

Appendix E

Air Quality Supporting Information

Air Quality Impact Analysis

East Cat Canyon Oil Field Redevelopment Project County of Santa Barbara

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Table of Contents

EXECUTIVE SUMMARY.....vii

1.0 INTRODUCTION..... 1

2.0 GENERAL PROJECT DESCRIPTION 1

3.0 SANTA BARBARA COUNTY ENVIRONMENTAL THRESHOLDS..... 4

4.0 REGULATORY AND ENVIRONMENTAL SETTING 7

5.0 PROJECT-IMPACT ANALYSIS FOR CRITERIA POLLUTANTS..... 25

6.0 CUMULATIVE IMPACTS 62

7.0 IMPACTS TO GLOBAL CLIMATE CHANGE 71

**8.0 CONSISTENCY WITH THE SANTA BARBARA COUNTY AIR POLLUTION
CONTROL DISTRICT CLEAN AIR PLAN..... 72**

9.0 MITIGATION MEASURES AND RESIDUAL IMPACTS..... 75

10.0 REFERENCES..... 79

List of Figures

Figure 2-1 - Project and Regional Location.....	3
Figure 2-2 - Project Site Aerial.....	4
Figure 4-1 - 2007 Unincorporated Santa Barbara County Greenhouse Gas Emissions by Sector	23
Figure 5-1 - Potential Sensitive Receptor Locations.....	49
Figure 8-1 - 2013 Clean Air Plan Summary	74

List of Tables

Table 4-1 - Federal and California Standards and Santa Barbara County Attainment Status.....	11
Table 4-2 - 2013 Climatic Data for the Project Area.....	15
Table 4-3 - Existing Air Quality Monitoring Data in Project Area	16
Table 4-4 - Global Warming Potential of Various Gases	22
Table 4-5 - 2012 Emission Inventory for Santa Barbara County.....	24
Table 5-1 - Grading Area and Cut and Fill Volumes by Year.....	26
Table 5-2 - Construction Vehicles Travel Distance by Year	26
Table 5-3 - Drilling Vehicles Travel Distance by Year	27
Table 5-4 – Replacement Well Drilling Vehicles Travel Distance by Year.....	29
Table 5-5 - Project Short Term Unmitigated Construction Emissions – By Year.....	29
Table 5-6 - 14-Mile Fuel Line Unmitigated Construction Emissions – By Year	30
Table 5-7 - 115KV Interconnect and Substation Unmitigated Construction Emissions – By Year	30
Table 5-8 - Drilling Short Term Unmitigated Construction Emissions – By Year.....	31
Table 5-9 – Replacement Well Drilling Short Term Unmitigated Construction Emissions – By Year	31
Table 5-10 - Short Term Unmitigated Construction Emissions – Peak Year	32
Table 5-11 - Project Short Term Mitigated Construction Emissions – By Year	33
Table 5-12 - 14-Mile Fuel Line Mitigated Construction Emissions – By Year.....	34
Table 5-13 - 115KV Interconnect and Substation Mitigated Construction Emissions – By Year.....	34
Table 5-14 - Drilling Short Term Mitigated Construction Emissions – By Year	35
Table 5-15 – Replacement Well Drilling Short Term Mitigated Construction Emissions – By Year.....	36
Table 5-16 - Short Term Mitigated Construction – Peak Year.....	37
Table 5-17 - 85 Million British Thermal Units Per Hour Steam Generator Emission Factors.....	41
Table 5-18 - 62.5 Million British Thermal Units Per Hour Steam Generator Emission Factors.....	42
Table 5-19 - 40 Million British Thermal Units Per Hour Flare Emission Factors.....	43
Table 5-20 - Internal Combustion Engine Emission Factors	43
Table 5-21 - Facility Component Counts.....	45
Table 5-22 - Long Term Unmitigated Operational Emissions – Peak Year	46
Table 5-23 - Long Term Operational Emissions after Mitigation – Peak Year	47
Table 5-24 - Operating Schedule for Flare and Emergency Generator.....	51
Table 5-25 - Required Cancer Risk Scenarios	55
Table 5-26 - Summary of Maximum Cancer Health Risk Impacts.....	56
Table 5- 27 - Summary of Maximum Chronic Non-Cancer Health Risk Impacts	56
Table 5- 28 - Summary of Maximum Acute Non-Cancer Health Risk Impacts.....	56
Table 5-29 - Summary of Maximum 8-Hour Chronic Non-Cancer Health Risk Impacts	57
Table 5-30 - Risk Drivers	57
Table 5-31 - Operating Schedule for Flare and Emergency Generator.....	59
Table 5-32 - Cumulative Impacts Vs. Ambient Air Quality Standards	61
Table 6-1 - Project Emissions Relative to 2012 Emission Inventory for South Central Coast Air Basin	62
Table 6-2 - Emission Inventory South Central Coast Air Basin 2020 Projection – Tons per Year.....	63
Table 6-3 - Emission Inventory South Central Coast Air Basin – Santa Barbara County Portion 2020 Projection – Tons per Year.....	63

Table 6-4 - 2020 Emissions Projections – Proposed Project and Santa Barbara County Air Pollution Control District – Tons per Year	63
Table 6-5 - Cumulative Oil and Gas Projects in the Project Vicinity	64
Table 6-6 - Cumulative Land Development Projects in North Santa Barbara County	65
Table 7-1 - Estimated Annual Mitigated Greenhouse Gas Emissions for Peak Year 2024 (Metric Tons/Year)	71
Table 8-1 - Evaluation of Project Consistency with 2013 Clean Air Plan.....	75

List of Attachments

A. Emissions Calculations and Support Documents

- Equipment Listings and Schedules
 - Construction Equipment Listing and Schedule
 - Drilling and Well Hookup Equipment Listing and Schedule
 - Construction Equipment Horsepower
 - Operations and Maintenance Vehicles and Equipment Listing
- Construction Emissions
 - Construction Equipment Emission
 - Construction Vehicle Travel Emission
 - Construction Fugitive Dust Emission
 - Construction Off-Site Emission
- Drilling Emissions
 - Drilling Equipment Emission
 - Drilling Fugitive Emission
 - Re-drilling Equipment Emission
 - Re-drilling Fugitive Emission
- Non-Stationary Source Operational Emissions
 - Trip Generation Day to Day Operations
 - Tanker Trips and Mileage
 - Operating Mobile Emissions Excluding Tankers
 - Operating Tankers Emissions
 - Operations and Maintenance Emissions
 - Operational Fugitive Dust Emissions
- Stationary Source Operational Emissions
 - Stationary Source Emissions Summary
 - Emergency Generator Emissions
 - Flare Emissions
 - Equipment Component Leaks Fugitive Emissions
 - Equipment Component Counts
 - Truck Loading Rack Emissions
 - Steam Generators Emissions
 - Storage Tanks Emissions
- Electrical Generation Greenhouse Gas Emissions
 - Operating Indirect Electrical Generation Emissions
- Emission Summaries
 - Construction Emissions Summaries
 - Operational Emissions Summaries

B. California Emissions Estimator Model v.2013.2.2 Output Files

C. Santa Barbara County Air Pollution Control District's HRA

- Tables
 - Table 4.1: CEQA-Only Modeling Sources
 - Table 9.1: Cancer Risk at PMI, MEIR and MEIW Receptors
 - Table 9.2: Chronic Non-Cancer Risk at PMI, MEIR and MEIW Receptors
 - Table 9.3: Chronic 8-Hour Non-Cancer Risk at PMI and MEIW Receptors
 - Table 9.4: Acute Non-Cancer Risk at PMI, MEIR and MEIW Receptors
 - Table 10.1-1: Risk Driver for Cancer Risk at MEIR – Receptor No. 3751
 - Table 10.1-2: Risk Driver for Cancer Risk at MEIW – Receptor No. 1828
 - Table 10.1-3: Risk Driver for Cancer Risk at PMI – Receptor No. 4873
 - Table 10.2-1: Risk Driver Chronic Non-Cancer Risk at MEIR – Receptor No. 3751
 - Table 10.2-2: Risk Driver Chronic Non-Cancer Risk at MEIW – Receptor No. 1828
 - Table 10.2-3: Risk Driver Chronic Non-Cancer Risk at PMI – Receptor No. 4873
 - Table 10.3-1: Risk Driver 8-Hr Chronic Non-Cancer Risk at MEIW – Receptor No. 1828
 - Table 10.3-2: Risk Driver 8-Hr Chronic Non-Cancer Risk at PMI – Receptor No. 4873
 - Table 10.4-1: Risk Driver Acute Non-Cancer Risk at MEIR – Receptor No. 1873
 - Table 10.4-2: Risk Driver Acute Non-Cancer Risk at MEIW – Receptor No. 1818
 - Table 10.4-3: Risk Driver Acute Non-Cancer Risk at PMI – Receptor No. 4910
- Attachments
 - A1 – Residential Cancer Risk Isopleth: Entire Stationary Source View
 - A2 – Residential Cancer Risk Isopleth: Magnified View
 - B1 – Residential Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
 - B2 – Residential Chronic Non-Cancer Risk Isopleth: Magnified View of PMI and MEIR
 - B3 – Residential Chronic Non-Cancer Risk Isopleth: Magnified View of 1.0 Hazard Index Isopleth
 - C1 – Worker Cancer Risk Isopleth: Entire Stationary Source View
 - C2 – Worker Cancer Risk Isopleth: Magnified View
 - D1 – Worker Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
 - D2 – Worker Chronic Non-Cancer Risk Isopleth: Magnified View
 - E1 – Worker 8-Hour Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
 - E2 – Worker 8-Hour Chronic Non-Cancer Risk Isopleth: Magnified View
 - F – Acute Non-Cancer Risk Isopleth
- Toxic Emissions and Modeling Files (Electronic Zipped)
- Figures (Not part of the Santa Barbara Health Risk Assessment)
 - Buildings (Figure C-1)

- Emission Sources (Figures C-2 and C-3)
- Project Boundary Coordinate Points (Figure C-4)
- D. Santa Barbara County Air Pollution Control District's Ambient Air Quality Analysis
 - Tables
 - Table 4.1: CEQA-Only Modeling Sources
 - Table 9.1: AAQS Modeling Results
 - Emission Calculations and Modeling Files (Electronic Zipped)
- E. Equipment Specifications
 - Detailed Equipment List
 - Steam Generator Specification
 - Flare Specification
 - Flow Meter Specification
 - Emergency Generator Specification
 - Miscellaneous Equipment
 - Fluid Throughput Measurement
 - SG Fuel Use Measurement
 - Sulfatreat® Monitoring and Media Replacement procedures
 - Gas Flaring Scenarios
- F. Material Safety Data Sheets
 - Amerlock 400
 - Amershield
 - Hempadur 15570
 - Hempadur 17369
 - Surftreat
 - Interseal 670

EXECUTIVE SUMMARY

Insight Environmental Consultants, Inc. has completed an Air Quality Impact Analysis for the proposed Aera Energy LLC (Aera) East Cat Canyon Oil Field Redevelopment Project (Project). The proposed Project will consist of re-establishing oil production within the Brooks formation of the East Area of the State Designated Cat Canyon Oil Field. The Project site is located within the Solomon Hills northeast of the Gato Ridge mountain ranges within East Cat Canyon; it will be approximately ten miles southeast of the communities of Santa Maria and Orcutt located in northern Santa Barbara County, California.

Criteria pollutant emissions from reactive organic gases, carbon monoxide, nitrogen dioxide, sulfur dioxide, and suspended particulate matter up to 10 microns in diameter and particulate matter up to 2.5 microns in diameter from the proposed Project development will occur from re-establishing oil production in an existing oil field. Construction and drilling will occur in several phases between the years 2017 and 2049. Operational emissions will occur from employee mobile transportation emissions, stationary source equipment, and incidental activities including the provision of utilities and services. Greenhouse gas emissions will occur from construction and operational activities. Emissions were estimated using the California Emissions Estimator Model version 2013.2.2 (California Air Pollution Control Officers Association 2013), EMFAC2014 (California Air Resources Board 2011), and AP-42 Fifth Edition, Compilation of Air Pollutant Emission Factors (U.S. Environmental Protection Agency (Environmental Protection Agency) 1995 as amended). Project-related emissions were evaluated for compliance with National Ambient Air Quality Standards and California Ambient Air Quality Standards for the six criteria pollutants.

Evaluation of the Project's emissions determined that the Project will have a significant impact on the Santa Barbara County and South Central Coast Air Basin from unmitigated construction, operations and greenhouse gas related emissions, as shown in **Tables 5-2, 5-4 and 7-1** of this analysis.

The cumulative analysis considers a list of currently planned and pending projects in the Santa Maria Valley, Orcutt, and Los Alamos areas. Cumulative impacts were also evaluated and support a finding that the Project's contribution will be cumulatively considerable because the proposed Project's unmitigated emissions increment does exceed significance thresholds.

1.0 INTRODUCTION

This Air Quality Impact Analysis was prepared pursuant to the Santa Barbara County Air Pollution Control District's Environmental Review Guidelines (Santa Barbara County Air Pollution Control District 1995, revised 2000), Santa Barbara County Air Pollution Control District's Scope and Content of Air Quality Sections in Environmental Documents (2014), the Santa Barbara County's Environmental Thresholds and Guidelines Manual (2008), the State of California Environmental Quality Act (California Environmental Quality Act) (Public Resources Code 21000 to 21177) and California Environmental Quality Act Guidelines (California Code of Regulations Title 14, Division 6, Chapter 3, Sections 15000 – 15387).

This Air Quality Impact Analysis provides: a general Project description; a discussion of applicable environmental thresholds; the regulatory and environmental setting related to air quality in the Project area; identification of air quality impacts of the proposed Project, Project alternatives, cumulative impacts; and recommended mitigation measures to reduce air quality impacts.

2.0 GENERAL PROJECT DESCRIPTION

The East Cat Canyon Oil Field Redevelopment Project will re-establish oil production in an existing oil field by implementing a thermal enhanced oil recovery process that is technically, economically, and environmentally feasible for oil recovery. Project plans include construction and restoration of well pads, construction and restoration of field access roads, and drilling of 296 wells including oil/gas production wells, steam injection wells, observation wells, water production wells, water injection wells, and fresh groundwater wells.

New processing facilities and field systems will be constructed. Processing facilities will include: 1) a production group station for bulk separation of produced gas and liquids, 2) a central processing facility for oil cleaning, water cleaning, water softening, oil storage, and oil sales, and 3) a steam generation site (up to six once through steam generators rated at 85 million British thermal units per hour each) for production of saturated steam to be used for thermal enhanced oil recovery. An additional 62.5 million British thermal units per hour steam generator will be used to generate steam from the Project's produced gas. No fresh water will be used to generate steam; only non-potable water will be used.

Field systems will include 1) a production gathering network, 2) a steam distribution network and 3) electrical power distribution and supervisory control and data acquisition networks. Project infrastructure will also include an office building, a multipurpose building, a warehouse and maintenance building, and a facility control building. A fresh water system with a 3,000 barrel tank and water distribution pipelines is also planned for utility purposes including fire protection, lavatories, showers, equipment cleaning, dust control, and minor landscape irrigation.

The Project has been designed to minimize grading and land disturbance by maximizing the use of existing roads, well pads, cleared areas, and contours wherever possible. Out of the approximate total 2,107.8 acre Project site, approximately 1,808 acres, or 85.8 percent will not be graded. Approximately 14.2 percent of the Project site will be graded. Earthwork volumes

will be balanced across the Project site in order to minimize the need for import or export of significant amounts of soil.

The primary Project site entrance is located at 6516 Cat Canyon Road. Vehicles and equipment entering the Project site travel across Cat Canyon Creek via an existing culvert crossing located just outside of the Aera Energy LLC property boundary. As proposed, the Project will utilize the existing crossing during the initial Project construction, while concurrently constructing a new Project site entrance located approximately 300 feet north (upstream) of the existing entrance. The Project will also include construction of a secondary access located along Long Canyon Road, on the eastern boundary of the Project site along with two smaller east side entrances from Long Canyon Road, which will be constructed to provide adequate access new well pads. Project site entrances will be connected via a primary site access road, which will be graded and paved concurrently with the Project site entrance construction activities.

The Project will be implemented in phases. Construction is scheduled to begin in 2017. Construction and drilling will occur in two phases through 2049; Phase I and Phase II. Phase I will include the construction of the production group station, central processing facility, steam generation site, fresh water distribution system, office building, main roadways and a beneficial reuse facility for soil and sand. Four of the seven steam generators will be installed during this Phase. Some of the Project's well pads and wells will be restored/developed during Phase I, along with the roadways, electrical distribution lines, and gathering and distribution pipelines to support those wells. Phase I activities will last approximately four years.

During Phase II, the remaining well pads will be restored/developed, the remaining wells will be drilled, along with associated roadways, electrical distribution lines, and gathering and distribution pipelines. Phase II will also expand the processing facility capacities, and add three additional steam generators. Phase II construction will start approximately three years after Phase I completion, and is expected to take up to two years. Phase II well drilling, along with the construction of roadways, electrical distribution lines, and gathering and distribution pipelines to support those wells, is planned to take place over a period of ten years. Production from the Project is expected to continue for more than 30 years.

The Project site is located within the Solomon Hills northeast of the Gato Ridge mountain ranges within East Cat Canyon; approximately ten miles southeast of the communities of Santa Maria and Orcutt located in northern Santa Barbara County, California. The current main entrance is located at 6516 Cat Canyon Road, south of Sisquoc, California. The Project site is located within the South Central Coast Air Basin and within the jurisdiction of the Santa Barbara County Air Pollution Control District. **Figure 2-1** provides the Project and regional location of the proposed Project.

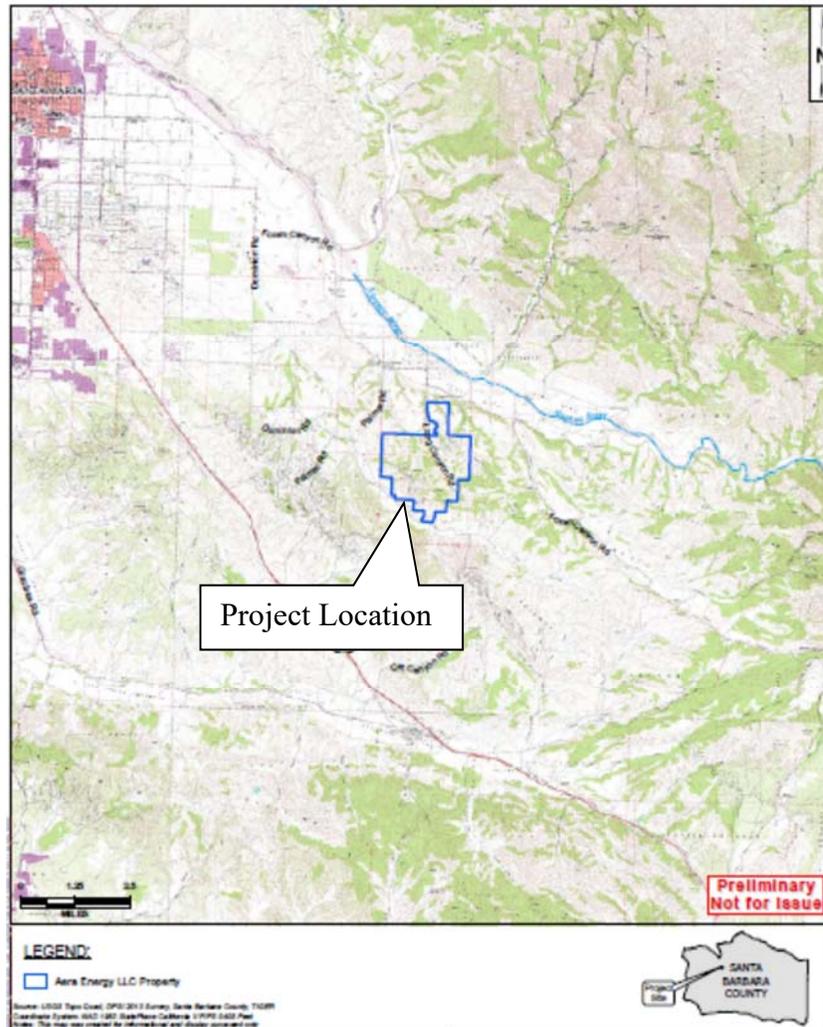


Figure 2-1 - Project and Regional Location

The proposed Project area will consist of approximately 2,100 acres of Assessor Parcel Numbers 101-040-005, 101-040-006, 101-040-011, 101-040-012, 101-040-013, 101-040-014, 101-040-019, 101-040-020, 101-050-013, 101-050-014, 101-050-042, 101-070-007, and 129-210-017.

Figure 2-2 provides the Project site's aerial perspective. The Project site is surrounded by several active oil fields, dry land grazing lands, and approximately 30 rural residences located within 0.5 miles from the southern, eastern, and northern borders of the Project site. Historical land use at the Project site includes oil production dating back to 1888, along with onsite structures and facilities for oil production and dry land grazing. The development Project activity will be focused predominantly on the southwest portion of the property, where the greater density of existing roads, well pads and previous oil production facility footprint already exists.

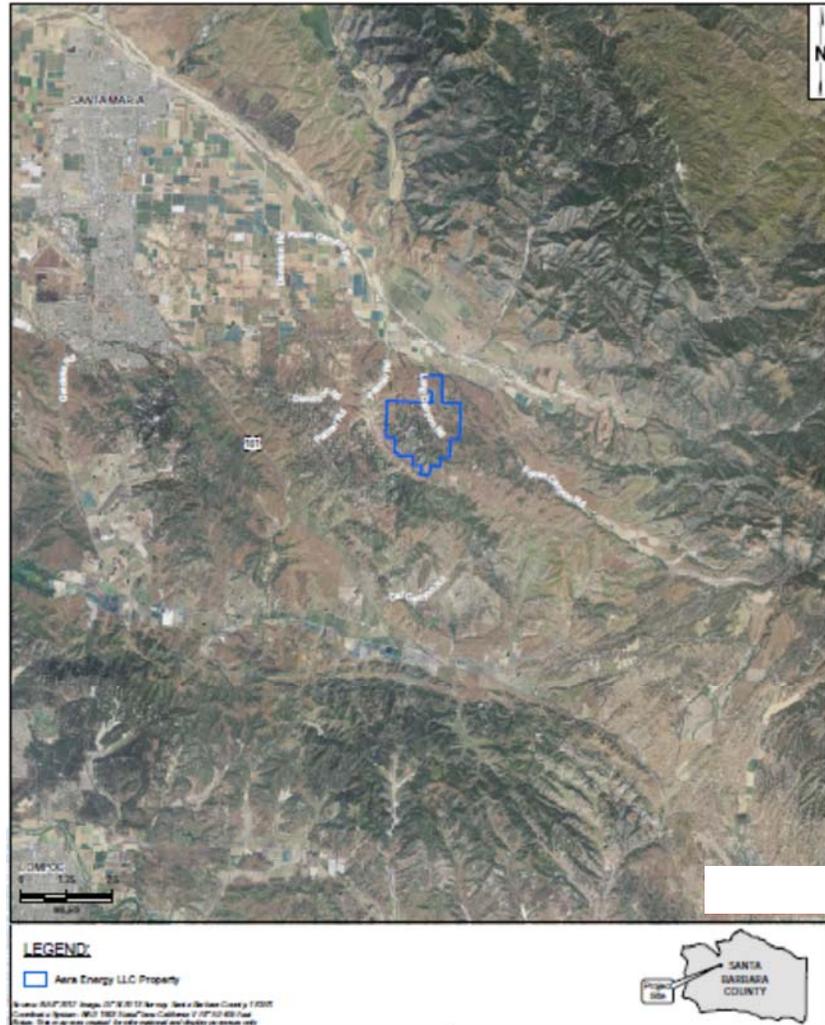


Figure 2-2 - Project Site Aerial

3.0 SANTA BARBARA COUNTY ENVIRONMENTAL THRESHOLDS

OPERATIONS THRESHOLDS FOR CRITERIA POLLUTANTS

The thresholds used to determine whether or not there is the potential for a significant impact are from Santa Barbara County Environmental Thresholds and Guidelines Manual (Santa Barbara County 2008). A proposed Project would have a less than significant air quality impact on the environment if operation of the Project will:

- Emit (from all Project sources, mobile and stationary) less than the daily trigger for offsets set in the Air Pollution Control District's New Source Review Rule 802 (55 pounds per day for reactive organic compounds and nitrogen oxides and 80 pounds per day for particulate matter);
- Emit less than 25 pounds per day of nitrogen oxides or reactive organic compounds from motor vehicle trips only;

- Not cause or contribute to a violation of any National Ambient Air Quality Standards or California Ambient Air Quality Standards (except ozone);
- Not allow land uses that create objectionable odors or expose sensitive receptors to objectionable odors;
- Not exceed the Air Pollution Control District’s health risk public notification thresholds adopted by the Air Pollution Control District Board for air toxics (i.e., one in million cancer risk and an acute and chronic hazard indices of one); and
- Be consistent with the adopted Federal and State air quality plans.

