RNG_Fac Air Quality Impact Analysis - FRB RNG Facility Operational Emissions

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	

C:\Lakes\AERMOD View\Bowerman_RNG_Facility_CEQA_HRA\Bowerman_RNG_Fac Air Quality Impact Analysis - FRB RNG Facility Operational Emissions

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

C:\Lakes\AERMOD View\Bowerman_RNG_Facility_CEQA_HRA\Bowerman_RNG_Fac Air Quality Impact Analysis - FRB RNG Facility Operational Emissions

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] No. Days of Data	Carbon Monoxide[a] Max 1-Hour Conc., ppm	Carbon Monoxide[a] Max 8-Hour Conc., ppm	Ozone[b] No. Days of Data	Ozone[b] Max 1-Hour Conc., ppm	Ozone[b] Max 8-Hour Conc., ppm	Ozone[b] Fourth High 8-Hour Conc., ppm	Ozone[b] Number of Days Standard Exceeded: 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	Nitrogen Dioxide[c] No. Days of Data	Nitrogen Dioxide[c] Max 1-Hour Conc., ppb	Nitrogen Dioxide[c] 98th Percentile 1-Hour Conc., ppb	Nitrogen Dioxide[c] Annual Average (AAM) Conc., ppb	Sulfur Dioxide[d] No. Days of Data	Sulfur Dioxide[d] Max 1-Hour Conc., ppb	Sulfur Dioxide[d] 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
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 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., $\mu g/m^3$	No. (%) Samples Exceeding Federal 24-Hour 150 $\mu g/m^3$	No. (%) Samples Exceeding State 24-Hour 50 $\mu g/m^3$	Annual Average Conc.[h] (AAM), $\mu g/m^3$	No. Days of Data	Max 24-Hour Conc., $\mu g/m^3$	98th Percentile 24-Hour Conc., $\mu g/m^3$	No. (%) Samples Exceeding Federal 24-Hour Standard 35 $\mu g/m^3$	Annual Average Conc.[j] (AAM), $\mu g/m^3$	Max Monthly Average Conc., $\mu g/m^3$	Max 3-Month Rolling Average Conc., $\mu g/m^3$	No. Days of Data	Max 24-Hour Conc., $\mu g/m^3$
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 $\mu g/m^3$ – 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 $\mu g/m^3$) 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 $\mu g/m^3$. Federal annual PM10 standard (50 $\mu g/m^3$) 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 $\mu g/m^3$.

k) Lead is measured in Total Suspended Particulate (TSP) samples. Federal lead standard is 3-months rolling average (0.15 $\mu g/m^3$); state standard is monthly average (1.5 $\mu g/m^3$). 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 $\mu g/m^3$ and 0.057 $\mu g/m^3$, respectively. Lead standards were not exceeded at any site.

l) State 24-hour sulfate standard is 25 $\mu g/m^3$. 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] No. Days of Data	Carbon Monoxide[a] Max 1-Hour Conc., ppm	Carbon Monoxide[a] Max 8-Hour Conc., ppm	Ozone[b] No. Days of Data	Ozone[b] Max 1-Hour Conc., ppm	Ozone[b] Max 8-Hour Conc., ppm	Ozone[b] Fourth High 8-Hour Conc., ppm	Ozone[b] Number of Days Standard Exceeded: 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	Nitrogen Dioxide[c] No. Days of Data	Nitrogen Dioxide[c] Max 1-Hour Conc., ppb	Nitrogen Dioxide[c] 98th Percentile 1-Hour Conc., ppb	Nitrogen Dioxide[c] Annual Average (AAM) Conc., ppb	Sulfur Dioxide[d] No. Days of Data	Sulfur Dioxide[d] Max 1-Hour Conc., ppb	Sulfur Dioxide[d] 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.

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 2022 Air Quality Management Plan, which can be accessed at http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan#. A map showing the source/receptor area boundaries and station locations is available at www.aqmd.gov/aqcard2022map. The South Coast AQMD Monitoring Network Plan is available at https://www.aqmd.gov/home/air-quality/clean-air-plans/monitoring-network-plan.