The State of California Environmental Quality Act Guideline §15355 defines cumulative impacts as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impact.” The individual effects may be changes resulting from a single project and more than one project (California Environmental Quality Act Guidelines §15355(a).) Cumulative impacts may result from individually minor but collectively significant projects taking place over a period of time. (California Environmental Quality Act Guidelines §15355(b)).

CONSTRUCTION THRESHOLDS FOR CRITERIA POLLUTANTS

Emissions from construction activities are normally short-term. Currently, neither the County nor the Santa Barbara County Air Pollution Control District have daily or quarterly quantifiable emission thresholds established for short-term construction emissions. The Final 2013 Clean Air Plan (SBCAPCD 2015) and the Santa Barbara County Environmental Thresholds and Guidelines Manual (SBC 2008) require that PM₁₀ impacts from construction dust emissions be discussed in the Air Quality Impact Analysis and that standard mitigation measures be implemented (e.g., watering). The Santa Barbara County Air Pollution Control District’s *Scope and Content of Air Quality Sections in Environmental Documents* states “Although quantitative thresholds of significance are not currently in place for short-term emissions, California Environmental Quality Act requires that short-term impacts, such as exhaust emissions from construction equipment and fugitive dust generation during grading, be discussed in the environmental document”. However, the Santa Barbara County Air Pollution Control District requires construction projects that emit more than 25 tons per year to obtain emission offsets under Rule 804 and would consider these emissions to be significant under California Environmental Quality Act. Santa Barbara County Air Pollution Control District Rule 202 (related to permits and offset requirements and exemptions), Section D.16, requires that:

“Notwithstanding any exemption in these rules and regulations (Rule 202), if the combined emissions from all construction equipment used to construct a stationary source which requires an Authority to Construct have a projected actual in excess of 25 tons of any pollutant, except carbon monoxide, in a 12 month period, the owner of the stationary source shall provide offsets...”

GREENHOUSE GAS EMISSION THRESHOLDS

The California Natural Resources Agency amended the Guidelines for Implementation of the California Environmental Quality Act in 2009, placing requirements on California Environmental Quality Act Lead Agencies about the treatment of greenhouse gas emissions in environmental documents. Among other things, these amendments established that lead agencies must "...make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of greenhouse gas emissions resulting from a project". These amendments further obligate the lead agency to consider if the estimated amount of greenhouse emissions from a proposed project exceeds a threshold of significance that the lead agency determines to apply to the project, and consider the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.

The Santa Barbara County Air Pollution Control District recently established a greenhouse gas significance threshold. According to the Santa Barbara County Air Pollution Control District's revised Environmental Review Guidelines, a proposed stationary source project will not have a significant greenhouse gas impact, if operation of the project will:

- Emit less than the screening significance level of 10,000 metric tons per year carbon dioxide equivalent, or
- Show compliance with an approved greenhouse gas emission reduction plan or greenhouse gas mitigation program which avoids or substantially reduces greenhouse gas emissions (sources subject to the Assembly Bill 32 Cap-and-Trade requirements pursuant to Title 17, Article 5 (California Cap on Greenhouse Gas Emissions and Market-based Compliance Mechanisms) would meet the criteria), or
- Show consistency with the Assembly Bill 32 Scoping Plan greenhouse gas emission reduction goals by reducing project emissions 15.3 percent below Business As Usual.

The County of Santa Barbara also established a greenhouse gas significance threshold in May of 2015. According to an approved amendment to the County of Santa Barbara's Environmental Thresholds and Guidelines Manual, all industrial and stationary source projects would be subject to a bright-line threshold of 1,000 metric tons of carbon dioxide equivalent per year to determine if greenhouse gas emissions constitute a significant cumulative impact.

Projects exceeding the 1,000 metric tons of carbon dioxide equivalent per year significance threshold would be required to reduce their greenhouse gas emissions to the applicable threshold, where feasible, through onsite reductions and offsite reduction programs approved by the County of Santa Barbara. This county threshold will be used as the threshold to determine significance for this Project.

4.0 REGULATORY AND ENVIRONMENTAL SETTING

Regulatory Setting

Federal, State, and local agencies have established air quality standards and regulations that govern the proposed Project. A summary is provided below.

FEDERAL REGULATIONS

The Federal Clean Air Act of 1970 directs the attainment and maintenance of the National Ambient Air Quality Standards. The 1990 Amendments to this Act addressed air pollutant emissions that affect local, regional, and global air quality. The main elements of the 1990 Clean Air Act Amendments are summarized below:

- Title I, Attainment and maintenance of National Ambient Air Quality Standards;
- Title II, Motor vehicles and fuel reformulation;
- Title III, Hazardous air pollutants;
- Title IV, Acid deposition;
- Title V, Facility operating permits (describes requirements for Part 70 permits);
- Title VI, Stratospheric ozone protection; and
- Title VII, Enforcement.

The U.S. Environmental Protection Agency is responsible for implementing the Federal Clean Air Act and establishing the National Ambient Air Quality Standards for the six “Criteria Pollutants”: carbon monoxide, lead, nitrogen dioxide, sulfur dioxide, particulates, and ozone.

STATE REGULATIONS

California Air Resources Board.

The California Air Resources Board has jurisdiction over all air pollutant sources in the State and established the California Ambient Air Quality Standards. California Air Resources Board has delegated its authority for stationary sources to local air districts but has retained authority over emissions from mobile sources. Comparison of the criteria pollutant concentrations in ambient air to the California Ambient Air Quality Standards determines State attainment status for criteria pollutants in a given region. California Air Resources Board, in partnership with the local air quality management districts within California, has developed a pollutant monitoring network to aid attainment of California Ambient Air Quality Standards. The network consists of numerous monitoring stations located throughout California that monitor and report the ambient concentrations of criteria and related pollutants concentrations in air.

California Clean Air Act (California Health and Safety Code, Division 26).

The California Clean Air Act (California Health and Safety Code, Division 26) went into effect on January 1, 1989, and was amended in 1992. The California Clean Air Act mandates achieving the health-based California Ambient Air Quality Standards at the earliest practical

date.

Air Toxics “Hot Spots” Information and Assessment Act of 1987 – AB2588 (California Health and Safety Code, Division 26, Part 6).

The Hot Spots Act requires an inventory of air toxics emissions from individual facilities, an assessment of health risk, and notification of potential significant health risk.

California Health and Safety Code Sections 25531–25543, The Calderon Bill (SB 1889).

Sections 25531–25543 of the California Health and Safety Code set forth changes in the following four areas: 1) provide guidelines to identify a more realistic health risk; 2) require high-risk facilities to submit an air toxic emission reduction plan; 3) hold air pollution control districts accountable for ensuring that the plans will achieve their objectives; and 4) require high-risk facilities to achieve their planned emission reductions.

California Diesel Fuel Regulations

With the California Diesel Fuel Regulations, the California Air Resources Board set sulfur limitations for diesel fuel sold in California for use in on-road and off-road motor vehicles. Under this rule, diesel fuel used in motor vehicles was limited to 500-parts per million sulfur since beginning in 1993. This sulfur limit was later reduced to 15-parts per million, effective September 1, 2006.

LOCAL

Local Air Pollution Control Districts in California have jurisdiction over stationary sources in their respective areas and must adopt plans and regulations necessary to demonstrate attainment of Federal and State air quality standards. As directed by the Federal and State Clean Air Acts, local air districts are required to prepare plans with strategies for attaining and maintaining State and Federal ozone standards.

In the Project area, air quality rules are promulgated by the Santa Barbara County Air Pollution Control District. With few exceptions (including particulate emissions from mobile sources), most of the Santa Barbara County Air Pollution Control District Rules apply to stationary sources only, since California Air Resources Board retains authority for mobile air emissions sources. In order to ultimately achieve the air quality standards, the rules limit emissions and permissible impacts from the proposed Project. Some rules also specify emission controls and control technologies for each type of emitting source. The rules also include requirements for obtaining an Authority to Construct permit and a Permit to Operate.

Santa Barbara County Air Pollution Control District

The Santa Barbara County Air Pollution Control District has jurisdiction over air quality attainment in the Santa Barbara County portion of the South Central Coast Air Basin. All aspects of the proposed Project occurring in Santa Barbara County must obtain a Santa Barbara County Air Pollution Control District permit, if applicable. The Santa Barbara County Air

Pollution Control District also has jurisdiction over Outer Continental Shelf sources located within 25 miles (40 kilometers) of the seaward boundaries of the State of California (Rule 903). Increases in emissions of any non-attainment pollutant or its pre-cursor from a new or modified project that exceed the thresholds which have been identified in the Santa Barbara County Air Pollution Control District Regulation VIII, are required to be mitigated. Rules which apply to Onshore Petroleum Extraction and Processing are summarized below.

Rule 201, Permits Required – Specifies the permits required for construction or operation of equipment that emits air contaminants.

Rule 301, Circumvention – This rule prohibits the concealment of any activity that would otherwise constitute a violation of Division 26 (Air Resources) of the California Health and Safety Code and the Santa Barbara County Air Pollution Control District rules and regulations.

Rule 302, Visible Emissions – limits discharge of visible emissions designated as No. 1 on the Ringelmann Chart to no more than three minutes in any hour.

Rule 303, Nuisance – No discharges which cause injury, detriment, nuisance or annoyance are allowed.

Rule 304 (N), Particulate Matter, Northern Zone – No discharges or any particulate matter in excess of 0.3 grain per cubic foot of gas at standard conditions are allowed.

Rule 305 (S), Particulate Matter Concentration, Southern Zone - No discharges or any particulate matter in excess of the concentration shown in Table 305 (a).

Rule 309, Specific Contaminants – No discharge of sulfur in excess of 0.2 percent by volume are allowed.

Rule 310 – Odorous Sulfates – These rules prohibit air emissions that cause a nuisance, e.g., odorous sulfates emitted near odor-sensitive receptors.

Rule 311, Sulfur Content of Fuels – Limits burning of gaseous fuel containing high concentrations of sulfur.

Rule 317, Organic Solvents – Limits discharge of organic solvent materials into atmosphere.

Rule 324, Disposal and Evaporation of Solvents – Limits disposal of photochemically reactive solvents.

Rule 325, Crude Oil Production and Separation – Places requirements on crude oil storage and handling.

Rule 326, Storage of Reactive Organic Compound Liquids - Places requirements on crude oil and reactive organic compound liquids storage and handling.

Rule 331, Fugitive Emissions Inspection and Maintenance – Sets limits and rules on liquid or gaseous hydrocarbon leaks.

Rule 342, Control of Oxides of Nitrogen – Limits nitrogen oxide emissions from boilers, steam generators and process heaters.

Rule 343, Petroleum Storage Tank Degassing – Places limits on tank degassing.

Rule 344, Petroleum Sumps, Pits, and Well Cellars – Bans primary sumps and limits pits and post-primary sumps.

Rule 359, Flares and Thermal Oxidizers – Places limits on flares and thermal oxidizers.

Rule 360, Emissions of Oxides of Nitrogen – Limits nitrogen oxides from Large Water Heaters and Small Boilers.

Rule 361, Small Boilers, Steam Generators and Process Heaters – Limits emissions from boiler, steam generator and process heater.

Rule 370, Potential to Emit – Limitations for Part 70 Sources – Specifies actual emission level criteria below which Part 70 sources are exempt from Part 70 permit requirements.

Regulation XIII – Defines criteria for Part 70 source applicability, and permit content and requirements for Part 70 sources.

Rule 802, Non-Attainment Review – For new or modified emission sources, this rule specifies emission limits that would trigger emission offsets (80 pounds/day for particulate matter of 10 microns, 55 pounds/day for any non-attainment pollutant and 150 pounds/day for carbon monoxide) or trigger Best Available Control Technology requirements (25 pounds/day for any non-attainment pollutant and 150 pounds/day for carbon monoxide). Note that currently, the area is in non-attainment for ozone (with nitrogen oxides and reactive organic compounds as ozone precursors) and particulate matter of 10 microns (with sulfur oxides as a particulate precursor).

CRITERIA AIR POLLUTANT STANDARDS

Protection of the public health is maintained through the attainment and maintenance of standards for ambient concentrations of various criteria air pollutants in the atmosphere and the enforcement of emissions limits for individual stationary sources. The Federal Clean Air Act requires that the Environmental Protection Agency establish National Ambient Air Quality Standards to protect the health, safety, and welfare of the public. National Ambient Air Quality Standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter of 10 microns and particulate matter of less than 2.5 microns, and lead. California has also adopted California Ambient Air Quality Standards for these "criteria" air pollutants that are more stringent than the corresponding National Ambient Air Quality Standards along with standards for hydrogen sulfide, vinyl chloride (chloroethene) and visibility reducing particles. The Clean Air Act Amendments of 1977 required states to identify areas that were in non-attainment of the National Ambient Air Quality Standards and to develop State Implementation Plans containing strategies to bring these non-attainment areas into compliance. Current ambient air quality standards and the current designation/classification for both National Ambient Air Quality Standards and California Ambient Air Quality Standards are presented below.

Under the provisions of the Federal Clean Air Act, Santa Barbara County has been classified as non-attainment, attainment, unclassified/attainment or unclassified under the established National Ambient Air Quality Standards and California Ambient Air Quality Standards for various criteria pollutants. **Table 4-1** provides the National Ambient Air Quality Standards and California Ambient Air Quality Standards as well as Santa Barbara County's designation and classification based on the various criteria pollutants.

Table 4-1 - Federal and California Standards and Santa Barbara County Attainment Status

Pollutant	Averaging Time	Federal Standard	SBC Federal Attainment Status	State Standard	SBC State Attainment Status
Ozone	1-hour *	---	---	0.09 parts per million (180 µg/m ³)	Non-attainment
	8-hour**	0.075	Unclassified / Attainment	0.070 parts per million	Non-attainment
Particulate Matter (PM ₁₀)	Annual arithmetic mean	revoked	Attainment	20 µg/m ³	Non-Attainment
	24-hour	150 µg/m ³	Attainment	50 µg/m ³	Non-Attainment
Particulate Matter (PM _{2.5})	Annual arithmetic mean	12 µg/m ³	Unclassified / Attainment	12 µg/m ³	Unclassified
	24-hour	35 µg/m ³	Unclassified / Attainment	---	---
Carbon Monoxide	8-hour	9 parts per million (10 mg/m ³)	Attainment	9 parts per million (10 mg/m ³)	Attainment
	1-hour	35 parts per million (40 µg/m ³)	Attainment	20 parts per million (23 mg/m ³)	Attainment
Nitrogen Dioxide***	Annual Average	53 ppb	Attainment	0.03 parts per million	Attainment
	1-hour	100 ppb	Attainment	0.18 parts per million	Attainment
Sulfur Dioxide	Annual average	revoked	---	---	---
	24-hour	revoked	---	0.04 parts per million (105 µg/m ³)	Attainment
	1-hour	75 ppb	*	0.25 parts per million (655 µg/m ³)	Attainment
Sulfates	24-hour	---	---	25 µg/m ³	Attainment
Lead	Calendar quarter	1.5 µg/m ³	Attainment	---	---
	30 day average	---	---	1.5 µg/m ³	Attainment
	Rolling 3-month average	0.15 µg/m ³	Unclassified	---	---
Hydrogen Sulfide	1-hour	---	---	0.03 parts per million (42 µg/m ³)	Attainment
Vinyl Chloride (chloroethene)	24-hour	---	---	0.010 parts per million (46 µg/m ³)	---
Visibility Reducing Particles	8 hour (1000 to 1800 PST)	---	---	---	Attainment
Definitions:		mg/m ³ = milligrams per cubic meter		SBC = Santa Barbara County	
ppm = parts per million		µg/m ³ = micrograms per cubic meter			
ppb = parts per billion					
Notes:					
* 1-Hour ozone standard revoked effective June 15, 2005.					
** Environmental Protection Agency finalized the revised (2008) 8-hour ozone standard of 0.075 parts per million on March 27, 2008. The 1997 8-hour ozone standard of 0.08 parts per million has not been revoked. In the January 19, 2010 Federal Register, Environmental Protection Agency proposed to revise the 2008 ozone National Ambient Air Quality Standards of 0.075 parts per million to a National Ambient Air Quality Standards in the range of 0.060 to 0.070 parts per million. For more information, see www.epa.gov/groundlevelozone/					
***The State nitrogen dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hour standard to 0.18 parts per million and establish a new annual standard of 0.030 parts per million. On January 22, 2010, Environmental Protection Agency set a new 1-hour nitrogen dioxide standard of 100 parts per billion. They also retained the annual nitrogen dioxide standard of 53 parts per billion.					

Source: Santa Barbara County Air Pollution Control District 2014; California Air Resources Board 2014a

The California Air Resources Board operates an air quality monitoring network that provides information on average concentrations of those pollutants for which state or Federal agencies have established National Ambient Air Quality Standards and California Ambient Air Quality Standards. Information from the Project area monitoring stations is available from the California Air Resources Board (2014) and presented below under Environmental Setting.

GREENHOUSE GAS EMISSIONS REGULATIONS

Federal Greenhouse Gas Regulations

Clean Air Act

The Environmental Protection Agency is developing standards for regulating greenhouse gas emissions from mobile and stationary sources under the Clean Air Act, Section 202(a). Two initiatives are underway to address mobile sources: 1) In coordination with the National Highway Traffic Safety Administration, steps are being taken to enable a new generation of clean vehicles to reduce up to 3,100 million metric tons of carbon dioxide emissions; and 2) the implementation of a Renewable Fuel Standard program to reduce greenhouse gas emissions by up to 138 million metric tons of carbon dioxide emissions. Three initiatives are underway to address stationary sources: 1) Establish new carbon pollution standards for power plants; 2) Implement the 2010 Final Greenhouse Gas Tailoring Rule; and 3) implement the Prevention of Significant Deterioration permitting program to greenhouse gas. The Environmental Protection Agency also oversees an emissions reporting program for greenhouse gas from large emission sources.

State Greenhouse Gas Regulations and Programs

Assembly Bill 32

California's Assembly Bill 32 was signed into law by Governor Arnold Schwarzenegger on September 27, 2006. Assembly Bill 32 requires the state to reduce its global warming emissions to 1990 levels by the year 2020.

The Act authorizes the California Air Resources Board to adopt market-based compliance mechanisms including Cap-and-Trade, and allows a one-year extension of the targets under extraordinary circumstances. The regulatory steps laid out in Assembly Bill 32 require California Air Resources Board to: adopt early action measures to reduce greenhouse gases; establish a State-wide greenhouse gas emissions cap for 2020 based on 1990 emissions; adopt mandatory reporting rules for significant source of greenhouse gases; and adopt a scoping plan indicating how emission reductions will be achieved via regulations, market mechanisms and other actions; and adopt the regulations needed to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gases.

In June 2007, California Air Resources Board adopted three discrete early action measures which include the following: a low carbon fuel standard; reduction of HFC-134a emissions from non-professional servicing of motor vehicle air conditioning systems; and improved landfill methane capture. California Air Resources Board estimates that by 2020 the reductions from those three discrete early action measures would be approximately 13 million metric tons to 26 million metric tons carbon dioxide-equivalent (CAPCOA 2008).

California Air Resources Board: Scoping Plan

On December 11, 2008, the California Air Resources Board adopted the Scoping Plan as directed by Assembly Bill 32, and approved its first update on May 22, 2014 (California Air Resources Board 2008; updated 2014). The Scoping Plan proposes a set of actions designed to reduce overall greenhouse gas emissions in California. The actions include a Cap-and-Trade system, car standards, low carbon fuel standards, landfill gas control methods, energy efficiency, green buildings, renewable electricity standards, and refrigerant management programs.

The Scoping Plan provides an approach to reduce emissions to achieve the 2020 target, and to initiate the transformations required to achieve the 2050 target. The 2008 Scoping Plan indicates that a 29 percent reduction below the estimated “business as usual” levels would be necessary to return to 1990 levels by 2020. The 2011 supplement (Functional Equivalent Document) to the Scoping Plan emission inventory revisions indicated that a 16 percent reduction below the estimated “business as usual” levels would be necessary to return to 1990 levels by 2020. This revision was due to the slowing economy between 2008 and 2010.

California businesses are required to report their annual greenhouse gas emissions. This requirement is contained within sections 95100-95133 of Title 17, California Code of Regulations. It establishes who must report greenhouse gas emissions to the California Air Resources Board and sets forth the requirements for measuring, calculating, reporting and verifying those emissions. The rule specifies a reporting threshold of 10,000 metric tons of carbon dioxide.

California Climate Action Registry General Reporting Protocol

The California Climate Action Registry is a program of the Climate Action Reserve and serves as a voluntary greenhouse gas registry. The California Climate Action Registry was formed in 2001 when a group of chief executive officers, who were investing in energy efficiency projects that reduced their organizations’ greenhouse gas emissions, asked the state to create a place to accurately report their emissions history. The California Climate Action Registry publishes a General Reporting Protocol, which provides the principles, approach, methodology, and procedures to estimate such emissions.

California Air Resources Board Mandatory Reporting Regulation

The Air Resources Board approved a mandatory reporting regulation in December 2007, which became effective January 2009 (which appears at sections 95100-95133 of Title 17, California Code of Regulations), which required the mandatory reporting of greenhouse gas emissions for specific industries emitting more than 10,000 metric tons of carbon dioxide equivalent per year.

California Air Resources Board Cap-and-Trade Regulation

An element of the Assembly Bill 32 Scoping Plan to reduce greenhouse gas is a Cap-and-Trade system applicable to specific industries that emit more than 25,000 metric tons of carbon dioxide equivalent per year. The program places an overall cap or limit on greenhouse gas emissions. Industries subject to the Cap-and-Trade systems then must lower emissions by engaging in the Cap-and-Trade system. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 emissions from stationary sources. Beginning

in 2013, the petroleum and natural gas systems sector stationary and related combustion, process vents, and flare emissions were subject to cap and trade if the total emissions from these sources at any one facility exceeded 25,000 metric tons of carbon dioxide equivalent per year. Starting in 2015, suppliers of Natural Gas and transportation fuels will be subject to Cap-and-Trade for combustion emissions from natural gas deliveries made to non-covered entities or used for transportation fuels.

The Process for Analyzing Greenhouse Gas Emission related to CEQA:

Senate Bill 97 – California Environmental Quality Act: Greenhouse Gas Emissions

In August 2007, Governor Schwarzenegger signed into law Senate Bill 97 – California Environmental Quality Act: Greenhouse Gas Emissions stating, “This bill advances a coordinated policy for reducing greenhouse gas emissions by directing the Office of Planning and Research and the Resources Agency to develop California Environmental Quality Act guidelines on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions.”

Specifically, Senate Bill 97 required the Office of Planning and Research, by July 1, 2009, to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions, as required by California Environmental Quality Act, including, but not limited to, effects associated with transportation or energy consumption. Office of Planning and Research would be required to periodically update the guidelines to incorporate new information or criteria established by the California Air Resources Board pursuant to the California Global Warming Solutions Act of 2006. Senate Bill 97 also identifies a limited number of types of projects that would be exempt under California Environmental Quality Act from analyzing greenhouse gas emissions.

On January 7, 2009, the Office of Planning and Research issued its draft California Environmental Quality Act guidelines revisions pursuant to Senate Bill 97. On March 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010.

Consistent with Senate Bill 97, on March 18, 2010, the California Environmental Quality Act Guidelines were amended to include references to greenhouse gas emissions. The amendments offer guidance regarding the steps lead agencies should take to address climate change in their California Environmental Quality Act documents. According to office of planning and research, lead agencies should determine whether greenhouse gas may be generated by a Proposed Project, and if so, quantify or estimate the greenhouse gas emissions by type and source. Second, the lead agency must assess whether those emissions are cumulatively significant. When assessing whether a Project’s effects on climate change are cumulatively considerable, even though its greenhouse gas contribution may be individually limited, the lead agency must consider the impact of the Project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the greenhouse gas emissions from the Proposed Project are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions. The Amendments do not identify a threshold of significance for greenhouse gas emissions, nor do

they prescribe assessment methodologies or specific mitigation measures. The Preliminary Amendments maintain California Environmental Quality Act discretion for lead agencies to establish thresholds of significance based on individual circumstances.

The guidelines developed by the Office of Planning and Research provide the lead agency with discretion in determining what methodology is used in assessing the impacts of greenhouse gas emissions in the context of a particular Project. This guidance is provided because the methodology for assessing greenhouse gas emissions is expected to evolve over time. The Office of Planning and Research guidance also states that the lead agency can rely on qualitative or other performance based standards for estimating the significance of greenhouse gas emissions.

Environmental Setting

CLIMATE AND METEOROLOGY

Santa Barbara County and the South Central Coast Air Basin has a Mediterranean climate characterized by mild winters and warm, dry summers. The influence of the Pacific Ocean causes mild temperatures year-round along the coast, while inland areas experience a wider range of temperatures. The wind blows predominantly from the west and northwest and to a lesser extent from the east and southeast. Wind speeds average five miles per hour with occasional gusts above 30 miles per hour.

Table 4-2 summarizes the 2013 climatic data collected at the Santa Maria weather station, the closest recording station to the Project area providing data to the public.

Table 4-2 - 2013 Climatic Data for the Project Area

Parameter	Santa Maria Data
Mean Daily Temperature range	40-77, degrees Fahrenheit
Range Maximum Daily Temperature	52-94, degrees Fahrenheit
Range Minimum Daily Temperature	25-62, degrees Fahrenheit
Average Annual Precipitation	3.03 inches
Peak Winds, miles per hour	37-106 (gust)

Source: Wunderground History for Santa Maria, 2013; California Air Resources Board 2014a

EXISTING AIR QUALITY

For the purposes of background data and this air quality assessment, this analysis relied on data collected in the last three years for the California Air Resources Board monitoring stations that are located in the closest proximity to the proposed Project site. **Table 4-3** provides the background concentrations for ozone, particulate matter of 10 microns, particulate matter of less than 2.5 microns, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead as of August 2015. Information is provided for the Santa Maria monitoring station at 906 S. Broadway for 2012 through 2014. No data is available for hydrogen sulfide, Vinyl Chloride or other toxic air contaminants in Santa Barbara County.

Table 4-3 - Existing Air Quality Monitoring Data in Project Area

Pollutant and Monitoring Station Location	Maximum Concentration			Days Exceeding Standard		
	2012	2013	2014	2012	2013	2014
O₃ – 1-hour CAAQS (0.09 ppm)						
Santa Maria – 906 S. Broadway	0.057	0.064	0.074	0	0	0
O₃ – 8-hour CAAQS (0.07 ppm)						
Santa Maria – 906 S. Broadway	0.052	0.060	0.068	0	0	0
O₃ – 8-hour NAAQS (0.075 ppm)						
Santa Maria – 906 S. Broadway	0.051	0.060	0.068	0	0	0
PM₁₀ – 24-hour CAAQS (50 µg/m³)						
Santa Maria – 906 S. Broadway	72.0	109.3	74.4	10	15	5
PM₁₀ – 24-hour NAAQS (150 µg/m³)						
Santa Maria – 906 S. Broadway	*	107.0	72.6	*	0	0
PM_{2.5} - 24-hour NAAQS (35 µg/m³)						
Santa Maria – 906 S. Broadway	32.0	20.4	17.6	0	0	0
CO - 8-Hour CAAQS and NAAQS (9.0 ppm)						
Santa Maria – 906 S. Broadway	1.11	*	*	0	0	0
NO₂ - 1-Hour CAAQS (0.18 ppm)						
Santa Maria – 906 S. Broadway	0.047	0.042	0.048	0	0	0
NO₂ - 1-Hour NAAQS (0.10 ppm)						
Santa Maria – 906 S. Broadway	0.0472	0.0426	0.0482	0	0	0
SO₂ – 24-hour Concentration - CAAQS (0.04 ppm) and NAAQS (0.14 ppm)						
Lompoc – H Street	0.002	0.002	*	*	*	*
Definitions:						
ppm= parts per million			PM ₁₀ = particulate matter up to 10 micron in diameter			
NAAQS = National Ambient Air Quality Standards			PM _{2.5} = particulate matter up to 2.5 micron in diameter			
CAAQA = California Ambient Air Quality Standards			CO = Carbon Monoxide			
O ₃ = Ozone			NO ₂ = Nitrogen Dioxide			
			SO ₂ = Sulfur Dioxide			
Notes:						
* There was insufficient (or no) data available to determine the value.						

Source: California Air Resources Board 2015

The following is a description of criteria pollutants, typical sources and health effects and the recently documented pollutant levels in the Project vicinity.

Ozone

Ozone is commonly known as smog. It is created in a photochemical process by emissions from nitrogen oxides and volatile organic compounds. High levels of ozone can cause eye irritation and impair respiratory functions in humans. People with lung disease, children, older adults, and people who are active outdoors may be particularly sensitive to ozone. High levels of ozone can also affect plants and materials.

Significant ozone generation requires about one to three hours in a stable atmosphere with precursor pollutants and strong sunlight. For this reason, the months of April through October generally comprise the "ozone season." Ozone is a regional pollutant because ozone precursors (nitrogen oxides and volatile organic compounds) are transported and diffused by wind concurrently with the reaction process. The data contained in **Table 4-3** shows that for the 2012 through 2014 period, the Project area has not exceeded the State 1-hour average ambient ozone standard or the Federal and State 8-hour average ambient ozone standards.

Suspended Particulate Matter

Suspended Particulate Matter pollution consists of airborne particles resulting from many kinds of sources, including industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities including wind-raised dust and ocean spray. The largest sources of suspended particulate matter in Santa Barbara County are vehicle movements over paved and unpaved roads, demolition and construction activities, farming/cattle grazing operations, and unplanned fires.

Both state and federal air quality standards exist for suspended particulate matter smaller than 10 microns, which are referred to as “PM₁₀”. After studies showed that the smaller-diameter suspended particulates represented a greater health hazard, the Environmental Protection Agency and the State of California established additional ambient air quality standards for particulate matter of less than 2.5 microns, known as “PM_{2.5}”.

Particulate matter up to 10 microns in diameter and particulate matter of less than 2.5 microns are considered regional pollutants in Santa Barbara County with elevated levels typically occurring over a wide geographic area. Concentrations tend to be highest in the winter, during periods of high atmospheric stability and low wind speed. In the respiratory tract, very small particles of certain substances may produce injury by themselves, or may contain absorbed gases that are injurious. Particulates of aerosol size suspended in the air can both scatter and absorb sunlight, producing haze and reducing visibility. They can also damage materials.

The Project area is classified as nonattainment under the California ambient air quality standards for particulate matter up to 10 microns in diameter and as attainment under the National ambient air quality standards for particulate matter up to 10 microns in diameter and particulate matter of less than 2.5 microns.

Table 4-3 shows that particulate matter up to 10 microns in diameter levels at the Santa Maria monitoring stations exceeded the California ambient air quality standard for particulate matter up to 10 microns in diameter over the three-year period of 2012 through 2014, but did not exceed the national ambient air quality standard for particulate matter up to 10 microns in diameter and particulate matter of less than 2.5 microns.

Carbon Monoxide

Ambient carbon monoxide concentrations normally correspond closely to the spatial and temporal distributions of vehicular traffic. Relatively high concentrations of carbon monoxide would be expected along heavily traveled roads and near busy intersections. Wind speed and atmospheric mixing also influence carbon monoxide concentrations; however, under inversion conditions prevalent in the South Central Coast Air Basin, carbon monoxide concentrations may be more uniformly distributed over a broad area.

Internal combustion engines, principally in vehicles, produce carbon monoxide due to incomplete fuel combustion. Various industrial processes also produce carbon monoxide emissions through incomplete combustion. Gasoline-powered motor vehicles are typically the

major source of this contaminant. Carbon monoxide does not irritate the respiratory tract, but passes through the lungs directly into the blood stream, and by interfering with the transfer of fresh oxygen to the blood, deprives sensitive tissues of oxygen, thereby aggravate cardiovascular disease, causing fatigue, headaches, and dizziness. Carbon monoxide is not known to have adverse effects on vegetation, visibility, or materials.

Table 4-3 reports carbon monoxide levels at the Santa Maria monitoring station only during 2012 when it was below the California Ambient Air Quality Standards and National Ambient Air Quality Standards. Historically, Santa Maria data for carbon monoxide has been below the California Ambient Air Quality Standards and National Ambient Air Quality Standards.

Nitrogen Dioxide and Hydrocarbons

Santa Barbara County has been designated as an attainment area for the National Ambient Air Quality Standards for nitrogen dioxide. Mobile sources and oil and gas production account for a large proportion of the county's nitrogen oxide emissions, most of which is emitted as nitrogen dioxide. Combustion in motor vehicle engines, power plants, refineries and other industrial operations are the primary sources in the region. Railroads and aircraft are other potentially significant sources of combustion air contaminants. Oxides of nitrogen are direct participants in photochemical smog reactions. The emitted compound, nitric oxide, combines with oxygen in the atmosphere in the presence of hydrocarbons and sunlight to form nitrogen dioxide and ozone. Nitrogen dioxide, the most significant of the nitrogen oxide pollutants, can color the atmosphere at concentrations as low as 0.5 parts per million on days of ten mile visibility. Nitrogen oxide is a significant air pollutant in the region as a precursor to photochemical smog but it also reacts in the air to form nitrate particulates.

Motor vehicles are the major source of reactive hydrocarbons in the basin. Other sources include evaporation of organic vapors from solvents, paints, coatings, fugitive gas leaks in connectors, valves or seals associated with petroleum production, refining, storage, dispensing, and transportation. Certain hydrocarbons can damage plants by inhibiting growth and by causing flowers and leaves to fall. Levels of hydrocarbons currently measured in urban areas are not known to cause adverse effects in humans. However, certain members of this contaminant group are important components in the reactions, which produce photochemical oxidants.

Table 4-3 shows that the Federal or State nitrogen dioxide standards have not been exceeded at the Santa Maria monitoring station during the three-year period from 2012 through 2014. Hydrocarbons are not currently monitored.

Sulfur Dioxide

Santa Barbara County has been designated as an attainment area for the National Ambient Air Quality Standards for sulfur dioxide. Sulfur dioxide is the primary combustion product of sulfur, or sulfur containing fuels. Fuel combustion is the major source of this pollutant, while chemical plants, sulfur recovery plants, and metal processing facilities are minor contributors. Gaseous fuels (natural gas, propane, etc.) typically have lower percentages of sulfur containing compounds than liquid fuels such as diesel or crude oil. Sulfur dioxide levels are generally

higher in the winter months. Decreasing levels of sulfur dioxide in the atmosphere reflect the use of natural gas in power plants and boilers.

At high concentrations, sulfur dioxide irritates the upper respiratory tract. At lower concentrations, when respired in combination with particulates, sulfur dioxide can result in greater harm by injuring lung tissues. Sulfur oxides, in combination with moisture and oxygen, results in the formation of sulfuric acid, which can yellow the leaves of plants, dissolve marble, and oxidize iron and steel. Sulfur oxides can also react to produce sulfates that reduce visibility and sunlight.

Table 4-3 shows data for only 2012 and 2013 in Lompoc.

Lead and Suspended Sulfate

Ambient lead levels have dropped dramatically since California prohibited lead gasoline additives in 1982. Historic ambient lead levels in Santa Barbara County are well below the ambient standard and are expected to continue to decline. Suspended lead levels have stabilized to the point where no excesses of the State standard are expected in any given year.

Hazardous Air Pollutants

Hazardous Air Pollutants are materials that are known or suspected to cause cancer, genetic mutations, birth defects, or other serious illnesses in humans. Hazardous Air Pollutants may be emitted from three main source categories: 1) industrial facilities; 2) internal combustion engines (stationary and mobile); and 3) small “area sources” (such as solvent use). The California Air Resources Board publishes lists of Volatile Organic Compound Species Profiles for many industrial applications and substances (California Air Resources Board 2006a). Generally, Hazardous Air Pollutants behave in the atmosphere in the same general way as inert pollutants (those that do not react chemically, but preserve the same chemical composition from point of emission to point of impact). The concentrations of toxic pollutants are therefore determined by the quantity and concentration emitted at the source and the meteorological conditions encountered as the pollutants are transported away from the source. Thus, impacts from toxic pollutant emissions tend to be site-specific and their intensity is subject to constantly changing meteorological conditions. The worst-case meteorological conditions that negatively affect short-term impacts are low wind speeds, highly stable air mass, and constant wind direction.

Odorous Compounds

Several compounds associated with the oil and gas industry can produce odors that can be determined to be nuisances. Sulfur compounds, found in oil and gas, have very low odor threshold levels. For instance, hydrogen sulfide can be detected by two percent of the human population at concentrations as low as 0.5 parts per billion. Concentrations of 40 parts per billion typically qualify as annoying to 50 percent of the population. These levels are significantly lower than concentrations that could affect human health: two parts per million [2,000 parts per billion] can cause headaches and increased airway resistance in asthmatics. Inhalation of more

than 600 parts per million can be instantly lethal and inhalation of over 100 parts per million can be lethal if exposed to for more than 60 minutes [ERPG-3].

Many volatile compounds found in oil and gas (ethane and longer chain hydrocarbons) typically have petroleum or gasoline odor with various odor thresholds. Natural gas contains mostly methane (which is odorless), and, by law, must be odorized before being placed into a distribution pipeline. The various odorizing compounds used contain sulfur compounds having a very low odor threshold and can produce odors if released into the atmosphere.

GREENHOUSE GASES

Greenhouse gases are defined as any gas that absorbs infrared radiation (heat) in the earth's atmosphere, including water vapor, carbon dioxide, methane, nitrous oxide and fluorocarbons. In general, most greenhouse gasses do not have a localized effect, but rather contribute to ambient concentrations that contribute to "global" climate effects.

Greenhouse gases lead to the trapping and buildup of heat in the atmosphere near the earth's surface, commonly known as the "greenhouse effect". The accumulation of greenhouse gases in the atmosphere influences the earth's temperature. Greenhouse gases are vital to life on Earth; without them Earth would be an icy planet (California Air Resources Board 2006). Emissions from human activities, such as the burning of fossil fuels, have elevated the concentration of these gases in the atmosphere. A warming trend of about 0.7 degrees Fahrenheit to 1.5 degrees Fahrenheit reportedly occurred during the 20th century, and a number of scientific analyses indicate that rising levels of greenhouse gases in the atmosphere may be contributing to climate change (Environmental Protection Agency 2000).

If the average temperature of the Earth increases significantly, some scientists predict that weather may be affected, including changes in precipitation patterns, accumulation of snow pack, and intensity and duration of spring snowmelt. There may be rises in sea level, resulting in coastal erosion and inundation of coastal areas. Emissions of air pollutants and ambient levels of pollutants also may be affected in areas. Climate zones may change, affecting the ecology and biological resources of a region. There may be changes in fire hazards due to the changes in precipitation and climate zones.

Greenhouse gases have varying global warming potential. The global warming potential is the potential of a gas or aerosol to trap heat in the atmosphere. Because greenhouse gases absorb different amounts of heat, a common reference gas (carbon dioxide) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as the "carbon dioxide equivalent". This is the amount of greenhouse gases emitted multiplied by the global warming potential. The global warming potential of carbon dioxide is defined as one, whereas the global warming potential of methane, for example, is 21, meaning that methane gas absorbs 21 times as much heat, and therefore has 21 times greater impact on global warming per pound of emissions, as carbon dioxide.

Carbon dioxide is an odorless, colorless greenhouse gas. Natural sources of carbon dioxide include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic (human caused)

sources of carbon dioxide include burning fuels, such as coal, oil, natural gas, and wood. Average atmospheric carbon dioxide concentrations were 398.55 parts per million during 2014 (National Oceanic and Atmospheric Administration, 2015). However, some believe that concentrations may increase to 540 parts per million by 2100 as a direct result of anthropogenic sources and result in an average global temperature rise of at least two degrees Celsius (3.6 degrees Fahrenheit) (IPCC 2007).

Methane gas is the main component of natural gas used in homes. As discussed above, it has a global warming potential of about 21. Natural sources of methane arise from the decay of organic matter. Decayed organic matter trapped in geological deposits can be extracted as natural gas, which is used for fuel. Other sources of decaying organic material that are sometimes also used as fuel include landfills, sewage treatment plants, and animal manure.

Nitrous oxide is a colorless gas with a global warming potential of about 310 that is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (nylon production, nitric acid production) also emit nitrogen dioxide. It is used in rocket engines, as an aerosol spray propellant, and in race cars. During combustion, nitrogen oxide (nitrogen oxides is a generic term for mono-nitrogen oxides, nitric oxide and nitrogen dioxide) is produced as a criterion pollutant (see above), and is not the same as nitrous oxide. Very small quantities of nitrous oxide may be formed during fuel combustion by reaction of nitrogen and oxygen (API 2004).

Chlorofluorocarbons are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with either chlorine and/or fluorine atoms. Chlorofluorocarbons are nontoxic, nonflammable, insoluble, and chemically nonreactive in the troposphere (the level of air at the earth's surface). Chlorofluorocarbons were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone; therefore, their production was stopped as required by the Montreal Protocol. Hydrofluorocarbons are synthetic man-made chemicals that are used as a substitute for Chlorofluorocarbons in automobile air conditioners and refrigerants. Perfluorocarbons are used in aluminum production and semiconductor manufacture industry. In general, fluorocarbons have a global warming potential of between 140 and 11,700.

Sulfur hexafluoride is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest global warming potential of any gas at 23,900. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Ozone is a greenhouse gas; however, unlike the other greenhouse gases, ozone in the troposphere is relatively short-lived and therefore is not global in nature. According to California Air Resources Board, it is difficult to make an accurate determination of the contribution of ozone precursors (nitrogen oxides and volatile organic compounds) to global warming (California Air Resources Board 2006b).

Table 4-4 shows a range of gasses that contribute to greenhouse gas warming with their associated global warming potential.

Table 4-4 - Global Warming Potential of Various Gases

Gas	20-Year Global Warming Potential (average)
Carbon Dioxide	1
Methane	21
Nitrous Oxide	310
HFC-23	11,700
HFC-32	650
HFC-125	2,800
HFC-134a	1,300
HFC-143a	3,800
HFC-152a	140
HFC-227ea	2,900
HFC-236fa	6,300
HFC-4310mcc	1,300
CF4	6,500
C2F6	9,200
C4F10	7,000
C6F14	7,400
SF6	23,900

Source: Environmental Protection Agency 2014

Fossil fuel combustion represents the vast majority of the anthropogenic greenhouse gas emissions, with carbon dioxide being the primary greenhouse gas. The total U.S. greenhouse gas emissions were 7,260 million metric tons of carbon equivalents in 2005, of which 84 percent were carbon dioxide emissions (Environmental Protection Agency 2014).

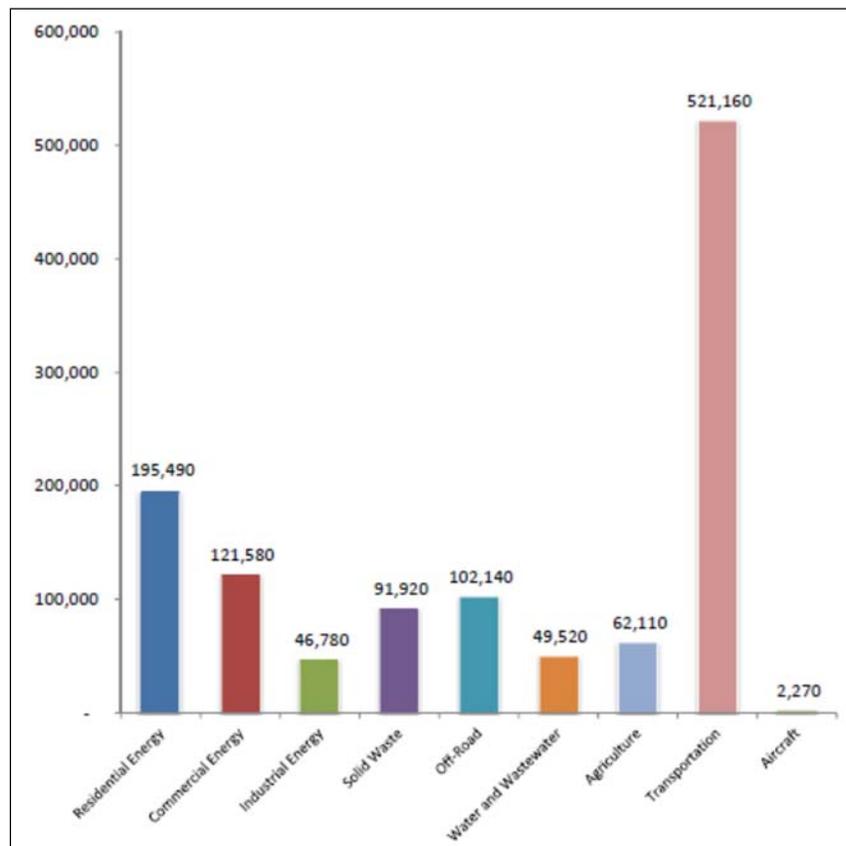
California greenhouse gas emissions would rank 16th largest in the world. In 2012, California produced 459 million metric tons of carbon dioxide equivalent greenhouse gas emissions; this is a decrease of 1.6 percent from 2000 emissions (California Air Resources Board 2014b). The transportation sector is the single largest category of California's greenhouse gas emissions, producing approximately 40 percent of the State's total greenhouse gas emissions in 2012. Electrical generation produced approximately 24 percent of greenhouse gas emissions. Most of California's emissions, 80 percent, are carbon dioxide produced from fossil fuel combustion (California Air Resources Board 2014b).

Countywide Greenhouse Gas Emissions

The Santa Barbara County Climate Action Strategy (2011) was developed to address greenhouse gas emissions pursuant to the Santa Barbara County Board of Supervisors' March 2009 direction (Board of Supervisors Resolution 09-059) "to take immediate, cost effective, and coordinated steps to reduce the County's collective greenhouse gas emissions." Phase 1 was the preparation of a Climate Action Study, and Phase 2 is the development of a Climate Action Plan. The Study included: a greenhouse gas inventory and forecast for the unincorporated County; a discussion of greenhouse gas emission reduction target options that the County could pursue; a list of current County activities which reduce greenhouse gas emissions; evaluation of potential additional emission reduction measures the County could implement; and recommendations for implementation of the Study through an Energy and Climate Action Plan Summary Information (Santa Barbara County 2013).

The Energy and Climate Action Plan was adopted in May 2015 and seeks to reduce Santa Barbara County's greenhouse gas emissions through implementation of emission reduction measures with the goal of achieving a greenhouse gas reduction target of 15 percent below baseline emissions by the year 2020. The Energy and Climate Action Plan serves as a qualified greenhouse gas reduction strategy consistent with the California Environmental Quality Act (Santa Barbara County 2015).

Figure 4-1 depicts Santa Barbara County's 2007 greenhouse gas emissions inventory by sector; total greenhouse gas emissions were estimated at approximately 1.19 million tonnes in 2007 (Santa Barbara County 2015).



Source: Santa Barbara County 2015

Figure 4-1 - 2007 Unincorporated Santa Barbara County Greenhouse Gas Emissions by Sector

Calculation of Greenhouse Gas Emissions

The quantification of greenhouse gas emissions associated with a Project can be complex and relies on a number of assumptions. Greenhouse gas emissions impacts are global, not local. Emissions are generally classified as either direct or indirect emissions are produced at the Project site. These would include the combustion of natural gas in heaters or stoves, the combustion of fuel in engines and construction vehicles, and fugitive emissions from valves, seals, and connectors. Indirect emissions are emissions created as part of the Project, but created outside of the Project site, including electrical power purchased from the grid, and transportation used to bring goods and materials to the Project site.

This report utilizes the California Climate Action Registry General Reporting Protocol (California Climate Action Registry 2009), the California Air Resources Board Compendium of Emission Factors and Methods to Support Mandatory Reporting of Greenhouse Gas Emissions (California Air Resources Board 2007), EMFAC2014, and California Emissions Estimator Model as methods to calculate greenhouse gas emissions. Indirect greenhouse gas emissions associated with trash hauling and other transportation services are included in the total diesel truck emissions.

COUNTYWIDE CRITERIA POLLUTANT EMISSION INVENTORY

California Air Resources Board maintains emissions inventories for criteria air pollutants for stationary, area-wide, mobile and natural emissions sources. **Table 4-5** presents the California Air Resources Board data for 2012 within Santa Barbara County. Stationary sources include power plants, refineries and manufacturing facilities. Area-wide sources are estimated from consumer products, fireplaces, road dust and agricultural operations. Mobile sources account for on-road (automobiles, motorcycles and trucks) and off-road vehicle (off-road engines and equipment, recreational vehicles, farm and construction equipment, locomotives, and marine vessels) operations. Natural sources are non-manmade emissions sources, including biological and geological sources, wildfires, windblown dust and biogenic emissions. Mobile sources account for 40 percent of carbon monoxide emissions and 92 percent of nitrogen oxide emissions. Natural sources, which include natural uncontrolled seeps of oil and gas constituents, account for 55 percent of carbon monoxide emissions and 84 percent of reactive organic gas emissions (California Air Resources Board 2014a).