2022 AIR QUALITY
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

2022

Source/Receptor Area No.	Location	AQS Station ID	Suspended Particulates PM10[g] No. Days of Data	PM10 Max 24-Hour Conc., µg/m^3	PM10 No. (%) Samples Exceeding Federal 24-Hour > 150 µg/m^3	PM10 No. (%) Samples Exceeding State 24-Hour > 50 µg/m^3	PM10 Annual Average Conc.[h] (AAM), µg/m^3	Fine Particulates PM2.5[i] No. Days of Data	PM2.5 Max 24-Hour Conc., µg/m^3	PM2.5 98th Percentile 24-Hour Conc., µg/m^3	PM2.5 No. (%) Samples Exceeding Federal 24-Hour Standard > 35 µg/m^3	PM2.5 Annual Average Conc.[j] (AAM), µg/m^3	Lead[k] Max Monthly Average Conc., µg/m^3	Lead Max 3-Month Rolling Average Conc., µg/m^3	PM10 Sulfate[l] No. Days of Data	PM10 Sulfate Max 24-Hour Conc., µg/m^3
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														
4	South Coastal LA County 1*	060374002						55	20.0	18	0 (0%)	9.92				
4	South Coastal LA County 2*	060374004	20	48	0 (0%)	0 (0%)	25.5	120	26.1	20	0 (0%)	10.66	0.007	0.006		
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/m^3 – 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/m^3) 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/m^3. Federal annual PM10 standard (AAM > 50 µg/m^3) 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/m^3.

k) Lead is measured in Total Suspended Particulate (TSP) samples. Federal lead standard is 3-months rolling average > 0.15 µg/m^3; state standard is monthly average > 1.5 µg/m^3. 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/m^3 and 0.037 µg/m^3, respectively. Lead standards were not exceeded at any site.

l) State 24-hour sulfate standard is > 25 µg/m^3. 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) No. Days of Data	Max Conc. in ppm 1-hour	Max Conc. in ppm 8-hour	Ozone b) No. Days of Data	Max. Conc. in ppm 1-hour	Max. Conc. in ppm 8-hour	Fourth High Conc. ppm 8-hour	Number of Days Standard Exceeded: 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	Nitrogen Dioxide c) No. Days of Data	Max Conc. in ppb 1-hour	98th Percentile Conc. ppb 1-hour	Annual Average AAM Conc. ppb	Sulfur Dioxide d) 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 AQMD
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) +]: No. Days of Data	PM10: Max. Conc. in μg/m^3 24-hour	PM10: No. (%) Samples Exceeding Standards Federal > 150 μg/m^3 24-hour	PM10: No. (%) Samples Exceeding Standards State > 50 μg/m^3 24-hour	PM10: Annual. Average Conc. [f)] (AAM) μg/m^3	Fine Particulates PM2.5 [g) #]: No. Days of Data	PM2.5: Max. Conc. in μg/m^3 24-hour	PM2.5: 98th Percentile Conc. in μg/m^3 24-hour	PM2.5: No (%) Samples Exceeding Federal Std. > 35 μg/m^3 24-hour	PM2.5: Annual. Average Conc. [h)] (AAM) μg/m^3	Lead [i) ++]: Max. Monthly Average Conc. μg/m^3	Lead: Max. 3-Months Rolling Averages μg/m^3	PM10 Sulfate [j)]: No. Days of Data	PM10 Sulfate: Max. Conc. in μg/m^3 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/m^3 – Micrograms per cubic meter of air AAM – Annual Arithmetic Mean -- Pollutant not monitored

+ High PM10 (≥ 155 μg/m^3) 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/m^3. Federal annual PM10 standard (50 μg/m^3) 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/m^3.

i) Federal lead standard is 3-months rolling average > 0.15 μg/m^3; state standard is monthly average ^{3} 1.5 μg/m^3. Lead standards were not exceeded.

j) State sulfate standard is 24-hour ^{3} 25 μg/m^3. 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/m^3 and 0.059 μg/m^3, 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: SO_2
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

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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

Yorke ENGINEERING, LLC
www.YorkeEngr.com

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%

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