Table 4-5 - 2012 Emission Inventory for Santa Barbara County

Emission Sources	Carbon Monoxide Tons/Year	Reactive Organic Gas Tons/Year	Nitrogen Oxide Tons/Year	Sulfur Oxides Tons/Year	Particulate Matter (PM ₁₀) Tons/Year	Particulate Matter (PM _{2.5}) Tons/Year
Stationary	2,811	3,431	1,606	329	329	146
Area-wide	2,519	3,176	329	0	3,942	840
Mobile	39,712	4,125	28,506	4,453	1,351	1,168
Natural	55,298	57,086	694	401	5,439	4,599
All Sources	100,340	67,818	31,135	5,183	11,061	6,653

Source: California Air Resources Board 2014a

COUNTYWIDE AIR TOXICS

Air toxics are materials that are known or suspected to cause cancer, genetic mutations, birth defects, or other serious illnesses in humans. Air toxics may be emitted from three main source categories: 1) industrial facilities; 2) internal combustion engines (mobile and stationary); and 3) small area sources (such as solvent use). California Air Resources Board publishes lists of Volatile Organic Compound Species Profiles for many industrial applications and substances (California Air Resources Board 2013).

Generally, air toxics behave in the atmosphere in the same general way as inert pollutants (those that do not react chemically, but preserve the same chemical composition from point of emission to point of impact). The concentrations of toxic pollutants are therefore determined by the quantity and concentration emitted at the source and the meteorological conditions encountered

as the pollutants are transported away from the source. Thus, impacts from toxic pollutant emissions tend to be site-specific and their intensity is subject to constantly changing meteorological conditions. The worst-case meteorological conditions that negatively affect short-term impacts are low wind speeds, highly stable air mass, and constant wind direction.

5.0 PROJECT-IMPACT ANALYSIS FOR CRITERIA POLLUTANTS

This Air Quality Impact Analysis was prepared pursuant to the Santa Barbara County Air Pollution Control District's Environmental Review Guidelines (Santa Barbara County Air Pollution Control District 1995, revised 2000), Santa Barbara County Air Pollution Control District's Scope and Content of Air Quality Sections in Environmental Documents (2014), the Santa Barbara County's Environmental Thresholds and Guidelines Manual (2008), the California Environmental Quality Act (Public Resources Code 21000 to 21177) and California Environmental Quality Act Guidelines (California Code of Regulations Title 14, Division 6, Chapter 3, Sections 15000 – 15387).

5.1 IMPACT AQ-1: SHORT-TERM CONSTRUCTION EMISSIONS

Short-term emissions will be produced from the Project's Phase I and Phase II construction and drilling activities and are recognized to be short in duration and without lasting impacts on air quality.

Equipment Exhaust

California Emissions Estimator Model was used to estimate short-term emissions from construction equipment using a specific list and schedule. The construction plan provided by the applicant detailed the various types and quantity of each type of equipment used per month; therefore, it was assumed that if a piece of equipment was active during a particular month then it will operate the full ten hours per day for each construction day in that month. Construction days per month were based on the construction schedule of six days per week. The drilling plan provided drilling equipment and operating hours per month and year. The annual operating hours were divided by annual working days to obtain the hours per day per piece of equipment. If the hours per day exceeded 24 hours then two pieces of that equipment type were assumed. The drilling plan also includes drilling of up to 30 replacement wells. A maximum of only one replacement well will be drilled per year. Specific equipment horsepower was used where available and default load factors from California Emissions Estimator Model were utilized. Detailed equipment listings are provided in **Attachment A**.

Fugitive Dust

California Emissions Estimator Model was used to estimate short-term fugitive dust emissions from grading, cut and fills, and unpaved road vehicle travel. The area of disturbance for grading (**Table 5-1**) and cut and fill volumes (**Table 5-1**) were provided by the Project applicant and input into California Emissions Estimator Model. The distance of unpaved road travel during construction (**Tables 5-2 and 5-3**) was estimated based on aerial photos and multiplied by the estimated trips.

Table 5-1 - Grading Area and Cut and Fill Volumes by Year

Year	Grading Area (acres/year)	Fill Volumes (cubic yards)	Cut Volumes (cubic yards)
2017	50.53	266,903	521,238
2018	42.41	310,882	435,779
2019	59.80	768,987	284,010
2020	10.59	35,804	121,268
2024	81.06	975,163	1,444,936
2026	2.50	13,724	6,276
2029	3.00	0	42,099
2030	3.52	13,573	25,199
2031	10.88	207,038	78,439
2034	4.72	17,828	11,997
2035	36.04	501,266	177,032

Table 5-2 - Construction Vehicles Travel Distance by Year

Year	Vehicle Type	Unpaved Travel Distance (miles/year)	Paved Travel Distance (miles/year)
Project Construction Activities			
2017	Autos	2,847.0	153,738.0
2017	Trucks	126.6	6,836.4
2018	Autos	25,193.4	1,360,443.6
2018	Trucks	726.6	69,833.4
2019	Autos	42,336.6	2,286,176.4
2019	Trucks	442.2	76,278.0
2020	Autos	3,032.4	163,749.6
2020	Trucks	4.8	1,233.6
2021	Autos	2,896.8	156,427.2
2021	Trucks	4.8	1,233.6
2022	Autos	1,039.2	56,116.8
2022	Trucks	3.0	771.0
2023	Autos	15,054.0	812,916.0
2023	Trucks	282.0	36,125.8
2024	Autos	21,332.4	1,151,949.6
2024	Trucks	345.6	55,637.8
2025	Autos	187.2	10,108.8
2025	Trucks	1.2	308.4
2026	Autos	979.2	52,876.8
2026	Trucks	0.6	154.2
2028	Autos	937.8	50,641.2
2028	Trucks	1.2	308.4

Year	Vehicle Type	Unpaved Travel Distance (miles/year)	Paved Travel Distance (miles/year)
2029	Autos	531.6	28,706.4
2029	Trucks	1.2	308.4
2030	Autos	1,568.4	84,693.6
2030	Trucks	1.2	308.4
2031	Autos	1,780.2	96,130.8
2031	Trucks	1.2	308.4
2032	Autos	480.6	25,952.4
2032	Trucks	0.6	154.2
2033	Autos	93.6	5,054.4
2034	Autos	601.2	32,464.8
2035	Autos	4,507.8	243,421.2
2035	Trucks	3.0	771.0
2036	Autos	93.6	5,054.4
2037	Autos	93.6	5,054.4
14-Mile Fuel Line Construction Activities			
2018	Autos	9,034.8	487,879.2
2018	Trucks	40.2	10,331.4
115KV Interconnect and Substation Construction Activities			
2017	Autos	733.2	39,592.8

Table 5-3 - Drilling Vehicles Travel Distance by Year

Year	Vehicle Type	Unpaved Travel Distance (miles/year)	Paved Travel Distance (miles/year)
2018	Unpaved Roads Autos	1,466.4	79,185.6
2018	Unpaved Roads Trucks	36.6	8,066.4
2019	Unpaved Roads Autos	8,826.6	476,636.4
2019	Unpaved Roads Trucks	619.2	135,018.0
2021	Unpaved Roads Autos	733.2	39,592.8
2021	Unpaved Roads Trucks	13.8	2,937.6
2022	Unpaved Roads Autos	733.2	39,592.8
2022	Unpaved Roads Trucks	13.8	2,937.6
2023	Unpaved Roads Autos	733.2	39,592.8
2023	Unpaved Roads Trucks	13.8	2,937.6
2024	Unpaved Roads Autos	8,854.8	478,159.2
2024	Unpaved Roads Trucks	643.2	140,089.8
2025	Unpaved Roads Autos	1,494.6	80,708.4
2025	Unpaved Roads Trucks	28.8	6,427.2
2026	Unpaved Roads Autos	3,722.4	201,009.6
2026	Unpaved Roads Trucks	108	23,614.8
2027	Unpaved Roads Autos	1,466.4	79,185.6

Year	Vehicle Type	Unpaved Travel Distance (miles/year)	Paved Travel Distance (miles/year)
2027	Unpaved Roads Trucks	42.6	9,243.0
2028	Unpaved Roads Autos	1,466.4	79,185.6
2028	Unpaved Roads Trucks	36.6	8,066.4
2029	Unpaved Roads Autos	2961	159,894.0
2029	Unpaved Roads Trucks	99	21,667.2
2030	Unpaved Roads Autos	4,455.6	240,602.4
2030	Unpaved Roads Trucks	151.8	33,166.2
2031	Unpaved Roads Autos	2,989.2	161,416.8
2031	Unpaved Roads Trucks	103.2	22,503.0
2032	Unpaved Roads Autos	3,666	197,964.0
2032	Unpaved Roads Trucks	112.2	24,450.6
2033	Unpaved Roads Autos	1,466.4	79,185.6
2033	Unpaved Roads Trucks	36.6	8,066.4
2034	Unpaved Roads Autos	3,694.2	199,486.8
2034	Unpaved Roads Trucks	126	27,388.2
2035	Unpaved Roads Autos	8,093.4	437,043.6
2035	Unpaved Roads Trucks	252	54,898.2
2036	Unpaved Roads Autos	1,494.6	80,708.4
2036	Unpaved Roads Trucks	49.8	10,849.8
2037	Unpaved Roads Autos	1,494.6	80,708.4
2037	Unpaved Roads Trucks	49.8	10,849.8
2038	Unpaved Roads Autos	1,466.4	79,185.6
2038	Unpaved Roads Trucks	49.8	10,849.8
2039	Unpaved Roads Autos	1,438.2	77,662.8
2039	Unpaved Roads Trucks	49.8	10,849.8
2040	Unpaved Roads Autos	1,466.4	79,185.6
2040	Unpaved Roads Trucks	49.8	10,849.8
2041	Unpaved Roads Autos	1,466.4	79,185.6
2041	Unpaved Roads Trucks	49.8	10,849.8
2042	Unpaved Roads Autos	1,494.6	80,708.4
2042	Unpaved Roads Trucks	49.8	10,849.8
2043	Unpaved Roads Autos	1,494.6	80,708.4
2043	Unpaved Roads Trucks	49.8	10,849.8
2044	Unpaved Roads Autos	1,466.4	79,185.6
2044	Unpaved Roads Trucks	49.8	10,849.8
2045	Unpaved Roads Autos	1,466.4	79,185.6
2045	Unpaved Roads Trucks	49.8	10,849.8
2046	Unpaved Roads Autos	1,466.4	79,185.6
2046	Unpaved Roads Trucks	49.8	10,849.8
2047	Unpaved Roads Autos	1,466.4	79,185.6

Year	Vehicle Type	Unpaved Travel Distance (miles/year)	Paved Travel Distance (miles/year)
2047	Unpaved Roads Trucks	49.8	10,849.8
2048	Unpaved Roads Autos	1,494.6	80,708.4
2048	Unpaved Roads Trucks	49.8	10,849.8
2049	Unpaved Roads Autos	1,466.4	79,185.6
2049	Unpaved Roads Trucks	49.8	10,849.8

Table 5-4 – Replacement Well Drilling Vehicles Travel Distance by Year

Year	Vehicle Type	Unpaved Travel Distance (miles/year)	Paved Travel Distance (miles/year)
2019-2048	Unpaved Roads Autos	73.2	3,879.6
2019-2048	Unpaved Roads Trucks	4.8	1,107.0

Offsite Mobile Exhaust

EMFAC2014 emission factors were used to estimate short-term emissions from employee's travel, equipment deliveries and material deliveries. Employees were assumed to travel an estimated roundtrip distance of 32.4 miles. Equipment and material deliveries were estimated to originate from Santa Maria, Bakersfield, and out of state (entering California along Highway 40) with round trip distances of 32.4, 276, and 808 miles respectively. Some deliveries will originate from both Santa Maria and Bakersfield; therefore, an average round trip distance of 154.2 miles was used. Employee's vehicles were assumed to be gasoline fueled light duty auto and delivery vehicles were assumed to be diesel heavy-heavy duty T7 Construction Tractors. All vehicle trips were assumed to use a trip speed of 55 miles per hour. The construction and drilling trips were estimated using the Project applicants detailed schedules. **Tables 5-1, 5-2, 5-3 and 5-4** above summarize the distance traveled by construction employees and equipment and delivery trucks.

Short-Term Emissions

Tables 5-5 through 5-10 below summarize the short-term unmitigated emissions calculated for this Project. Calculation and summary spreadsheets are available in **Attachment A**. The output from California Emissions Estimator Model runs are available in **Attachment B**.

Table 5-5 - Project Short Term Unmitigated Construction Emissions – By Year

Year	Total Emissions						
	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2017	1.89	9.64	23.78	0.02	3.06	1.09	2,246.65
2018	3.85	21.71	37.78	0.04	18.94	3.32	4,489.95
2019	5.47	32.26	50.06	0.06	30.81	5.10	6,055.54
2020	0.75	4.35	8.12	0.01	2.38	0.52	932.80
2021	0.66	4.12	7.06	0.01	2.22	0.47	879.19
2022	0.28	1.64	3.10	0.01	0.81	0.18	462.62
2023	1.12	8.82	9.49	0.02	10.56	1.40	1,782.39

Year	Total Emissions						
	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2024	3.42	25.37	31.65	0.06	15.85	2.68	5,809.29
2025	0.01	0.06	0.10	0.00	0.13	0.02	19.28
2026	0.26	2.06	2.36	0.01	0.75	0.16	468.34
2027	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2028	0.22	1.50	2.13	0.00	0.71	0.14	450.33
2029	0.11	0.79	1.01	0.00	0.40	0.07	177.00
2030	0.27	2.16	1.07	0.01	1.08	0.14	610.48
2031	0.36	2.59	1.43	0.01	1.25	0.17	808.61
2032	0.11	0.98	0.45	0.00	0.33	0.04	232.49
2033	0.00	0.02	0.01	0.00	0.06	0.01	10.68
2034	0.23	1.51	0.93	0.01	0.44	0.07	503.11
2035	0.71	5.86	2.23	0.02	3.12	0.37	1,805.79
2036	0.00	0.02	0.01	0.00	0.06	0.01	10.65
2037	0.00	0.02	0.01	0.00	0.06	0.01	10.65

Definitions:
 CO = carbon monoxide
 NOx= nitrogen oxide
 PM₁₀ = particulate matter of 10 microns
 PM_{2.5} = particulate matter of less than 2.5 microns
 ROC = reactive organic compound
 SOx = sulfur oxide
 CO_{2e} = carbon dioxide equivalent
 MT = metric ton

Table 5-6 - 14-Mile Fuel Line Unmitigated Construction Emissions – By Year

Year	Total Emissions						
	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2018	3.46	24.44	36.67	0.04	7.81	2.28	4,049.89

Definitions:
 CO = carbon monoxide
 NOx= nitrogen oxide
 PM₁₀ = particulate matter of 10 microns
 PM_{2.5} = particulate matter of less than 2.5 microns
 ROC = reactive organic compound
 SOx = sulfur oxide
 CO_{2e} = carbon dioxide equivalent
 MT = metric ton

Table 5-7 - 115KV Interconnect and Substation Unmitigated Construction Emissions – By Year

Year	Total Emissions						
	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2017	0.13	0.76	1.09	0.00	0.55	0.11	106.81

Definitions:
 CO = carbon monoxide
 NOx= nitrogen oxide
 PM₁₀ = particulate matter of 10 microns
 PM_{2.5} = particulate matter of less than 2.5 microns
 ROC = reactive organic compound
 SOx = sulfur oxide
 CO_{2e} = carbon dioxide equivalent
 MT = metric ton

Table 5-8 - Drilling Short Term Unmitigated Construction Emissions – By Year

Year	Total Emissions						
	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2017	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018	0.23	1.20	2.57	0.00	1.08	0.18	538.28
2019	3.40	18.48	36.25	0.08	7.37	1.72	8,378.02
2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2021	0.07	0.44	0.08	0.00	0.52	0.07	201.93
2022	0.07	0.46	0.62	0.00	0.51	0.07	214.90
2023	0.07	0.45	0.55	0.00	0.51	0.07	214.51
2024	2.71	18.32	20.58	0.08	6.92	1.26	8,835.31
2025	0.11	0.83	0.80	0.00	1.03	0.12	402.48
2026	0.44	3.12	3.07	0.01	2.63	0.34	1,510.81
2027	0.18	1.25	1.24	0.01	1.04	0.14	605.87
2028	0.15	1.07	1.05	0.00	1.03	0.13	516.68
2029	0.40	2.84	2.82	0.01	2.11	0.29	1,379.02
2030	0.52	4.22	2.01	0.02	3.11	0.37	2,199.53
2031	0.35	2.87	1.37	0.01	2.09	0.25	1,499.71
2032	0.39	3.15	1.50	0.02	2.54	0.30	1,642.81
2033	0.13	1.04	0.49	0.01	1.01	0.11	540.29
2034	0.44	3.55	1.69	0.02	2.58	0.30	1,851.74
2035	0.88	7.67	2.59	0.04	5.61	0.63	4,011.19
2036	0.17	1.44	0.49	0.01	1.04	0.12	750.21
2037	0.17	1.44	0.49	0.01	1.04	0.12	750.07
2038	0.17	1.44	0.49	0.01	1.02	0.12	749.67
2039	0.17	1.43	0.49	0.01	1.00	0.11	749.30
2040	0.16	1.43	0.42	0.01	1.02	0.11	749.51
2041	0.16	1.43	0.42	0.01	1.02	0.11	749.45
2042	0.16	1.43	0.42	0.01	1.04	0.11	749.69
2043	0.16	1.43	0.42	0.01	1.04	0.11	749.65
2044	0.16	1.43	0.42	0.01	1.02	0.11	749.35
2045	0.16	1.43	0.42	0.01	1.02	0.11	749.32
2046	0.16	1.43	0.42	0.01	1.02	0.11	749.31
2047	0.16	1.43	0.42	0.01	1.02	0.11	749.29
2048	0.16	1.43	0.42	0.01	1.04	0.11	749.56
2049	0.16	1.43	0.42	0.01	1.02	0.11	749.27
Definitions:							
CO =	carbon monoxide		ROC =	reactive organic compound			
NOx=	nitrogen oxide		SOx =	sulfur oxide			
PM ₁₀ =	particulate matter of 10 microns		CO _{2e} =	carbon dioxide equivalent			
PM _{2.5} =	particulate matter of less than 2.5 microns		MT =	metric ton			

Table 5-9 – Replacement Well Drilling Short Term Unmitigated Construction Emissions – By Year

Year	Total Emissions						
	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2019	0.04	0.22	0.45	0.00	0.07	0.02	101.79
2020	0.04	0.22	0.39	0.00	0.06	0.02	101.48
2021	0.03	0.22	0.34	0.00	0.06	0.02	101.43
2022	0.03	0.21	0.30	0.00	0.06	0.01	101.37
2023	0.03	0.21	0.26	0.00	0.06	0.01	101.34
2024	0.03	0.21	0.24	0.00	0.06	0.01	101.31

Year	Total Emissions						
	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2025	0.03	0.21	0.21	0.00	0.06	0.01	101.27
2026	0.03	0.21	0.21	0.00	0.06	0.01	101.24
2027	0.03	0.21	0.21	0.00	0.06	0.01	101.22
2028	0.03	0.21	0.21	0.00	0.06	0.01	101.20
2029	0.03	0.21	0.21	0.00	0.06	0.01	101.17
2030	0.03	0.20	0.09	0.00	0.06	0.01	103.40
2031	0.03	0.20	0.09	0.00	0.06	0.01	103.38
2032	0.03	0.20	0.09	0.00	0.06	0.01	103.36
2033	0.03	0.20	0.09	0.00	0.06	0.01	103.35
2034	0.03	0.20	0.09	0.00	0.06	0.01	103.34
2035	0.02	0.20	0.07	0.00	0.05	0.01	103.33
2036	0.02	0.20	0.07	0.00	0.05	0.01	103.32
2037	0.02	0.20	0.07	0.00	0.05	0.01	103.32
2038	0.02	0.20	0.07	0.00	0.05	0.01	103.31
2039	0.02	0.20	0.07	0.00	0.05	0.01	103.31
2040	0.02	0.20	0.06	0.00	0.05	0.01	103.30
2041	0.02	0.20	0.06	0.00	0.05	0.01	103.30
2042	0.02	0.20	0.06	0.00	0.05	0.01	103.30
2043	0.02	0.20	0.06	0.00	0.05	0.01	103.30
2044	0.02	0.20	0.06	0.00	0.05	0.01	103.30
2045	0.02	0.20	0.06	0.00	0.05	0.01	103.30
2046	0.02	0.20	0.06	0.00	0.05	0.01	103.29
2047	0.02	0.20	0.06	0.00	0.05	0.01	103.29
2048	0.02	0.20	0.06	0.00	0.05	0.01	103.29
Definitions:							
CO =	carbon monoxide		ROC =	reactive organic compound			
NOx=	nitrogen oxide		SOx =	sulfur oxide			
PM ₁₀ =	particulate matter of 10 microns		CO _{2e} =	carbon dioxide equivalent			
PM _{2.5} =	particulate matter of less than 2.5 microns		MT =	metric ton			

Table 5-10 - Short Term Unmitigated Construction Emissions – Peak Year

Activity	Total Emissions ¹						
	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
Construction Equipment Exhaust	5.42	31.73	49.19	0.06	2.39	2.23	5,460.8
Construction Offsite Mobile Exhaust	0.06	0.53	0.87	0.00	0.04	0.04	348.5
Construction Fugitive Dust	-	-	-	-	28.42	2.84	-
Drilling Equipment Exhaust	3.39	18.12	35.58	0.08	1.11	1.09	8,526.7
Drilling Offsite Mobile Exhaust	0.02	0.36	0.67	0.00	0.005	0.005	308.6
Drilling Fugitive Dust	-	-	-	-	6.247	0.624	-
Replacement Well Drilling Equipment Exhaust	0.04	0.22	0.44	0.001	0.014	0.014	98.86
Replacement Well Drilling Offsite Mobile Exhaust	0.000	0.003	0.005	0.00	0.000	0.000	2.69
Replacement Well Drilling Fugitive Dust	-	-	-	-	0.05	0.005	-

Year	Total Emissions						
	ROC (tons/yr)	CO (tons/yr)	NO _x (tons/yr)	SO _x (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2031	0.10	3.94	0.60	0.01	0.30	0.04	808.61
2032	0.03	1.29	0.25	0.00	0.08	0.01	232.49
2033	0.00	0.04	0.01	0.00	0.01	0.00	10.68
2034	0.06	2.38	0.37	0.01	0.11	0.02	503.11
2035	0.22	8.91	1.33	0.02	0.77	0.10	1,805.79
2036	0.00	0.04	0.01	0.00	0.01	0.00	10.65
2037	0.00	0.04	0.01	0.00	0.01	0.00	10.65

Definitions

CO =	carbon monoxide	PM _{2.5} =	particulate matter of less than 2.5 microns
NO _x =	nitrogen oxide	ROC =	reactive organic compound
PM ₁₀ =	particulate matter of 10 microns	SO _x =	sulfur oxide
		CO _{2e} =	carbon dioxide equivalent
		MT =	metric ton

Table 5-12 - 14-Mile Fuel Line Mitigated Construction Emissions – By Year

Year	Total Emissions						
	ROC (tons/yr)	CO (tons/yr)	NO _x (tons/yr)	SO _x (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2018	0.53	24.90	2.89	0.04	1.50	0.21	4,039.89

Definitions

CO =	carbon monoxide	PM _{2.5} =	particulate matter of less than 2.5 microns
NO _x =	nitrogen oxide	ROC =	reactive organic compound
PM ₁₀ =	particulate matter of 10 microns	SO _x =	sulfur oxide
		CO _{2e} =	carbon dioxide equivalent
		MT =	metric ton

Table 5-13 - 115KV Interconnect and Substation Mitigated Construction Emissions – By Year

Year	Total Emissions						
	ROC (tons/yr)	CO (tons/yr)	NO _x (tons/yr)	SO _x (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2017	0.02	0.66	0.18	0.00	0.12	0.01	103.81

Definitions:

CO =	carbon monoxide	PM _{2.5} =	particulate matter of less than 2.5 microns
NO _x =	nitrogen oxide	ROC =	reactive organic compound
PM ₁₀ =	particulate matter of 10 microns	SO _x =	sulfur oxide
		CO _{2e} =	carbon dioxide equivalent
		MT =	metric ton

Table 5-14 - Drilling Short Term Mitigated Construction Emissions – By Year

Year	Total Emissions (tons per year)						
	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2017	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018	0.06	2.23	0.33	0.00	0.25	0.03	538.28
2019	0.98	35.62	5.01	0.08	1.62	0.28	8,378.02
2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2021	0.02	0.85	0.12	0.00	0.12	0.01	201.93
2022	0.02	0.91	0.12	0.00	0.12	0.02	214.90
2023	0.02	0.90	0.11	0.00	0.12	0.02	214.51
2024	1.03	37.70	4.75	0.08	1.64	0.29	8,835.30
2025	0.05	1.69	0.21	0.00	0.25	0.03	402.48
2026	0.17	6.39	0.80	0.01	0.63	0.08	1,510.81
2027	0.07	2.57	0.32	0.01	0.25	0.03	605.87
2028	0.06	2.18	0.27	0.00	0.25	0.03	516.68
2029	0.16	5.85	0.73	0.01	0.50	0.07	1,379.01
2030	0.25	9.13	1.14	0.02	0.76	0.11	2,199.53
2031	0.17	6.23	0.78	0.01	0.51	0.07	1,499.71
2032	0.19	6.81	0.85	0.02	0.62	0.08	1,642.81
2033	0.06	2.23	0.28	0.01	0.25	0.03	540.29
2034	0.21	7.69	0.96	0.02	0.63	0.09	1,851.74
2035	0.45	16.67	2.06	0.04	1.38	0.19	4,011.18
2036	0.08	3.12	0.39	0.01	0.26	0.04	750.20
2037	0.08	3.12	0.39	0.01	0.26	0.04	750.07
2038	0.08	3.11	0.39	0.01	0.25	0.04	749.67
2039	0.08	3.11	0.39	0.01	0.25	0.03	749.30
2040	0.08	3.11	0.39	0.01	0.25	0.04	749.51
2041	0.08	3.11	0.39	0.01	0.25	0.04	749.45
2042	0.08	3.11	0.39	0.01	0.26	0.04	749.69
2043	0.08	3.11	0.39	0.01	0.26	0.04	749.65
2044	0.08	3.11	0.39	0.01	0.25	0.04	749.34
2045	0.08	3.11	0.39	0.01	0.25	0.04	749.32
2046	0.08	3.11	0.39	0.01	0.25	0.04	749.31
2047	0.08	3.11	0.39	0.01	0.25	0.04	749.29
2048	0.08	3.11	0.39	0.01	0.26	0.04	749.56
2049	0.08	3.11	0.39	0.01	0.25	0.04	749.27
Definitions: CO = carbon monoxide NOx= nitrogen oxide PM ₁₀ = particulate matter of 10 microns PM _{2.5} = particulate matter of less than 2.5 microns ROC = reactive organic compound SOx = sulfur oxide CO _{2e} = carbon dioxide equivalent MT = metric ton							

Table 5-15 – Replacement Well Drilling Short Term Mitigated Construction Emissions – By Year

Year	Total Emissions						
	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM ₁₀ (tons/yr)	PM _{2.5} (tons/yr)	CO _{2e} (MT/yr)
2019	0.01	0.44	0.06	0.00	0.01	0.00	101.79
2020	0.01	0.44	0.06	0.00	0.01	0.00	101.48
2021	0.01	0.43	0.06	0.00	0.01	0.00	101.43
2022	0.01	0.43	0.05	0.00	0.01	0.00	101.37
2023	0.01	0.43	0.05	0.00	0.01	0.00	101.34
2024	0.01	0.43	0.05	0.00	0.01	0.00	101.31
2025	0.01	0.43	0.05	0.00	0.01	0.00	101.27
2026	0.01	0.43	0.05	0.00	0.01	0.00	101.24
2027	0.01	0.43	0.05	0.00	0.01	0.00	101.22
2028	0.01	0.43	0.05	0.00	0.01	0.00	101.20
2029	0.01	0.43	0.05	0.00	0.01	0.00	101.17
2030	0.01	0.43	0.05	0.00	0.01	0.00	103.40
2031	0.01	0.43	0.05	0.00	0.01	0.00	103.38
2032	0.01	0.43	0.05	0.00	0.01	0.00	103.36
2033	0.01	0.43	0.05	0.00	0.01	0.00	103.35
2034	0.01	0.43	0.05	0.00	0.01	0.00	103.34
2035	0.01	0.43	0.05	0.00	0.01	0.00	103.33
2036	0.01	0.43	0.05	0.00	0.01	0.00	103.32
2037	0.01	0.43	0.05	0.00	0.01	0.00	103.32
2038	0.01	0.43	0.05	0.00	0.01	0.00	103.31
2039	0.01	0.43	0.05	0.00	0.01	0.00	103.31
2040	0.01	0.43	0.05	0.00	0.01	0.00	103.30
2041	0.01	0.43	0.05	0.00	0.01	0.00	103.30
2042	0.01	0.43	0.05	0.00	0.01	0.00	103.30
2043	0.01	0.43	0.05	0.00	0.01	0.00	103.30
2044	0.01	0.43	0.05	0.00	0.01	0.00	103.30
2045	0.01	0.43	0.05	0.00	0.01	0.00	103.30
2046	0.01	0.43	0.05	0.00	0.01	0.00	103.29
2047	0.01	0.43	0.05	0.00	0.01	0.00	103.29
2048	0.01	0.43	0.05	0.00	0.01	0.00	103.29
Definitions: CO = carbon monoxide NOx= nitrogen oxide PM ₁₀ = particulate matter of 10 microns PM _{2.5} = particulate matter of less than 2.5 microns ROC = reactive organic compound SOx = sulfur oxide CO _{2e} = carbon dioxide equivalent MT = metric ton							
Notes: 1. 0.00 may represents emissions that are less than 0.005.							

Table 5-16 - Short Term Mitigated Construction – Peak Year

Activity	Total Emissions (tons/year) ¹						
	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM ₁₀ ³ (tons/yr)	PM _{2.5} ³ (tons/yr)	CO _{2e} (MT/yr)
Construction Equipment Exhaust	0.83	32.48	8.92	0.06	0.09	0.09	5,460.7
Construction Offsite Mobile Exhaust	0.06	0.60	0.87	0.00	0.04	0.04	348.5
Construction Fugitive Dust	-	-	-	-	6.81	0.68	-
Drilling Equipment Exhaust	0.96	37.43	4.34	0.08	0.13	0.13	8,526.7
Drilling Offsite Mobile Exhaust	0.02	0.27	0.67	0.00	0.005	0.005	308.6
Drilling Fugitive Dust	-	-	-	-	1.49	0.15	-
Replacement Well Drilling Equipment Exhaust	0.01	0.43	0.05	0.001	0.002	0.002	98.86
Replacement Well Drilling Offsite Mobile Exhaust	0.000	0.002	0.006	0.00	0.000	0.000	2.45
Replacement Well Drilling Fugitive Dust	-	-	-	-	0.012	0.001	-
Peak Year Total ²	1.88	71.21	14.86	0.15	8.57	1.09	14,745.90
Significance Thresholds	25	NA	25	25	25	25	1,000
Significant?	No	No	No	No	No	No	Yes
Definitions:							
CO =	carbon monoxide	PM _{2.5} =	particulate matter of less than 2.5 microns				
NOx=	nitrogen oxide	ROC =	reactive organic compound				
PM ₁₀ =	particulate matter of 10 microns	SOx =	sulfur oxide				
		CO _{2e} =	carbon dioxide equivalent				
		MT =	metric ton				
Notes:							
1. Peak Year is 2019 for all Pollutants except carbon monoxide, SOx and carbon dioxide equivalent. 2024 is the Peak Year for carbon monoxide, SOx and carbon dioxide equivalent.							
2. Numbers may not add exactly due to rounding.							
3. CalEEMod does not give mitigation credit for water to unpaved road travel since the model thinks it is offsite travel, therefore, a 61percent reduction (CalEEMod default factor) of the unpaved road travel fugitive dust emissions was taken manually to account for the onsite unpaved roads being watered three times daily.							

Mitigation Measure AQ-1

- a) During construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. The Project should water exposed unpaved traffic areas two to three times per day or as needed, and with increasing frequency when wind speed exceeds 15 miles per hour. Reclaimed water should be used if available and practicable. Soil binders may be used instead of water if practical. The amount of disturbed area will be minimized. Vehicle speeds on unpaved roads will be limited to 15 miles per hour or less. If stockpiling of fill material is required, soil stockpiled for more than two days will be covered, kept moist, or treated with soil binders to mitigate dust generation. Trucks transporting fill material to and from the site will be covered with a tarp from the point of origin. Gravel pads or shakers will be installed at external access points to prevent tracking mud onto public roads. After clearing, grading, earth moving, or excavation is completed, disturbed areas will be watered, re-vegetated, or otherwise controlled to mitigate dust generation.
- b) All non-exempt portable diesel-powered construction equipment will be registered

with the state's portable equipment registration program OR will obtain a Santa Barbara County Air Pollution Control District permit. Fleet owners of mobile construction equipment are subject to the California Air Resource Board Regulation for In-use Off-road Diesel Vehicles (Title 13 California Code of Regulations, Chapter 9, § 2449), the purpose of which is to reduce diesel particulate matter and criteria pollutant emissions from in-use (existing) off-road diesel-fueled vehicles. For more information, please refer to the California Air Resources Board website at www.arb.ca.gov/msprog/ordiesel/ordiesel.htm. All commercial diesel vehicles are subject to Title 13, § 2485 of the California Code of Regulations, limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading will be limited to five minutes; electric auxiliary power units will be used whenever possible.

- c) Diesel construction and drilling equipment will meet the California Air Resources Board Tier 4 Final emission standards for off-road heavy-duty diesel engines.

Because implementation of the above described Mitigation Measure AQ-1 has been estimated to reduce Project-related construction criteria pollutant emission impacts during the peak construction year to below the County of Santa Barbara's thresholds (**Table 5-16**), implementation of the Project would therefore have *less than significant* short-term construction-related criteria pollutant impacts. No additional mitigation measures would be required for criteria pollutants from construction activities.

5.2 IMPACT AQ-2: LONG-TERM OPERATIONS EMISSIONS

Long-term emissions are caused by operational mobile sources and stationary source equipment. Mobile sources from this Project generate exhaust emissions and fugitive dust from travel on paved and unpaved roadways. Stationary sources would generate exhaust and fugitive emissions.

Mobile Source Emissions

Mobile source emissions from this Project include engine emissions from employee trips, miscellaneous truck trips, operations and maintenance on-road type vehicles, and compressed natural gas tanker truck trips traveling to and from the Project site. Emitted pollutants would include reactive organic gases, nitrogen oxides, sulfur oxides, carbon monoxide, particulate matter of 10 microns, particulate matter of less than 2.5 microns, and greenhouse gasses.

EMFAC2014 emission factors were used to estimate long-term engine emissions from employees travel, miscellaneous truck trips, and operations and maintenance on-road type vehicles. Compressed natural gas tanker truck trip emissions were calculated using a combination of manufacturer guarantees and EMFAC2014 when manufacturer guarantees were unavailable. 315 employee trips were estimated to travel a distance of 16.2 miles which is the distance to Santa Maria. Employee trips were also assumed to occur seven days a week. Gasoline fueled light-duty trucks were assumed for all employee trips using the aggregate speed and model year options in EMFAC2014. Employee trips were also assumed to occur seven days a week.

Miscellaneous truck trips, which include waste, material, and other general deliveries, will vary from day to day and year to year with a peak of 18 daily trips and 1,989 annual trips. The Project applicant provided a detailed schedule of annual trips and mileage. Diesel fueled heavy-heavy-duty trucks commonly used for commercial transport (EMFAC2014 describes this category as T7 Single) were assumed for all miscellaneous truck trips using the aggregate speed and model year options in EMFAC2014.

Operations and maintenance vehicles will be a mixture of two categories of light-heavy-duty trucks (LHDT1 and LHDT2). The Project applicant provided a detailed schedule of annual and daily mileage for operations and maintenance vehicles. The LHDT1s will have a total of 64,272 annual miles and 260 daily miles. The LHDT2s will have a total of 35,016 annual miles and 230 daily miles. Emission calculations used EMFAC2014 modeling options of 15 miles per hour vehicle speeds, diesel fuel, and a model year of 2010.

Compressed natural gas tanker truck trips will vary from day to day and year to year with a peak of 190 maximum daily trips and 68,642 annual trips. The Project applicant provided a detailed schedule of annual trips and mileage provided in **Attachment A**. Manufacturer guarantees were used to calculate emissions from the compressed natural gas tanker truck trips with 400 horsepower traveling an average speed of 55 miles per hour. When manufacturer guarantees (sulfur dioxide and suspended particulate matter up to 10 microns in diameter) were unavailable, diesel fueled heavy-heavy-duty T7 Single trucks were assumed for all tanker truck trips using the aggregate speed and model year of 3 years or newer options in EMFAC2014.

On-site Equipment Source Emissions

On-site operation and maintenance equipment source emissions from this Project include engine emissions from well servicing rigs, cranes, tractors with pumps, mud pumps, and welding generators. Emitted pollutants would include reactive organic gases, nitrogen oxides, sulfur oxides, carbon monoxide, particulate matter of 10 microns, particulate matter of less than 2.5 microns, and greenhouse gasses.

California Emissions Estimator Model was used to estimate operational emissions from on-site equipment using a specific list and schedule. The operation and maintenance schedule provided by the applicant detailed the various types and quantity of each type of equipment used along with their maximum annual operating hours. The annual operating hours were divided by 365 working days to obtain the hours per day per piece of equipment. Specific equipment horsepower was used and default load factors from California Emissions Estimator Model were utilized. Detailed equipment listings are provided in **Attachment A**.

Fugitive Dust

California Emissions Estimator Model was used to estimate short-term fugitive dust emissions from unpaved road vehicle travel. The anticipated unpaved road travel distance of five miles for each operations and maintenance vehicle was input into the California Emissions Estimator Model. Employee trips, miscellaneous truck trips, and compressed natural gas tanker truck trips will not travel on unpaved roads. Paved roads fugitive dust emissions were calculated using AP-42 emission factors and equations.

Fugitive Solvent Emissions

Material Safety Data Sheets (MSDS) were used to estimate operational fugitive emissions from usage of solvents and coatings. VOC information (concentrations and density) from possible solvents were obtained from the MSDS and used with anticipated usage rates to calculate fugitive emissions.

Stationary Source Emissions

At final build-out, the stationary source equipment that will emit criteria pollutants will consist of steam generators, flares, electrical generator, loading racks, oil storage tanks, and components which contribute fugitive emissions.

Steam Generators

High pressure steam for thermally enhanced oil recovery will be generated by seven natural gas fired once-through steam generators with low nitrogen oxide burners. In addition to use of natural gas provided by Southern California Gas Company, steam generator fuel will be supplemented with treated produced natural gas. In conformance with applicable Santa Barbara County Air Pollution Control District rules, steam generator designs will incorporate technology to meet the latest fired equipment standards for nitrogen oxides and particulate emissions.

Six 85 million British thermal units per hour steam generators will be installed at the steam generation site located in mid-field area. The primary fuel for the 85 million British thermal units per hour will be utility provided natural gas. Sweetened produced gas that would otherwise be flared may be blended with the utility provided gas and sent to these steam generators as fuel to minimize flaring when the 62.5 million British thermal units per hour steam generator is down. The 85 million British thermal units per hour steam generators will have higher emissions when fired on sweetened produced gas, however, worst case facility emissions will occur when the six 85 million British thermal units per hour steam generators and the 62.5 million British thermal unit per hour steam generator operating at the same time. Therefore, worst case emissions for the six 85 million British thermal units per hour steam generators will be based on natural gas firing.

A single 62.5 million British thermal units per hour steam generator unit will also be located at the steam generation site. This steam generator will be fired on sweetened produced gas, supplemented by utility provided natural gas.

Feedwater to these steam generators will be softened produced water pre-heated by heat integration. Steam from these units will be directed to the Project steam distribution network.

The steam generator emissions were estimated using the Santa Barbara County Air Pollution Control District's Boiler/Steam Generator Calculation Worksheet version 6.0. The following assumptions were used in the calculator:

- Steam generators are designed to operate 24 hours per day, 365 days per year.

- The 85 million British thermal units per hour steam generators will be fired primarily on utility provided quality natural gas and occasionally a mixture of utility provided gas and sweetened produced gas.
- The utility provided gas higher heating value = 1,050 British thermal units per standard cubic feet.
- The utility provided gas F-Factor = 8,578 dry standard cubic feet per million British thermal units (corrected to 60 degrees Fahrenheit). The blend of utility provided gas and sweetened produced gas is expected to have similar values.
- The utility provided gas sulfur content will have one grain per 100 standard cubic feet (16 parts per million by volume). Note: the Southern California Gas Company Rule No. 30 TRANSPORTATION OF CUSTOMER-OWNED GAS limits total sulfur in the natural gas delivered to Aera at 0.75 grains/100 standard cubic feet (12.6 parts per million). The blend of utility provided gas and sweetened produced gas is expected to comply with this standard.
- All steam generators will be equipped with a dual pass steam generator control system to ensure oxides of nitrogen do not exceed the proposed emission limits.
- Three 85 million British thermal units per hour steam generators (SG-8120, SG-8220 and SG-8320) will be installed as part of Phase I of the Project and three additional 85 million British thermal units per hour steam generators (SG-8420, SG-8520 and SG-8620) will be added as part of Phase II of the Project.
- One 62.5 million British thermal units per hour steam generator (SG-6030) will be installed as part of Phase I of the Project, and it will be used to incinerate desulfurized produced gas from the crude oil production and dehydration equipment.
- Steam generators will operate at 88% utilization by limiting the heat input.
- 85 million British thermal units per hour steam generators emission factors:

Table 5-17 - 85 Million British Thermal Units Per Hour Steam Generator Emission Factors

Pollutant	Lbs/MMBtu	Parts Per Million by Volume	Source
Oxides of nitrogen	0.0061	5 at 3 percent oxygen	Burner Manufacturer's Guarantee
Oxides of sulfur	0.00285	16	Mass Balance @ 1 gr S/100 scf ¹
PM ₁₀	0.0007		Burner Manufacturer's Guarantee
Carbon Monoxide	0.0184	25 at 3 percent oxygen	Burner Manufacturer's Guarantee
Reactive organic compounds	0.0016	4.0 at 3 percent oxygen	Burner Manufacturer's Guarantee
Definitions: PM ₁₀ = particulate matter up to 10 microns gr = grains scf = standard cubic feet lb/MMBtu = pounds per million British thermal units			

Pollutant	Lbs/MMBtu	Parts Per Million by Volume	Source
Notes: 1. See Southern California Gas Company Rule # 30 Transportation of Customer Gas (See Attachment A, Emission Calculations and Support Documents)			

- 62.5 million British thermal units per hour steam generators emission factors:

Table 5-18 - 62.5 Million British Thermal Units Per Hour Steam Generator Emission Factors

Pollutant	Lbs/MMBtu	Parts Per Million by Volume	Source
Oxides of nitrogen	0.0085	7 at 3 percent oxygen	Burner Manufacturer's Guarantee
Oxides of sulfur	0.0127	80	Estimate to account for Sulfur in produced gas ¹
PM ₁₀	0.005		Burner Manufacturer's Guarantee
Carbon Monoxide	0.0184	25 at 3 percent oxygen	Burner Manufacturer's Guarantee
Reactive organic compounds	0.0016	4.0 at 3 percent oxygen	Burner Manufacturer's Guarantee
Definitions: PM ₁₀ = particulate matter up to 10 microns Lbs/MMBtu = pounds per million British thermal units			
Notes: 1. Santa Barbara County Air Pollution Control District emission factor			

Flare

The flare is a 40 million British thermal units per hour rated air-assisted, totally enclosed emergency flare that will meet Best Available Control Technology requirements. The flare will be located at the steam generation site and will not have a visible flame or create excessive noise. Flaring of gas will be limited to a maximum of 1.5 hours per day and no more than 180 hours per year.

The flare emissions were estimated using emission factors from AP-42 and manufacturer's guarantees. The following assumptions were used in the calculations:

- The 40 million British thermal unit per hour nominal capacity flare operates only during periods of breakdown or upset where safety protocols require produced gas to be flared and the gas flow cannot be handled by the steam generators.
- The flare may be operated up to 1.5 hours per day and 180 hours per year when the steam generators are not operating or unable to combust the produced gas.
- Pilot gas flow rate to the flare will not exceed 45 standard cubic feet per hour, 8,760 hours per year.
- Maximum gas flow rate to the flares will not exceed one million standard cubic feet per day.
- The sulfur content of the gas flared will not exceed 80 parts per million by volume.
- Flare emission factors are as follows:

Table 5-19 - 40 Million British Thermal Units Per Hour Flare Emission Factors

Oxides of Nitrogen	Oxides of Sulfur	Particulate Matter Up to 10 Microns In Diameter	Carbon Monoxide	Reactive Organic Compounds ²	Carbon Dioxide Equivalents
(pounds per million British thermal units)					
0.068	0.0137	0.02	0.31	0.10	- ¹
Notes:					
1. 53.02 kilograms per million British thermal units assuming flared gas has a higher heating value of 1,050 British thermal units per standard cubic feet.					
2. The manufacturer, Aeron, has guaranteed a total hydrocarbon emission factor of 0.14 pounds per million British thermal units. Since the produced gas is expected to be mostly methane, reactive organic compound emissions are expected to be less than 0.10 pounds per million British thermal units.					

Electrical Generator

An emergency electrical generator will provide electrical power during an outage of electrical power service and will be located at the Project central processing facility. This spark ignited, internal combustion engine will be fueled by utility provided natural gas. It will generate sufficient power to operate the Project's 62.5 million British thermal units per hour steam generator, plant vapor control systems, and plant instrument air compressors. The following assumptions were used in the calculations:

- The engine is fired on utility provided gas; therefore, it is not limited by the 200 hour per year limit applied to diesel fired engines.
- The engine is equipped with a non-selective catalytic control system.
- The engine will operate during power outages for no more than 600 hours per year.
- Greenhouse gas emissions are based on the California Air Resources Board approved emission factors and calculation procedures.
- Applicant is proposing to operate the emergency electrical generator in compliance with previously approved emission factors for this type of equipment as shown below which include the use of catalytic control systems:

Table 5-20 - Internal Combustion Engine Emission Factors

Pollutant	Grams Per Horse-Power Hour	Parts Per Million by Volume	Source
Oxides of nitrogen	0.069	5 at 15 percent oxygen	Manufacturer's Guarantee
Oxides of sulfur	0.006	80	Mass Balance at 0.88 grain per 100 standard cubic feet
Particulate matter up to 10 microns	0.003		Applicant Proposed
Carbon Monoxide	0.209		Manufacturer's Guarantee
Reactive organic compounds	0.048		Manufacturer's Guarantee
Notes:			
These emission factors represent the expected post catalytic control emission factors and not the uncontrolled engine emission guarantees in Attachment A, Emission Calculations and Support Documents. Pre-construction submittal of engine and catalytic control system manufacturer design specifications and emission guarantees will be required by permit condition.			

Loading Racks

The loading rack emissions were estimated using the Santa Barbara County Air Pollution Control District's Loading Rack Emissions Calculator version 3.0. The following assumptions were used in the calculator:

- Facility operates 24 hours per day, 365 days per year.
- Emissions from unloading light crude oil into the light crude oil storage tanks is accounted for in the storage tank emission calculations; therefore, a truck unloading emission calculation has not been added.
- Light crude oil deliveries will be 1,666 barrels per day for Phase I and 3,000 barrels per day for Phase II operations. Tank missions are based on a maximum daily throughput for each tank of 3,000 barrels per day.
- The maximum heavy crude oil truck loading from each 10,000 barrel storage tank will be 10,000 barrels per day for Phase I and for Phase II operations. Phase I will include one storage tank, a second storage tank will be added in Phase II, for a total maximum truck loading of 20,000 Barrels per day at full build out in Phase II.
- The crude oil loading temperature is 200 degrees Fahrenheit with a molecular weight of 50 pounds per pound-mole and a true vapor pressure of 0.50 pounds per square inch.
- Each loading rack will utilize submerged loading dedicated normal service vessels and each loading rack will be able to load two tanker trucks at a time.
- Truck loading emissions for the blended crude oil are calculated using the Santa Barbara County Air Pollution Control District Loading Rack Emissions calculator with the preceding throughput and the heavy crude oil storage tank liquid parameters.
- Greenhouse gas emissions are calculated assuming that all reactive organic compound emissions are methane and applying the state approved Global Warming Potential factor of one ton methane equals 21 tons of carbon dioxide equivalent.
- Submerged loading: Dedicated vapor balance service (Saturation Factor 0.60).
- Vapor recovery efficiency = 0.95.

Oil Storage Tanks

Oil storage tanks would be installed at the facility in various sizes for various operational functions. The storage tank emissions were estimated using the Santa Barbara County Air Pollution Control District's worksheet Fixed Roof Calculation (AP-42: Chapter 7 Method). The following assumptions were used in the worksheet:

- Facility operates 24 hours per day, 365 days per year.
- Two – 6,500 barrels light crude oil storage tanks T- 2040 and 2050 each with a maximum daily throughput of 3,000 barrels per day and 729,000 barrels per year with a true vapor pressure of 1.57 pounds per square inch at 60 degrees Fahrenheit.
- Two -10,000 barrels heavy crude oil storage tanks T-2170 and 2180 each with a maximum daily throughput of 10,140, barrels per day and 2,961,000 barrels per year with a true vapor pressure of 0.50 pounds per square inch at 200 degrees Fahrenheit.

- Two - 1,000 barrels capacity sludge tanks T-7030 and 7140 with an expected maximum throughput of 803 barrels per day and 234,000 barrels per year with a true vapor pressure of 0.50 pounds per square inch at 180 degrees Fahrenheit.
- Two - 1,000 barrels capacity skim oil tanks T-7070 and 7180 with an expected maximum throughput of 2,922 barrels per day and 853,224 barrels per year with a true vapor pressure of 0.50 pounds per square inch at 180 degrees Fahrenheit.
- Two 100 barrels capacity drain T-9560 and 9600 with an expected maximum throughput of 50 barrels per day and 18,250 barrels per year with a true vapor pressure of 0.50 pounds per square inch at 180 degrees Fahrenheit.
- All storage tanks will be served by the facility vapor recovery system with a short term vapor control efficiency of 95 percent and 95 percent long term vapor collection efficiency.
- Greenhouse gas emissions are calculated assuming that all reactive organic compound emissions are methane and applying the state approved Global Warming Potential factor of one ton methane equals 21 tons of carbon dioxide equivalent.

Fugitive Leaks

Emissions would also occur from fugitive leaks from equipment components. The fugitive leak emissions were calculated in a worksheet using the Component Leak Path Methodology. The following assumptions were used in the worksheet:

- Expected emissions are calculated using Santa Barbara County Air Pollution Control District component leak path methodology equations based on a Rule 331 fugitive leak inspection program.
- The facility will be designed and built to comply with the District's Rule 331 Best Available Control Technology standards as found in Air Pollution Control District Form-31.
- Greenhouse gas emissions are based solely on the methane fraction of the produced gas and applying the state approved Global Warming Potential factor of one ton methane equals 21 tons of carbon dioxide equivalent.
- Reactive organic compounds/Total Hydrocarbon ratio is 31 percent per Table 2 of the Santa Barbara County Air Pollution Control District Policy 6100.061.1998.
- Estimated Facility Component Counts:

Table 5-21 - Facility Component Counts

	Valves	Others	Connectors	Flanges	Compressors	Pumps
Phase I						
Gas	1,127	47	2,463	2,025	2	0
Liquid	4,721	15	4,322	6,982	0	49
Phase II						
Gas	772	44	1,594	1,364	2	3
Liquid	4,084	13	3,036	5,864	0	32

Projected Emissions

Table 5-22 presents the project's long-term unmitigated emissions based on the anticipated operational peak year. Calculation and summary spreadsheets are available in **Attachment A**.

Table 5-22 - Long Term Unmitigated Operational Emissions – Peak Year

Activity	Total Emissions ¹						
	ROC	CO	NOx	SOx	PM ₁₀	PM _{2.5}	CO _{2e}
	(lbs/day)	(lbs/day)	(lbs/day)	(lbs/day)	(lbs/day)	(lbs/day)	(MT/yr)
Offsite: Mobile (Non-Tankers)	0.72	8.45	16.67	0.15	1.46	0.59	1,059.5
Offsite: Mobile Tankers	4.99	6,630	7.65	0.82	4.28	4.28	14,126.1
Operation and Maintenance	4.59	35.92	36.70	0.19	0.49	0.47	2,769.03
Stationary Equipment	75.83	284.03	94.92	55.07	17.46	17.46	235,111.1
Solvents and Coatings	2.65	-	-	-	-	-	-
Paved Roads Fugitive Dust Emissions	-	-	-	-	33.95	8.33	-
Unpaved Roads Fugitive Dust Emissions	-	-	-	-	117.77	11.76	-
Indirect Electrical Generation	-	-	-	-	-	-	30,698.3
Peak Year Total ²	88.78	6,953.51	155.94	56.21	175.40	42.91	283,764.1
Significance Thresholds	55	NA	55	NA	80	NA	1,000
Significant?	Yes	No	Yes	No	Yes	No	Yes
Mobile Exhaust Only Significance Threshold	25	NA	25	NA	NA	NA	NA
Significant?	No	No	Yes	No	No	No	No
Definitions:							
CO =	carbon monoxide	ROC =	reactive organic compound				
NOx=	nitrogen oxide	SOx =	sulfur oxide				
PM ₁₀ =	particulate matter of 10 microns	CO _{2e} =	carbon dioxide equivalent				
PM _{2.5} =	particulate matter of less than 2.5 microns	MT =	metric ton				
		lbs =	pounds				
Notes:							
1. Peak Year is based on a Pollutant by Pollutant basis.							
2. Numbers may not add exactly due to rounding.							

As calculated, long-term unmitigated emissions are predicted to *exceed* Santa Barbara County Air Pollution Control District and Santa Barbara County significance threshold levels for nitrogen oxides, reactive organic compounds, particulate matter of ten microns and carbon dioxide equivalencies. Therefore, according to the California Environmental Quality Act, all feasible mitigation needs to be applied to the project in an effort to bring the project to a less than significant level.

The applicant has no authority over employee vehicles and miscellaneous truck trips coming to and from the Project site, therefore, no mitigation to these emissions are feasible. The tanker trucks are fueled by compressed natural gas by Project design, therefore, no further mitigation is feasible and are reduced to the greatest extent. Fugitive dust emissions will be mitigated with water suppression and reduced vehicle speeds in accordance with Mitigation Measure AQ-2a below. Operation and Maintenance equipment will meet the California Air Resources Board Tier 4 Final emission standards for off-road heavy-duty diesel engines in accordance with

Mitigation Measure AQ-2c below. Greenhouse Gas emissions and mitigation measures are further discussed in **Section 7.0**.

The steam generators will operate with a limited heat input which will allow them to operate at a maximum of 88% utilization by Project design in order to reduce criteria and greenhouse gas emissions as much as possible. All stationary source emissions will be in compliance with Santa Barbara County Air Pollution Control District Rules and Regulations which also requires best available control technology; therefore, all feasible mitigation has already been applied. However, offsets for stationary source emissions will be required. Mitigation Measure AQ-2b, below, will be implemented and the nitrogen oxide and reactive organic compound emissions will be offset as shown in **Table 5-23**. As shown in **Table 5-23**, with implementation of Mitigation Measures AQ-2a, AQ-2b, and AQ-2c, long-term emissions would be reduced to a less than significant level for nitrogen oxide and particulate matter of 10 microns.

Table 5-23 - Long Term Operational Emissions after Mitigation – Peak Year

Activity	Total Emissions ¹						
	ROC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM ₁₀ (lbs/day)	PM _{2.5} (lbs/day)	CO _{2e} (MT/year)
Total Project							
Offsite: Mobile (Non-Tankers)	0.72	8.45	16.67	0.15	1.46	0.59	1,059.5
Offsite: Mobile Tankers	4.99	6,630	7.65	0.82	4.28	4.28	14,126.1
Operation and Maintenance	2.01	63.87	7.88	0.18	0.26	0.23	2,769.02
Stationary Equipment	75.83	284.03	94.92	55.07	17.46	17.46	235,111.1
Solvents and Coatings	2.65	-	-	-	-	-	-
Paved Roads Fugitive Dust Emissions	-	-	-	-	33.95	8.33	-
Unpaved Roads Fugitive Dust Emissions	-	-	-	-	5.63	0.56	-
Stationary Source Offsets ³	-31.21	-	-72.14	-	-	-	-
Indirect Electrical Generation	-	-	-	-	-	-	30,698.3
Peak Year Total²	54.99	6,985.90	54.99	56.23	63.03	31.45	283,764.1
Significance Thresholds	55	NA	55	NA	80	NA	1,000
Phase II Significant?	No	No	Yes	No	No	No	Yes
Motor Vehicle Trips Exhaust Only							
Offsite: Mobile (Non-Tankers)	0.72	8.45	16.67	0.15	1.46	0.59	1,059.5
Offsite: Mobile Tankers	4.99	6,630	7.65	0.82	4.28	4.28	14,126.1
Operation and Maintenance	0.32	1.73	0.54	0.01	0.03	0.03	82.31
Peak Year Total²	6.03	6,640	24.86	0.98	5.77	4.90	15,267.9
Mobile Exhaust Only Significance Threshold	25	NA	25	NA	NA	NA	NA
Significant?	No	No	No	No	No	No	No
Definitions:							
CO = carbon monoxide	ROC = reactive organic compound						
NOx= nitrogen oxide	SOx = sulfur oxide						
PM ₁₀ = particulate matter of 10 microns	CO _{2e} = carbon dioxide equivalent						
PM _{2.5} = particulate matter of less than 2.5 microns	MT = metric ton						
	lbs = pounds						
Notes:							
1. Peak Year is based on a Pollutant by Pollutant basis. NOx peak year is 2028 and all other pollutants peak year is 2031.							
2. Numbers may not add exactly due to rounding.							
3. Stationary Source nitrogen oxide and reactive organic compounds emissions offsets will be purchased in order to mitigate emissions to less than significant or to the greatest extent possible if less than significance cannot be achieved.							

Source: Insight Environmental Consultants 2017

Mitigation Measure AQ-2

- a) During operations, use of water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. The Project should water exposed unpaved traffic areas three times per day unless conditions do not warrant such frequency (e.g. during rainy conditions, when the soil is otherwise moist, or when soil stabilizers are effectively eliminating the need for water applications in order to control dust), and with increasing frequency when wind speed exceeds 15 miles per hour. Reclaimed water should be used if available and practicable. Apply soil stabilizers once per month unless conditions do not warrant such frequency (e.g. when previously applied soil stabilizers are continuing to work effectively to control dust). The amount of disturbed area will be minimized. Vehicle speeds on unpaved roads will be limited to 15 miles per hour or less.
- b) In accordance with Santa Barbara County and Santa Barbara County Air Pollution Control District requirements, Aera will provide the required emission reduction credits for stationary source pollutants.
- c) Operation and Maintenance equipment will meet the California Air Resources Board Tier 4 Final emission standards for off-road heavy-duty diesel engines
- d) Emissions will be mitigated to less than significant or to the greatest extent feasible, if less than significant cannot be achieved.

The Project's long-term operational emissions, with the application of Mitigation Measure AQ-2, will not exceed the significance thresholds. Therefore, this Project has mitigated long-term emissions to the greatest extent feasible and will have *less than significant* long-term operational-related impacts.

5.3 POTENTIAL ODOR IMPACTS

This Project has potential to create odor impacts. Odor thresholds are defined as the point at which a person can detect the substance by smell. According to the American Industrial Hygiene Association, the odor detection threshold is the lowest concentration of odorant that will elicit a sensory response in the olfactory receptors of a specified percentage of a given population (American Industrial Hygiene Association 1989). The annoyance level would be a higher concentration.

Based on a review of surrounding land uses and existing area development, odors from the proposed Project are not expected to significantly impact receptors. As shown in **Figure 5-1** below, there are 48 known residential receptors, a winery tasting room, and an office within one mile of the Project's property boundary. The closest residential receptors to the central processing plant are located 0.40 miles to the south and 1.27 miles to the southeast.

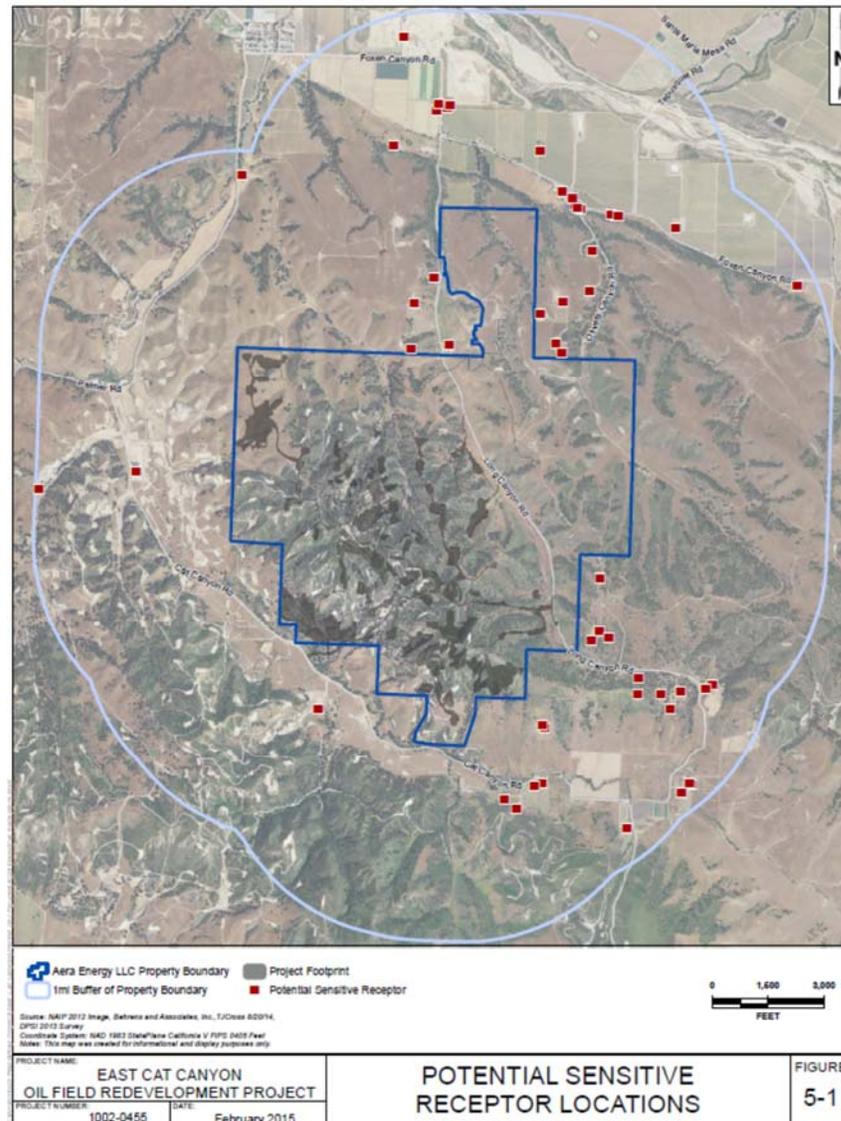


Figure 5-1 - Potential Sensitive Receptor Locations

Odor events could occur due to several different situations associated with equipment or drilling upset conditions. The equipment components could also leak and cause odors. Tanks are equipped with hatches to protect them from overpressure. If these hatches lift, due to a failure of the vapor recovery compressor, for example, odor events could occur. During drilling operations, pockets of gas can be encountered, which can be picked up by the circulating muds, brought to the surface, and released through the mud processing system.

The release of material that contains even small amounts of sulfur compounds or hydrocarbons produces an odor. Sulfur compounds, found in oil and gas, have very low odor threshold levels.

Mitigation Measure AQ-3a

- a) In order to mitigate odor releases from tanks due to hatch release, Aera will set up the vapor recovery system to notify the operator when the tank pressure is within ten

percent of the tank relief pressure. Additionally, personal hydrogen sulfide monitors and wind socks that will be deployed onsite for employee safety will further mitigate the risk of objectionable odors leaving the Project site.

- b) Aera will develop an Odor Minimization Plan which will address potential odors from oil field equipment and measures to reduce or eliminate these odors. The Plan will address issues such as facility information, buffer zones, signs with contact information, logs of odor complaints, protocol for handling odor complaints and odor event investigation and methods instituted to prevent re-occurrence.

Implementing these mitigation measures would reduce the potential likelihood and consequence of odor events. Although odor events could still occur, Project Measures would most likely reduce the impacts from odors to less than significant.

5.4 PREDICTED HEALTH RISK IMPACTS

According to Santa Barbara County Air Pollution Control District Modeling Guidelines for Health Risk Assessments (SBCAPCD 2015) a Health Risk Assessment must be completed for any of the following situations:

1. The District has determined that a Health Risk Assessment is necessary as part of the District's New Source Review permitting program.
2. A Health Risk Assessment is necessary as part of the California Environmental Quality Act process.
3. The District has determined that a Health Risk Assessment is necessary as part of the District's evaluation of the facility in the AB2588 Air Toxics "Hot Spots" program.

According to the above criteria a Health Risk Assessment is necessary for the proposed Project. The Santa Barbara County Air Pollution Control District reviewed the Health Risk Assessment that Aera submitted for this Project on July 24, 2017. Based on this review the Santa Barbara County Air Pollution Control District completed a Health Risk Assessment with some revisions. The changes associated with this revision of the Air Quality Impact Analysis which include a revised operational timeline and the replacement of diesel tankers with Compressed Natural Gas tankers will only reduce health risk. Therefore, the health risk completed by the Santa Barbara County Air Pollution Control District will not be revised and is included in **Attachment C**. Details of the Health Risk Assessment are outlined herein.

Facility Information

The East Cat Canyon Oil Field Redevelopment Project will be located at 6516 East Cat Canyon Road in Santa Maria, California. **Figure C-4 of Attachment C** displays the Universal Transverse Mercator coordinates for 25 locations along the Project boundary. The Universal Transverse Mercator coordinates utilize the WGS84 Zone 10 North datum.

The Health Risk Assessment included 46 toxic substances. A listing of the Project's sources including the AERMOD source identification and hourly and annual emissions of each pollutant for each source may be found under *Aera East CC Toxics Emissions*

Summary_Revised by APCD.xlsx and Aera East CC Permit-Exempt Toxics Emissions for CEQA.xlsx located in the *Aera_CEQA_AQIAandHRA.zip* file.

Source Information

The Health Risk Assessment consisted of three types of source releases, point sources, line sources and volume sources. Point source releases were used for steam generator stacks, emergency generator stack, flare stack, and tank vents. Stack parameters for steam generators, emergency generators, and flare stacks were taken from manufacturer specifications (Attachment E, Equipment Specifications). Tank vent and release parameters were input according to Santa Barbara County Air Pollution Control District's Health Risk Assessment modeling guideline's (SBCAPCD 2015) Appendix B. Volume source releases were used for fugitive component leaks, solvent usage, drilling emissions, and operation and maintenance equipment and vehicle emissions. The area of the volume sources were estimated to cover the anticipated area that components, solvent usage, equipment and vehicles will be located. Some areas were represented by multiple smaller volume sources to best cover the anticipated areas of possible leaks since volume sources cannot be angled or modeled as poly-volume sources in AERMOD. Gas service components and oil service components have different average release heights in several modeled areas, therefore, gas service and oil service components were modeled as separate sources in these areas. All components located in the group station and steam generator sites were conservatively modeled using the same release height. The line sources were used for onsite tanker truck travel and off-site travel up to 1,000 feet from the property boundary for tanker trucks as well as equipment and vehicles associated with drilling, operations and maintenance. Line sources were mapped according to estimated travel routes. All sources including their AERMOD identification ID, release type, Universal Transverse Mercator coordinates (WGS84 Zone 10 North), and release parameters may be found under *Aera East CC Toxics Emissions Summary_Revised by APCD.xlsx* and *Aera East CC Permit-Exempt Toxics Emissions for CEQA.xlsx* located in the *Aera_CEQA_AQIAandHRA.zip* file.

The facility operates 24 hours a day and seven days per week; therefore, all equipment is assumed to operate the same hours as the facility with the exception of emergency equipment. **Table 5-24** below describes the operating schedule of the emergency equipment.

Table 5-24 - Operating Schedule for Flare and Emergency Generator

Source	AERMOD ID	Hours/day	Hours/Year	Days/Week	Weeks/Year
Flare	STCK16	1.5	180	Varies	Varies
Emergency Generator	STCK14	24	600	Varies	Varies

Emission Quantification

Emissions were quantified for the Project's toxic substances that are identified as having a cancer or non-cancer acute or chronic risk on the California Air Resources Board's Consolidated Table of Office of Environmental Health Hazard Assessment/Air Resources Board Approved Risk Assessment Health Values (CARB 2015).

Steam generator and flare toxic emissions were calculated using speciation emission factors from the Ventura County Air Pollution Control District (VCAPCD 2001) and emission factors from AP-42. Fugitive leak emissions from components, tanks, and loading racks were calculated using California Air Resources Board's speciation profiles and Project specific hydrogen sulfide concentrations. Toxic solvent emissions were calculated using product specific material safety data sheets. Internal combustion emissions were calculated using emission factors from AP-42. Diesel particulate matter emissions were calculated using EMFAC2014 and the California Emissions Estimator Model for on-site and off-site equipment and vehicles. The Project's toxic emission calculations may be found under *Aera East CC Toxics Emissions Summary_Revised by APCD.xlsx* and *Aera East CC Permit-Exempt Toxics Emissions for CEQA.xlsx* located in the *Aera_CEQA_AQIAandHRA.zip* file.

Meteorological Data

The meteorological data utilized in the Health Risk Assessment was obtained from the Santa Barbara County Air Pollution Control District's website. The Santa Maria Airport meteorological data was used as it was closest to the Project site and a better representation to the meteorological conditions in the Project area. The Santa Maria Airport meteorological data includes the years from 2010-2014.

Air Dispersion Model

The most recent version of Environmental Protection Agency's AMS/EPA Regulatory Model - AERMOD (recompiled for the Lakes ISC-AERMOD View interface version AERMOD_16216R) was used to predict the dispersion of emissions from the Project. Regulatory default options were selected using rural dispersion and elevated terrain. Building Profile Input Program was run to calculate building downwash for stacks near buildings and tanks. Dimensions and Universal Transverse Mercator coordinates (WGS84 Zone 10 North) for all structures included in the calculations for building downwash are listed in *TABLE I-11: Structure Parameters Used to Calculate Building Downwash* of the file *AAQA Tables ATC_03062016 (Revised by APCD).xlsx*. These files are located in the *Aera_CEQA_AQIAandHRA.zip* file.

Receptors

A total of 5,204 receptors were analyzed for the Health Risk Assessment which included 620 property boundary receptors, 48 residential receptors, four worker receptors, 33 road receptors, and grid receptors. Grid receptor spacing was selected according to Santa Barbara County Air Pollution Control District's Modeling Guidance Section 2.8.3 which states "For facilities with very large property boundaries (e.g., oil and gas leases), the grid spacing must be no greater than 100 meters apart." Section 2.8.3 also states "The grid shall extend at least two kilometers from the property boundary for all property sizes." The grid was constructed using a "fence-line grid" with fence-line spacing of 100 meters and one tier of receptors extending out two kilometers with tier spacing of 100 meters.

Property boundary receptor spacing was selected according to Santa Barbara County Air Pollution Control District's Modeling Guidance Section 2.8.4 which states "For larger

facilities, like oil and gas leases, a spacing of 50-100 meters is more practical.” However, property boundary receptor spacing of 25 meters was selected. All receptors were modeled with a flagpole height of 1.5 meters.

There are no sensitive receptors such as schools, daycare facilities, hospitals, or care facilities located within two kilometers of the project site. However, Benjamin Foxen Elementary School is located approximately 2,100 meters from the Project boundary. The Sisquoc residential neighborhood is located adjacent to the elementary school. Therefore, a 25 meter grid which included 750 grid receptors was placed over the elementary school and residential neighborhood.

The public will not have access to roadways on the Project site. Therefore, no onsite receptors were modeled for acute risk. The road receptors are for an offsite roadway. Receptors were placed on this roadway as a conservative measure to analyze acute risk on the section of roadway nearest to the Project’s central processing plant. There were not any pathway receptors modeled, however, multi-pathway analysis was conducted for all modeled receptors.

Receptor 140 was determined to be the worst case receptor for the beef multi-pathway, therefore, it was used for the worst case pasture receptor during the second model run. Pathway receptors are typically modeled with no flagpole height; however, receptor 140 was modeled with a 1.5 meter flagpole height which would be more conservative than a zero flagpole height. All grid and receptor data may be found in the file *Aera_CEQA_HRA.ADO* located in the *Aera_CEQA_AQIAandHRA.zip* file.

Multi-pathway and Exposure Parameters

In order to be conservative, all receptors were modeled as multi-pathway receptors. Pathways that were evaluated for the Health Risk Assessment included inhalation, soil, dermal, mother’s milk, homegrown produce, beef, chickens and eggs. Pathway and exposure parameters included in the Health Risk Assessment are:

Deposition Rate - A deposition rate must be used when determining potential multi-pathway health impacts. A deposition rate of 0.05 meters per second was selected as there are no verifiable particulate matter control devices in place at the Project.

Inhalation – The inhalation pathway was included in the Health Risk Assessment. Fraction of time at home options were not selected in the initial cancer risk analysis. Due to the presence of Benjamin Foxen Elementary School the fraction of time at home values were selected only for ages over 16 years in the Santa Barbara County Air Pollution Control District’s final risk analysis.

Soil Ingestion – The soil ingestion pathway was included in the Health Risk Assessment. There are no other parameters selected for soil ingestion pathway.

Dermal – The dermal pathway was included in the Health Risk Assessment. Santa Barbara County Air Pollution Control District’s modeling guidance instructed modelers to select warm

climate for any projects located in Santa Barbara County; therefore, warm climate was selected for this Project.

Mother's Milk – The mother's milk pathway was included in the Health Risk Assessment. There are no other parameters selected for the mother's milk pathway.

Drinking Water - The drinking water pathway was not included in the Health Risk Assessment because there are not any residential receptors with a pond or other water source that is used for human drinking water within the isopleths of one per million for cancer risk or a hazard index of 0.1 for chronic non-cancer risk.

Fish – The fish pathway was not included in the Health Risk Assessment because there are not any residential receptors with a fish pond or lake within the isopleths of one per million for cancer risk or a hazard index of 0.1 for chronic non-cancer risk.

Homegrown Produce – The homegrown produce pathway was included in the Health Risk Assessment. The HARP2 default fractions for households that garden were selected.

Beef – The beef pathway was not included in the initial cancer risk analysis. However, since cattle grazing pastures could be located anywhere near the facility and the Project has an isopleth of at least one per million for cancer risk; the beef pathway was included in the reanalyzed cancer risk analysis. Receptor 140 was determined to be the worst case receptor for the beef multi-pathway, therefore, it was used for the worst case pasture receptor during the second model run. The HARP2 default fractions for the fraction of human diet from contaminated source for households that raise/hunt were selected. Office of Environmental Health Hazard Assessment's default of 0.5 was used for the grazing fraction from a contaminated source. The fraction of beef cows drinking water from contaminated sources was set to zero since there are no surface water sources of drinking water for the animals, such as springs, ponds, or lakes.

Dairy – The dairy pathway was not included in the Health Risk Assessment because there were not any dairy pastures within the isopleths of one per million for cancer risk or a hazard index of 0.1 for chronic non-cancer risk of the initial Health Risk Assessment run.

Pig - The pig pathway was not included in the Health Risk Assessment because there were not any pig farms within the isopleths of one per million for cancer risk or a hazard index of 0.1 for chronic non-cancer risk.

Chickens, and Egg – The chicken and egg pathways were included in the Health Risk Assessment. The HARP2 default fractions for the fraction of human diet from contaminated source for households that raise/hunt were selected. The default fractions for animal diets that are recommended by Office of Environmental Health Hazard Assessment were selected. The fraction of chickens and eggs drinking water from contaminated sources was set to zero because there are not any surface water sources such as ponds, springs, or lakes.

Health Values and HARP Version

The newest version of the HARP2 – Air Dispersion and Risk Tool dated 17052 was used for the Health Risk Assessment. The pollutant health information database used in the Health Risk Assessment was dated 17052.

Risk Scenarios

Cancer Risk

The cancer risk for the maximally exposed individual resident, the point of maximum impact and the maximally exposed individual worker were evaluated for the Health Risk Assessment. HARP2 post processing method was used to calculate the maximally exposed individual worker and no adjustment factor was used. **Table 5-25** below shows how the risk values were calculated.

Table 5-25 - Required Cancer Risk Scenarios

Receptors	HARP Receptor Type	HARP Exposure Duration	HARP Intake Rate Percentile
PMI	Individual Resident	30 Year	RMP using the Derived Method
Residential Receptors	Individual Resident	30 Year	RMP using the Derived Method
Worker Receptors	Worker	25 Year (Worker)	OEHHA Derived Method
Definitions: HARP = Hotspots Analysis Reporting Program PMI = Point of Maximum Impact RMP = Risk Management Policy OEHHA = Office of Environmental Health Hazard Assessment			
Note – Sensitive Receptors were not analyzed because there were not any located within two kilometers of the Project site or within the one per million cancer risk isopleth.			

Non-Cancer Risk

The non-cancer chronic and acute risks for the point of maximum impact, maximally exposed individual resident, and maximally exposed individual worker were evaluated using the Office of Environmental Health Hazard Assessment Derived Method. HARP2 post processing was used to calculate the maximally exposed individual worker and no adjustment factor was used. Acute risk calculated for this Project was calculated as simple acute risk.

An 8-hour chronic risk was required to be evaluated for the maximally exposed individual worker, additionally, the point of maximum impact and maximally exposed individual resident were also evaluated. The HARP2 post processing method was used to calculate the 8-hour chronic risk and no adjustment factor was used.

Health Risk Results

The results for the Health Risk Assessment are included in **Tables 5-26 through 5-29** below.

Table 5-26 - Summary of Maximum Cancer Health Risk Impacts

Receptor	Cancer Risk (in a million)	Significance Threshold	Receptor Number	UTME (meters)	UTMN (meters)
Offsite PMI	335.20	N/A	4873	748151.04	3856563.23
MEIR	9.12	≥ 10	3751	749982.5	3855986.39
MEIW	1.41	≥ 10	1828	748368.06	3856277.37
Definitions:					
PMI =	Point of Maximum Impact		UTME =	Universal Transverse Mercator Easting Coordinate (World Geodetic System 1984 Zone 10 North)	
MEIR =	Maximally Exposed Individual Resident		UTMN =	Universal Transverse Mercator Northing Coordinate (World Geodetic System 1984 Zone 10 North)	
MEIW =	Maximally Exposed Individual Worker				
Notes: Cancer Risk results are the results of the reanalyzed cancer risk which included fraction of time at home options selected and beef pathway included.					

The cancer health risk impacts in **Table 5-26** above shows that the significance threshold for maximally exposed individual resident and maximally exposed individual worker will not be exceeded. There is no significance threshold for cancer risk at the point of maximum impact.

Table 5-27 - Summary of Maximum Chronic Non-Cancer Health Risk Impacts

Receptor	Chronic HI	Significance Threshold	Receptor Number	UTME (meters)	UTMN (meters)
Offsite PMI	1.824	N/A	4873	748151.04	3856563.23
MEIR	0.074	> 1	3751	749982.5	3855986.39
MEIW	0.050	> 1	1828	748368.06	3856277.37
Definitions:					
PMI =	Point of Maximum Impact		UTME =	Universal Transverse Mercator Easting Coordinate (World Geodetic System 1984 Zone 10 North)	
MEIR =	Maximally Exposed Individual Resident		UTMN =	Universal Transverse Mercator Northing Coordinate (World Geodetic System 1984 Zone 10 North)	
MEIW =	Maximally Exposed Individual Worker				
HI =	Hazard Index				

The chronic non-cancer health risk impacts in **Table 5-27** above shows that the significance threshold for maximally exposed individual resident and maximally exposed individual worker will not be exceeded. There is no significance threshold for chronic non-cancer risk at the point of maximum impact.

Table 5-28 - Summary of Maximum Acute Non-Cancer Health Risk Impacts

Receptor	Acute HI	Significance Threshold	Receptor Number	UTME (meters)	UTMN (meters)
Offsite PMI	0.611	> 1	4910	747786.23	3857177.75
MEIR	0.145	> 1	1873	748126.83	3856096.44
MEIW	0.204	> 1	1818	748938.93	3856074.23
Definitions:					
PMI =	Point of Maximum Impact		UTME =	Universal Transverse Mercator Easting Coordinate (World Geodetic System 1984 Zone 10 North)	
MEIR =	Maximally Exposed Individual Resident		UTMN =	Universal Transverse Mercator Northing Coordinate (World Geodetic System 1984 Zone 10 North)	
MEIW =	Maximally Exposed Individual Worker				
HI =	Hazard Index				

The acute non-cancer health risk impacts in **Table 5-28** above shows that the significance threshold for point of maximum impact, maximally exposed individual resident, and maximally exposed individual worker will not be exceeded.

Table 5-29 - Summary of Maximum 8-Hour Chronic Non-Cancer Health Risk Impacts

Receptor	8-Hour Chronic HI	Significance Threshold	Receptor Number	UTME (meters)	UTMN (meters)
Offsite PMI	0.084	N/A	4871	748199.67	3856564.06
MEIW	0.015	> 1	1828	748368.06	3856277.37
Definitions:					
PMI =	Point of Maximum Impact	UTME =	Universal Transverse Mercator Easting Coordinate (World Geodetic System 1984 Zone 10 North)		
MEIR =	Maximally Exposed Individual Resident	UTMN =	Universal Transverse Mercator Northing Coordinate (World Geodetic System 1984 Zone 10 North)		
MEIW =	Maximally Exposed Individual Worker				
HI =	Hazard Index				

The 8-hour chronic non-cancer health risk impacts in **Table 5-29** above shows that the significance threshold for maximally exposed individual resident and maximally exposed individual worker will not be exceeded. There is no significance threshold for 8-hour chronic non-cancer risk at the point of maximum impact.

Risk Drivers

The highest risk driver for the point of maximum impact, maximally exposed individual resident, and maximally exposed individual worker for cancer, chronic, 8-hour chronic and acute risk are listed in **Table 5-30**. Risk drivers were determined by which pollutant contributed to the greatest risk for the total cancer risk or the highest risk index for chronic, 8-hour chronic and acute risk. Risk drivers are also summarized in *Tables 10.1-1 through 10.4-3 of the Santa Barbara County Air Pollution Control District’s Health Risk Assessment*.

Table 5-30 - Risk Drivers

Receptor	Cancer Risk	Chronic Risk	8-Hour Chronic Risk	Acute Risk
Offsite PMI	Epichlorohydrin	Epichlorohydrin	Benzene	Acrolein
MEIR	DPM	Arsenic	-	Benzene
MEIW	DPM	Epichlorohydrin	Benzene	Acrolien
Definitions:				
PMI =	Point of Maximum Impact			
MEIR =	Maximally Exposed Individual Resident			
MEIW =	Maximally Exposed Individual Worker			
DPM =	Diesel Particulate Matter			

Maps and Aerial Photos

The following maps and aerial photos are included in **Attachment C**:

- Building (Figure C-1)
- Emission Sources (Figures C-2 and C-3)

- Project Boundary Coordinate Points (Figure C-4)
- Health Risk Assessment Attachments
 - A1 – Residential Cancer Risk Isopleth: Entire Stationary Source View
 - A2 – Residential Cancer Risk Isopleth: Magnified View
 - B1 – Residential Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
 - B2 – Residential Chronic Non-Cancer Risk Isopleth: Magnified View of PMI and MEIR
 - B3 – Residential Chronic Non-Cancer Risk Isopleth: Magnified View of 1.0 Hazard Index Isopleth
 - C1 – Worker Cancer Risk Isopleth: Entire Stationary Source View
 - C2 – Worker Cancer Risk Isopleth: Magnified View
 - D1 – Worker Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
 - D2 – Worker Chronic Non-Cancer Risk Isopleth: Magnified View
 - E1 – Worker 8-Hour Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
 - E2 – Worker 8-Hour Chronic Non-Cancer Risk Isopleth: Magnified View
 - F – Acute Non-Cancer Risk Isopleth

Significance Finding

The potential health risk attributable to the Project is determined to be less than significant based on the following conclusions:

1. Potential carcinogenic risk from the Project is *below* the significance level of ten in a million cancer risk; and
2. The hazard index for the potential chronic and acute non-cancer risks from the Project is *below* the significance level of 1.0 at each of the modeled receptors.

5.5 IMPACTS TO THE AMBIENT AIR QUALITY

Since the Project will result in an increase of criteria pollutant emissions, dispersion modeling was conducted to analyze the Project impacts.

The Santa Barbara County Air Pollution Control District reviewed the Ambient Air Quality Assessment that Aera submitted for this Project on July 24, 2017. Based on this review the Santa Barbara County Air Pollution Control District completed an Ambient Air Quality Assessment with some revisions. The changes associated with this revision of the Air Quality Impact Analysis include a revised operational timeline, replacement of diesel tanker with Compressed Natural Gas tankers, revised particulate matter emission factors for the steam generators based on updated manufacture guarantees, adding paved road travel fugitive particulate matter emissions, and correcting previously calculated fugitive particulate matter emissions for unpaved road travel will actually be paved road travel. These changes will reduce all criteria pollutant emissions except for carbon monoxide. Carbon monoxide emissions will increase; however, the ambient concentrations for carbon monoxide are substantially lower than any ambient air quality significance threshold; therefore, the increase to carbon monoxide

emissions are not expected to increase ambient concentration above significance. Therefore, the Ambient Air Quality Assessment completed by the Santa Barbara County Air Pollution Control District will not be revised and is included in **Attachment D**.

Source Information

The Ambient Air Quality Impact Analysis consisted of point source releases, volume source releases and three line source releases. The volume source releases were used to model fugitive reactive organic compound emissions and on-site operations, maintenance and drilling emissions. The area of the volume sources representing the fugitive reactive organic compound emissions were estimated to cover the anticipated area that components will be located. Some areas were represented by multiple smaller volume sources to best cover the anticipated areas of possible leaks since volume sources cannot be angled or modeled as poly-volume sources in AERMOD. Gas service components and oil service components have different average release heights in several modeled areas, therefore, gas service and oil service components were modeled as separate sources in these areas. All components located in the group station and steam generator sites were conservatively modeled using the same release height. The volume sources representing the on-site operations, maintenance and drilling emissions were estimated to cover the well pads. The point source releases were used for steam generator stacks, the emergency generator stack, the flare stack, and tank emissions. Stack parameters for the steam generators, the emergency generator, and the flare were taken from manufacturer specifications (Attachment E, Equipment Specifications). Tank emissions and release parameters were input according to Santa Barbara County Air Pollution Control District's Health Risk Assessment modeling guideline's (SBCAPCD 2015) Appendix B. The line sources were used for onsite vehicular travel and off-site travel from the property boundary to 1,000 feet from the property boundary. Line sources were mapped according to estimated travel routes. All sources including their AERMOD identification ID, release type, Universe Transverse Mercator coordinates (WGS84 Zone 10 North), and release parameters may be found in *AAQA Tables ATC_03062016 (Revised by APCD).xlsx* located in the *Aera_CEQA_AQIAandHRA.zip* file.

The facility operates 24 hours a day and seven days per week, therefore, all equipment is assumed to operate the same hours as the facility with the exception of emergency equipment. **Table 5-31** below describes the operating schedule of the emergency equipment.

Table 5-31 - Operating Schedule for Flare and Emergency Generator

Source	AERMOD ID	Hours/day	Hours/Year	Days/Week	Weeks/Year
Flare	STCK16	1.5	180	Varies	Varies
Emergency Generator	STCK14	24	600	Varies	Varies

The worst case emergency flaring scenario was also included in the ambient air quality model. This scenario increased the flare's sulfur dioxide hourly, 3- hour and daily emissions over typical operating schedule shown in **Table 5-31**. The worst case emergency flaring scenario would occur due to a control failure or blockage in flow path of produced gas through gas sweetening vessels. Diverted gas to the flare will be a blend of produced gas and make-up gas with an expected hydrogen sulfide concentration of 10,000 parts per million by volume. This

would result in five minutes of flaring resulting in expected flow of 736 standard cubic feet per day and 1.32 pounds of sulfur dioxide emissions.

Emission Quantification

Criteria pollutant emissions calculated for this analysis may be found in *AAQA Tables ATC_03062016 (Revised by APCD).xlsx* located in the *Aera_CEQA_AQIAandHRA.zip* file.

Meteorological Data

The meteorological data utilized in the Ambient Air Quality Impact Analysis was obtained from the Santa Barbara County Air Pollution Control District's website. The Santa Maria Airport meteorological data was used as it was closest to the Project site and a better representation to the meteorological conditions in the Project area. The Santa Maria Airport meteorological data includes the years from 2010-2014.

Air Dispersion Model

The most recent version of Environmental Protection Agency's AMS/EPA Regulatory Model - AERMOD (recompiled for the Lakes ISC-AERMOD View interface version AERMOD_17052) was used to predict the dispersion of emissions from the Project. Regulatory default options were selected using rural dispersion and elevated terrain. Building Profile Input Program was run to calculate building downwash for stacks near buildings and tanks. Building and structures dimensions and Universe Transverse Mercator coordinates (WGS84 Zone 10 North) are listed in *TABLE I-11: Structure Parameters Used to Calculate Building Downwash* of the file *AAQA Tables ATC_03062016 (Revised by APCD).xlsx*. These files are located in the *Aera_CEQA_AQIAandHRA.zip* file.

Receptors

A total of 5,204 receptors were analyzed for the Ambient Air Quality Impact Analysis which included 620 property boundary receptors, 48 residential receptors, four worker receptors, 33 road receptors, and grid receptors. Individual residential and worker receptors are not necessary for an Ambient Air Quality Impact Analysis, however, the same receptor grid was used for both the Ambient Air Quality Impact Analysis and Health Risk Assessment for consistency purposes. All receptors were modeled with a flagpole height of 0.0 meters.

There are no sensitive receptors such as schools, daycare facilities, hospitals, or care facilities located within two kilometers of the Project site. However, Benjamin Foxen Elementary School is located approximately 2,100 meters from the Project boundary. The Sisquoc residential neighborhood is located adjacent to the elementary school. Therefore, a 25 meter grid which included 750 grid receptors was placed over the elementary school and residential neighborhood.

All grid and receptor data may be found in the file *Aera_CEQA_AQIA.ADO* located in the *Aera_CEQA_AQIAandHRA.zip* file.

Ambient Air Quality Impact Assessment Results

The results for the Ambient Air Quality Assessment are shown below in **Table 5-32**. As seen below, all impacts are below the Ambient Air Quality Standards except for particulate matter up to 10 microns. The background concentrations of particulate matter up to 10 microns for the 2009-2011 averaging period exceed the Ambient Air Quality Standards. Aera's proposed Project contributes to 16 percent of the 24-hour particulate matter up to 10 microns Ambient Air Quality Standard and 9 percent of the annual particulate matter up to 10 microns Ambient Air Quality Standard.

The ambient background concentrations in **Table 5-32** are from the years 2009 through 2011, measured in Santa Maria when available, or in Lompoc if data was not available for Santa Maria. The background concentrations are documented in *Background Concentrations for Aera AQIA for ATC 14624.xlsx* located in the *Aera_CEQA_AQIAandHRA.zip* file

Table 5-32 - Cumulative Impacts Vs. Ambient Air Quality Standards

Pollutant	Averaging Period	Background ($\mu\text{g}/\text{m}^3$)	Project ($\mu\text{g}/\text{m}^3$)	Project + Background ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)	CAAQS ($\mu\text{g}/\text{m}^3$)	Below Applicable Standard(s)
Oxides of nitrogen	1-hour	92.1	81.48	173.6	188.68	338	Yes
	Annual	14.4	1.84	16.24	100	57	Yes
Oxides of sulfur	1-hour	13.1	20.4	33.5	196	655	Yes
	3-hour	8.0	13.1	21.1	1,300	---	Yes
	24-hour	5.2	1.97	7.3	---	105	Yes
	Annual	2.6	0.29	2.9	80 ¹	---	Yes
Carbon monoxide	1-hour	3,565	443.5	4,008	40,000	23,000	Yes
	8-hour	1,311	212.9	1,524	10,000	10,000	Yes
Particulate matter up to 10 microns in diameter	24-hour	76.2	7.86	84.06	150	50	No
	Annual	24.2	1.76	25.96	---	20	No
Particulate matter up to 2.5 microns in diameter	24-hour	17.3	1.71	19.01	35	---	Yes
	Annual	7.0	0.27	7.27	12	12	Yes
Definitions:							
$\mu\text{g}/\text{m}^3$ = micrograms per cubic meters							
NAAQS = National Ambient Air Quality Standards							
CAAQS = California Ambient Air Quality Standards							
Notes:							
1. Annual National Ambient Air Quality Standards for sulfur dioxide was revoked.							

Table 5-32 above identifies that the Project emission concentrations when combined with the maximum measured background air concentrations used in this analysis. The resulting Project impacts do not exceed the ambient air quality standards with the exception of the State particulate matter up to 10 micron 24-hour and annual standards which exceeded the ambient air quality standard based on background concentrations alone. Additionally, the particulate matter up to 10 micron's modeled concentrations for the Project are well below the Ambient Air Quality Standards.

6.0 CUMULATIVE IMPACTS

Santa Barbara County Air Pollution Control District under California Environmental Quality Act defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. Based on the analysis conducted for this Project, the Project is individually *significant* for unmitigated criteria pollutant emissions from long-term operations and unmitigated greenhouse gas impacts. This Air Quality Impact Analysis, however, also considered impacts of the proposed Project along with the impacts of other projects previously proposed in the area. Cumulative ozone Impacts (reactive organic gases and nitrogen oxides) were considered from numerous sources within the region including transport from outside the region. Ozone is formed through chemical reactions of reactive organic gases and nitrogen oxides in the presence of sunlight.

CUMULATIVE REGIONAL AIR QUALITY IMPACTS

The most recent, certified South Central Coast Air Basin Emission Inventory data available from the California Air Resources Board is based on data gathered for the 2012 annual inventory. This data will be used to assist the Santa Barbara County Air Pollution Control District in demonstrating attainment of Federal 1-hour ozone Standards. **Table 6-1** provides a comparative look at the impacts proposed by the subject Project to the South Central Coast Air Basin Emissions Inventory and the Santa Barbara County portion of the South Central Coast Air Basin.

Table 6-1 - Project Emissions Relative to 2012 Emission Inventory for South Central Coast Air Basin

Emission Sources	Carbon Monoxide Tons/Year	Reactive Organic Gases Tons/Year	Nitrogen Oxides Tons/Year	Sulfur Oxides Tons/Year	Particulate Matter (PM ₁₀) Tons/Year	Particulate Matter (PM _{2.5}) Tons/Year
Santa Barbara County (South Central Coast Air Basin Portion)	98,404	66,905	9,819	803	10,147	6,716
South Central Coast Air Basin	231,082	163,520	27,302	1,643	26,864	14,126
Proposed Project ¹	1,252.0	8.28	7.48	8.88	10.11	4.99
Proposed Project's percent of Santa Barbara County	1.27%	0.01%	0.08%	1.11%	0.10%	0.07%
Proposed Project's percent of South Central Coast Air Basin	0.54%	0.01%	0.03%	0.54%	0.04%	0.04%
Definitions: PM ₁₀ = particulate matter up to 10 microns in diameter PM _{2.5} = particulate matter of less than 2.5 microns						

Source: California Air Resources Board 2014a

As shown in **Table 6-1** the proposed Project does not pose a significant increase to basin emissions, as such basin emissions would be essentially the same if the Project is approved.

Tables 6-2 through **6-4** provide California Air Resources Board Emissions Inventory

projections for the year 2020 for the Santa Barbara County Air Pollution Control District. The proposed Project produces a small portion of the total emissions within Santa Barbara County Air Pollution Control District boundaries.

Table 6-2 - Emission Inventory South Central Coast Air Basin 2020 Projection – Tons per Year

	Reactive Organic Gases	Nitrogen Oxides	Particulate Matter (PM ₁₀)
Total Emissions	148,044	18,652	27,594
Total Stationary Source Emissions	7,446	2,811	803
Total Area-Wide Source Emissions	9,928	1,022	14,381
Total Mobile Source Emissions	7,446	13,250	1,351
Total Natural Source Emissions	123,224	1,570	11,060
Definitions:			
PM ₁₀ = particulate matter up to 10 microns in diameter			
Note: Total may not add due to rounding.			

Source: California Air Resources Board 2014 (www.arb.ca.gov/app/emsinv/2013/emssumcat.php)

Table 6-3 - Emission Inventory South Central Coast Air Basin – Santa Barbara County Portion 2020 Projection – Tons per Year

	Reactive Organic Gases	Nitrogen Oxides	Particulate Matter (PM ₁₀)
Total Emissions	59,678	6,972	10,220
Total Stationary Source Emissions	3,577	1,497	365
Total Area-Wide Source Emissions	3,212	365	4,015
Total Mobile Source Emissions	2,008	4,453	402
Total Natural Source Emissions	50,881	694	5,439
Definitions:			
PM ₁₀ = particulate matter up to 10 microns in diameter			
Note: Total may not add due to rounding.			

Source: California Air Resources Board 2014 (www.arb.ca.gov/app/emsinv/2013/emssumcat.php)

Table 6-4 - 2020 Emissions Projections – Proposed Project and Santa Barbara County Air Pollution Control District – Tons per Year

	Reactive Organic Gases	Nitrogen Oxides	Particulate Matter (PM ₁₀)
Proposed Project	8.28	7.48	10.11
Santa Barbara County	59,678	6,972	10,220
South Central Coast Air Basin	148,044	18,652	27,594
Proposed Project Percent of Santa Barbara County	0.01%	0.11%	0.10%
Proposed Project Percent of South Central Coast Air Basin	0.01%	0.04%	0.04%
Definitions:			
PM ₁₀ = particulate matter up to 10 microns in diameter			
Notes: The emission estimates for Santa Barbara County and the South Central Coast Air Basin are based on 2020 projections. The Proposed Project emission estimates are for the proposed emissions that are not already included in the South Central Coast Air Basin Emissions Inventory. Project emissions are based on the worst case year emissions estimates to present the most conservative comparison. The Project's emissions are expected to decline as cleaner, less polluting vehicles replace vehicles with higher emissions.			

Source: California Air Resources Board 2014 (www.arb.ca.gov/app/emsinv/2013/emssumcat.php)

As shown above, the proposed Project would pose no substantial impact on regional ozone and particulate matter up to 10 microns in diameter formation. The regional contribution to these cumulative impacts would be negligible. It is reasonable to conclude that the Project is not considered cumulatively significant with regard to particulate matter up to 10 microns in diameter and regional ozone precursors, including reactive organic gases and nitrogen oxides impacts based on evaluation of the regional emission inventory.

CUMULATIVE LOCALIZED AIR QUALITY IMPACTS

A review of a cumulative project lists provided by the Santa Barbara County and Santa Barbara County Air Pollution Control District indicates that there are 16 other cumulative oil and gas projects in Santa Barbara County (**Table 6-5**) and 117 cumulative developments projects in north Santa Barbara County (**Table 6-6**).

The listings provided below in **Tables 6-5 and 6-6** is only a geographical reference to demonstrate the construction activity in the Project vicinity.

Table 6-5 - Cumulative Oil and Gas Projects in the Project Vicinity

Case Number	Project Name	Assessor's Parcel Number	Area	Description	Permit Status	Type	Filed
09PPP-00000-00002	Santa Maria Energy ODPP	101020074	San Antonio Creek	136 wells, 3-mile oil line	Approved	Production Plan	11/12/2009
06PPP-00000-00001	Cimarex Oil Production Plan	113190001	Santa Maria	2 exploratory wells	Approved	Production Plan	5/9/2006
08PPP-00000-00001	Rock Energy Oil & Gas Production Plan	129100014	Santa Maria		Under Construction	Production Plan	6/5/2008
09PPP-00000-00001	Underground Energy Production Plan	133080005	Santa Maria	26 wells	Approved	Production Plan	9/23/2009
10PRE-00000-00013	ERG -Fugler Lease	101040017	Santa Maria	20 wells	Proposed	Preapplication	12/21/2010
11PPP-00000-00001	North Garey ODPP	129180007	Santa Maria	56 wells	In Process	Production Plan	5/31/2011
05PPP-00000-00001	Breitburn Production Plan	101020041	Santa Maria	96 wells	Under Construction	Production Plan	7/1/2005

Case Number	Project Name	Assessor's Parcel Number	Area	Description	Permit Status	Type	Filed
11PRE-00000-00013	ERG Resources-Los Alamos Fee	101070001	Santa Maria		In Process	Preapplication	8/1/2011
11PRE-00000-00017	Petrorock, LLC - Schopp Lease	128100027	Santa Maria		In Process	Preapplication	8/15/2011
11PRE-00000-00020	Amrich Energy - Tognazzini-Adams Lease	113110001	Santa Maria		In Process	Preapplication	9/20/2011
11PRE-00000-00021	ERG - Gwinn Fee Lease	101070003	Santa Maria	4 wells	In Process	Preapplication	11/22/2011
10PRE-00000-00011	ERG Resources, LLC Pre-	101040006	Santa Maria	20 Wells	Proposed	Preapplication	12/9/2010
11PRE-00000-00003	Amrich Energy - Hansen Lease	113270006	Santa Maria	4 Wells	Proposed	Preapplication	2/9/2011
11PRE-00000-00007	ERG Resources - global warming	129180013	Santa Maria	6 Wells	Proposed	Preapplication	6/3/2011
12DVP-00000-00005	ERG Foxen Pipeline	129180015	Santa Maria	2.9 Mile Oil Pipeline	In Process	Development Plan	6/18/2012
11PRE-00000-00002	ERG Resources - Pinal Lease	101020078	Santa Maria	2 Wells	Proposed	Preapplication	1/18/2011

Source: Santa Barbara County 2014

Table 6-6 - Cumulative Land Development Projects in North Santa Barbara County

Case Number	Project Name	Res Units	Comm. sf	Ind. sf	Ag Dev sf	Misc.
03CUP-00000-00059	VENTUCOPA ROCK PLANT EXPANSION					400,000 tons
05TPM-00000-00023	DEITRICH LOT SPLIT (TPM 14,689)	2				
08TPM-00000-00014	RUSSELL RANCH LOT SPLIT (TPM 14,756)	2				

Case Number	Project Name	Res Units	Comm. sf	Ind. sf	Ag Dev sf	Misc.
03TRM-00000-00003	CLUBHOUSE ESTATES TRACT MAP (TM 14,629)	52				
07DVP-00000-00016	SCOGGIN/SUNDHEIM WINERY TIER II				20,000	
10RVP-00000-00048	SEPULVEDA BLDG MATERIALS MINING					2,000 tons/year
11CUP-00000-00018	SANFORD WINERY REVISION					Special events
11PRE-00000-00022	ARCHDIOCESE QUEEN OF ANGLES	4				
02TPM-00000-00011	SILVERADO PREMIUM PROPERTIES TPM	4				
06TRM-00000-00002	RANCHO LA LAGUNA TRACT MAP 14,709	13				
07TPM-00000-00010	CARRARI LOT SPLIT (TPM 14,733)	3				
10TPM-00000-00007	NOLAN AG REPLACEMENT CONTRACT/ TPM 14,775	2				
02TRM-00000-00007	LEGACY ESTATES TRACT MAP	59				
05TRM-00000-00006	JACKSON TRACT MAP 14,690	6				
06TPM-00000-00026	ALAMO TRUST LOT SPLIT (TPM 14,717)	2				
07TPM-00000-00007	ALAMOS FOXEN LLC (TPM 14,728)	2				
07TPM-00000-00009	ALMADA LOT SPLIT (TPM 14,731)	2				
09CUP-00000-00026	HELGELAND MIXED USE BUILDING	5				
09LLA-00000-00006	SCHMIDT LOT LINE ADJUSTMENT	3				
10PRE-00000-00010	THE CHILDREN'S PROJECT ACADEMY	56				
11LUP-00000-00148	ROSEMARY COMMONS	9				
11LUP-00000-00149	SAGEBRUSH JUNCTION	8	5,600			
06DVP-00000-00009	OSR ENTERPRISES/NRG ENTERPRISES LP				237,636	
06DVP-00000-00013	HIN DEVELOPMENT PLAN			9,750		
06TPM-00000-00019	OSR/NRG ENTERPRISES (TPM 14,707)	3				
07DVP-00000-00004	JOHNSON TRUCK SERVICE CENTER			7,200		
07DVP-00000-00010	DORE WINERY				22,509	
07DVP-00000-00013	RIVERBENCH WINERY				2,730	

Case Number	Project Name	Res Units	Comm. sf	Ind. sf	Ag Dev sf	Misc.
07GPA-00000-00011	NORTH COUNTY JAIL GENERAL PLAN AMENDMENT					250,465
08DVP-00000-00007	PLANTEL NURSERIES				972,720	
08DVP-00000-00032	ARC VINEYARDS WINERY				40,180	
08CUP-00000-00074	ARC VINEYARDS EMPLOYEE DWELLINGS	4				
08TPM-00000-00003	OVERHOLTZER LOT SPLIT (TPM 14,744)	2				
08TPM-00000-00012	RANCHO REAL LLC LOT SPLIT (TPM 14,752)	4				
10DVP-00000-00016	ADAM BROS FARMING				100,000	
10PRE-00000-00007	GRAYSON SERVICE PREAPPLICATION					Steam generation
10TPM-00000-00004	AQUISTAPACE TENTATIVE PARCEL MAP (TPM 14,772)	2				
10TPM-00000-00005	GREKA LAND HOLDINGS TENTATIVE PARCEL MAP (TPM 14,773)	2				
11DVP-00000-00012	COASTAL GROWERS SUPPLY STORAGE		7,500			
11DVP-00000-00013	SIERRA MADRE RANCH WINERY		10,602			
11DVP-00000-00014	'F' STREET DEVELOPMENT PLAN - 3		5,500			
11DVP-00000-00015	'F' STREET DEVELOPMENT PLAN - 4		5,500			
06DVP-00000-00016	ORCUTT UNION PLAZA/WILL COMMERCIAL		66831			
06TPM-00000-00014	GAYDA LOT SPLIT (TPM 14,703)	3				
09GPA-00000-00004	KEY SITE 17 GENERAL PLAN AMENDMENT	257				
10LUP-00000-00461	VAN VEEN MIXED USE BUILDING		8,601			
10TPM-00000-00001	BROADWAY & UNION MERCANTILE	2				
00TRM-00000-06003	OAK GLEN DEVELOPMENT	52				
01CUP-00000-00115	ORCUTT AQUACENTER		31,074			
02NEW-00000-00053	LEO EVANS-NORTHPOINTE	32				
02TRM-00000-00010	ADDAMO WINERY/DIAMANTE	5				
03DVP-00000-00009	RICE RANCH DEVELOPMENT PLAN	725				
03TPM-00000-00008	DANIELS LOT SPLIT	2				

Case Number	Project Name	Res Units	Comm. sf	Ind. sf	Ag Dev sf	Misc.
03TRM-00000-00001	FETYKO TRACT MAP	18				
04TPM-00000-00010	BURINDA LOT SPLIT	2				
04TPM-00000-00013	MENDOZA LOT SPLIT	2				
05SPP-00000-00002	ENGLISH-JOSEPH SPECIFIC PLAN	30	56,800			
05TPM-00000-00015	MEYER LOT SPLIT	2				
05TPM-00000-00018	TREUR LOT SPLIT	2				
05TRM-00000-00004	WILKS TRACT MAP 14,681	3				
06DVP-00000-00008	ORCUTT MARKETPLACE		320,663			
06GPA-00000-00016	KEY SITE 3 GENERAL PLAN AMENDMENT	316				
06TPM-00000-00003	CONLEY LOT SPLIT (TPM 14,693)	3				
06TPM-00000-00022	HOPE COMMUNITY CHURCH (TPM 14,711)	3				29,373
06TPM-00000-00024	CHALOUPKA LOT SPLIT (TPM 14,714)	2				
07DVP-00000-00009	PR INVESTMENTS/EVERGREEN SHOPPING		61,958			
07DVP-00000-00020	ST JOSEPH DEVELOPMENT PLAN					111,396
07DVP-00000-00026	ST LOUIS DE MONTFORT CHURCH					49,666
07TRM-00000-00004	ORCUTT MARKETPLACE TRACT MAP	12				
08TPM-00000-00013	HAWKINS LOT SPLIT (TPM 14,754)	2				
08TRM-00000-00001	HUMMEL VILLAGE II AIRSPACE CONDOS	20				
09DVP-00000-00029	CLARK AVENUE COMMERCIAL		12,875			
09NGD-00000-00014	CHALOUPKA NEGATIVE DEC	1				
10DVP-00000-00002	KEY SITE 30 DEVELOPMENT PLAN	69				
10GPA-00000-00006	REVISED RICE RANCH General Plan Amendment 2011					
10TRM-00000-00002	KNOLLWOOD TENTATIVE TRACT MAP	195				
10TRM-00000-00003	TERRACE VILLAS TRACT MAP 14,770	16				
11CUP-00000-00003	PRIMROSE SPECIAL CARE FACILITY					Residential care facility

Case Number	Project Name	Res Units	Comm. sf	Ind. sf	Ag Dev sf	Misc.
11TPM-00000-00003	RICHARDSON TENTATIVE PARCEL MAP	4				
01TPM-00000-00006	THOMSON PARCEL MAP 14,568	3				
06TPM-00000-00020	RANCHO ENCANTADO (TPM 14,708)	3				
03TPM-00000-00010	MARCELINO SPRINGS (TPM 14,630)	3				
04TPM-00000-00002	KASLOW LOT SPLIT	2				
04TPM-00000-00007	KARAS LOT SPLIT (TPM 14,653)	3				
05CUP-00000-00033	VALLEY SAND AND SOIL REVISION					14,500 cy/yr
05RPP-00000-00001	VALLEY SAND AND SOIL REVISION					reclamation
06TPM-00000-00001	STULL LOT SPLIT (TPM 14,691)	2				
06TPM-00000-00004	COFFEY LOT SPLIT (TPM 14,633)	2				
06TPM-00000-00012	MAGALI FARMS LOT SPLIT (TPM 14,701)	3			58,280	
06TPM-00000-00015	RICCI LOT SPLIT (TPM 14,704)	2				
06TPM-00000-00021	MCCOMBS LOT SPLIT (TPM 14,710)	2				
06TPM-00000-00028	HIGGINS/MARTINO LOT SPLIT (TPM 14,720)	2				
06TPM-00000-00029	LORENZEN LOT SPLIT (TPM 14,721)	2				
06TPM-00000-00030	MEYER LOT SPLIT (TPM 14,722)	2				
07TPM-00000-00002	EBEJER LOT SPLIT (TPM 14,723)	2				
08DVP-00000-00018	DE WERD TIER II WINERY				9,856	
08LUP-00000-00117	ECLYPSE WINERY				1,636	
03CUP-00001-00024	GRANITE MINING REVISION					250,000 tons/year
08TPM-00000-00004	SKYTT FAMILY LOT SPLIT (TPM 14,745)	4				
08TPM-00000-00006	AMON LOT SPLIT (TPM 14,746)	2				
08TPM-00000-00010	SIERRA GRANDE LOT SPLIT (TPM 14,748)	2				
08TPM-00000-00017	HANSON TENTATIVE PARCEL MAP	2				
08TRM-00000-00003	ESTELLE VINEYARD ESTATES TRACT	11				
08TRM-00000-00005	HAAS TRACT MAP (TM 14,753)	8				

Case Number	Project Name	Res Units	Comm. sf	Ind. sf	Ag Dev sf	Misc.
09DVP-00000-00019	INN AT MATTEI'S TAVERN		37,200			
09DVP-00000-00034	VINCENT VINEYARDS & WINERY TIER III				5,918	
09DVP-00000-00035	TTT VINEYARDS WINERY		4,945			
09TPM-00000-00002	TURNBULL TENTATIVE PARCEL MAP	3				
09TPM-00000-00005	GAVLAK LOT SPLIT (TPM 14,765)	2				
10AMD-00000-00008	BUELLFLAT ROCK COMPANY AMENDMENT					Mining operation
10DVP-00000-00007	LARNER TIER II WINERY		11,000			
10CUP-00000-00036	SANTA YNEZ VALLEY AIRPORT		28,000			
10PRE-00000-00003	SANTA YNEZ VALLEY SENIOR HOUSING	22				
10TPM-00000-00002	BAR Z LOT SPLIT (TPM 14,767)	2				
11DVP-00000-00009	CLAXTON WINERY		19,818			
11LLA-00000-00009	DREYFUSS LOT LINE ADJUSTMENT	2				
11RVP-00000-00014	BRIDLEWOOD DEVELOPMENT PLAN REVISION		7,662		1,595	

Source: Santa Barbara County 2014

None of the projects in the above cumulative project lists (**Tables 6-5 and 6-6**) would be built in the immediate vicinity of the Project; therefore, there would be no operational localized impacts associated with cumulative projects and criteria pollutant emissions. Operational regional impacts from criteria pollutants could be produced; however, as multiple projects would emit into the same air basin at the same time. Additionally, no cumulative significance thresholds are shown since no cumulative thresholds have been established by the Santa Barbara County Air Pollution Control District, California Air Resources Board or other regulatory authority. These projects represent all known and reasonably foreseeable projects in the area. Air quality impacts from cumulative development could be cumulatively significant because the air basin is in nonattainment for several criteria pollutants (See **Table 4-1**).

The Project's unmitigated operational impacts would be significant; therefore, the Project's unmitigated cumulative contribution would be cumulatively considerable and would be a significant cumulative impact. To reduce these Project impacts, the Project will implement Mitigation Measures AQ-1 and AQ-2. With the Project's impacts reduction with implementation of Mitigation Measures AQ-1 and AQ-2, the Project's operational contribution to cumulative impacts with mitigation would not be cumulatively considerable and would be considered *less than significant*.

7.0 IMPACTS TO GLOBAL CLIMATE CHANGE

GLOBAL CLIMATE CHANGE IMPACTS FROM THE PROPOSED PROJECT

There are a number of factors available for estimating the greenhouse gas emissions. Not all greenhouse gases exhibit the same ability to induce climate change; as a result, greenhouse gas contributions are commonly quantified in carbon dioxide equivalencies. Greenhouse gas emissions were calculated using California Emissions Estimator Model, EMFAC2014, and emission factors from the California Air Resources Board's Mandatory Reporting Rule. Fugitive emissions from stationary sources were conservatively estimated to be 100 percent methane for greenhouse gas purposes. These emissions calculations can be found in **Attachment A** and are the worst case year for combined construction and operational emissions are summarized in **Table 7-1** below.

Table 7-1 - Estimated Annual Greenhouse Gas Emissions for Peak Year (Metric Tons/Year)

Source	Carbon Dioxide Equivalent
Unmitigated Construction Emissions (Peak Year)	
Construction Equipment Onsite	1,758.1
Construction Offsite Mobile	47.74
Drilling Equipment Onsite	3,853.6
Drilling Offsite Mobile	157.6
Replacement Well Drilling Equipment Onsite	101.1
Replacement Well Drilling Offsite Mobile	2.24
Year 2035 Construction Emissions	5,920.3
Unmitigated Operational Emissions (Peak Year)	
Mobile (Excluding Tankers)	1,019.9
Mobile Tankers	6,211.5
Operations and Maintenance	2,769.0
Stationary Equipment	235,111.1
Indirect: Electrical Generation	30,698.3
Year 2035 Operational Emissions	282,478.1
Peak Year 2035 Total	288,398.4
Mitigated Construction Emissions (Peak Year)	
Construction Equipment Onsite	1,758.1
Construction Offsite Mobile	47.74
Drilling Equipment Onsite	3,853.6
Drilling Offsite Mobile	157.6
Replacement Well Drilling Equipment Onsite	101.1
Replacement Well Drilling Offsite Mobile	2.24
Year 2035 Construction Emissions	5,920.3
Mitigated Operational Emissions (Peak Year)	
Mobile (Excluding Tankers)	1,019.9
Mobile Tankers	6,211.5
Operations and Maintenance	2,769.0
Stationary Equipment	235,111.1
Indirect: Electrical Generation	30,698.3
Year 2035 Operational Emissions	282,478.1
Peak Year 2035 Total	288,398.4

Source	Carbon Dioxide Equivalent
Santa Barbara County Threshold	1,000
Significant?	Yes

Since this Project exceeds the 1,000 metric tons of carbon dioxide equivalent per year significance threshold, it would be required to “reduce their greenhouse gas emissions to the applicable threshold, where feasible, through onsite reductions and/or offsite reductions programs approved by the County of Santa Barbara” (Santa Barbara County 2015). As the Project emits more than the 25,000 metric tons carbon dioxide equivalent per year California Air Resources Board threshold for the California Air Resources Board’s Mandatory Reporting Rule, the Project would be a participant of the California Air Resources Board Cap-and-Trade program. It would be issued emission allowances and would be required to reduce greenhouse gas emissions associated with the proposed Project, and/or purchase additional credits, allowances or offsets.

Mitigation Measure AQ-4

Aera will implement a program to quantify, and where practicable and feasible, to reduce greenhouse gas emissions. Operational stationary and mobile greenhouse gas emissions levels (including achieved reductions) will be quantified and reported to the California Air Resources Board as required. Greenhouse gas emissions exceeding the Santa Barbara County CEQA Greenhouse Gas significance threshold will be reduced, where practicable and feasible, through onsite reductions and/or offsite reduction programs approved by the County. Emissions off-sets or purchases required to satisfy California Assembly Bill 32 requirements will be completed according to the California Air Resource Board Cap-and-Trade Program requirements.

8.0 CONSISTENCY WITH THE SANTA BARBARA COUNTY AIR POLLUTION CONTROL DISTRICT CLEAN AIR PLAN

Consistency with land use and population forecasts in local and regional plans, including the Santa Barbara County Air Pollution Control District’s Clean Air Plan, is required under California Environmental Quality Act for all projects. Proposed projects subject to the most recent Clean Air Plan consistency determinations include a wide range of activities such as commercial, industrial, residential, and transportation projects. By definition, consistency with the Clean Air Plan for projects subject to these guidelines means that direct and indirect emissions associated with the Project are accounted for in the Clean Air Plan’s emissions growth assumptions and the Project is consistent with policies adopted in the Clean Air Plan. The Clean Air Plan relies primarily on the land use and population projections provided by the Santa Barbara County Association of Governments and California Air Resources Board on-road emissions forecast as a basis for vehicle emission forecasting. The 2013 Clean Air Plan utilized Santa Barbara County Association of Government’s growth forecasts, to project population growth and associated air pollutant emissions for all of the Santa Barbara County incorporated and unincorporated areas (Santa Barbara County Air Pollution Control District 2015).

Required Evaluation Guidelines

State California Environmental Quality Act Guidelines and the Federal Clean Air Act (Sections 176 and 316) contain specific references on the need to evaluate consistencies between the proposed Project and the applicable air quality attainment plan for the Project site. To accomplish this, the California Air Resources Board has developed a three-step approach to determine project conformity with the applicable air quality attainment plan:

1. *Determination that an Air Quality Attainment Plan is being implemented in the area where the project is being proposed. The Santa Barbara County Air Pollution Control District has implemented its version as an air quality attainment plan, the current, modified, 2013 Clean Air Plan as approved by the California Air Resources Board.*
2. *The proposed project must be consistent with the growth assumptions of the applicable 2013 Clean Plan (Santa Barbara County Air Pollution Control District 2015). The Project emissions appear to be within the emissions inventory for Oil and Gas operations within the Stationary Sources for Santa Barbara County. See Table 8-1 below.*
3. *The project must contain in its design all reasonably available and feasible air quality control measures. The proposed Project incorporates all applicable policy and rule-required implementation measures that will reduce related emissions including the standard dust and equipment exhaust mitigation measures as included in Mitigation Measures AQ-1a and Mitigation Measures AQ-1b. Further, the Project would comply with all appropriate Santa Barbara County Air Pollution Control District Rules and Regulations.*

Figure 8-1 presents an overview of the reactive organic compounds and nitrogen oxide emissions by source in the 2013 Clean Air Plan (Santa Barbara County Air Pollution Control District 2015).

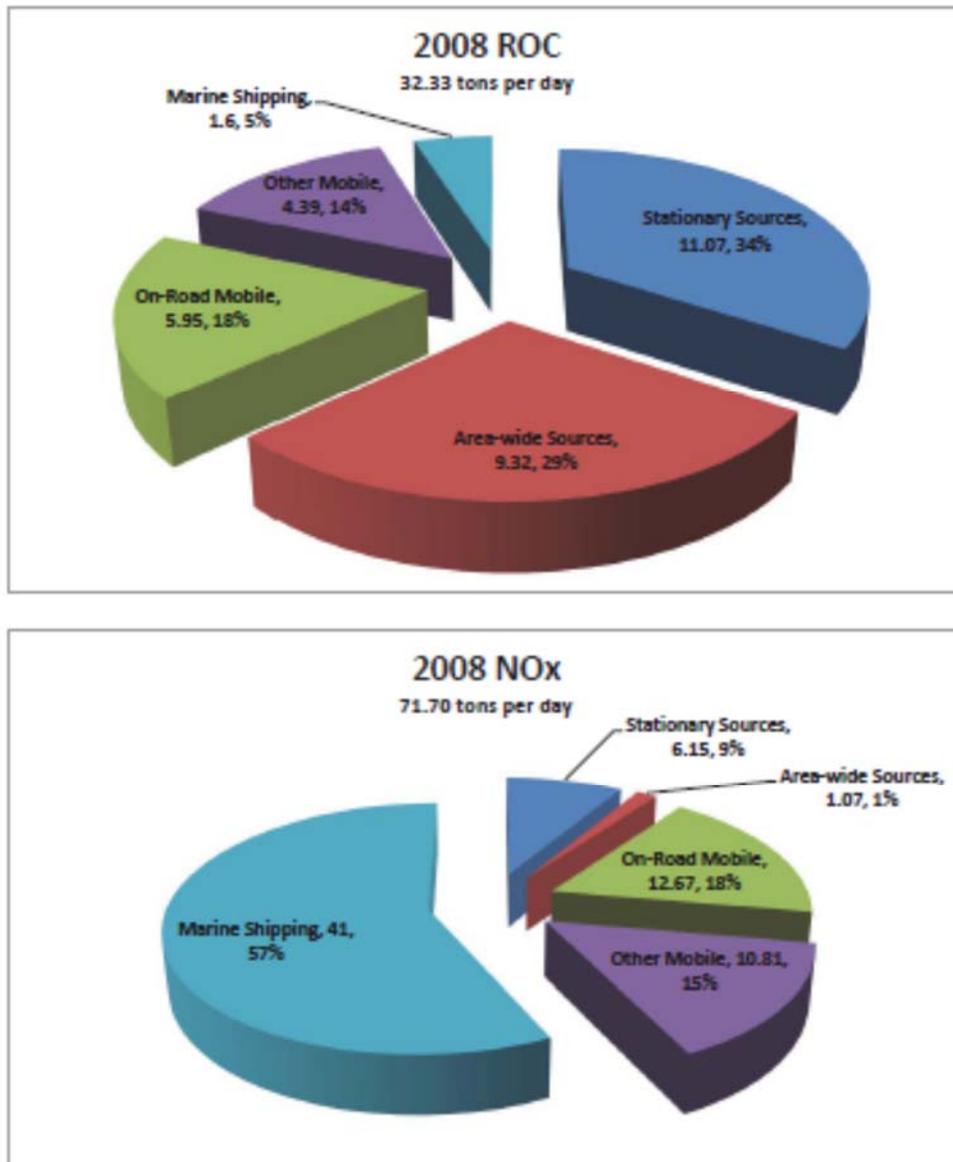


Figure 8-1 - 2013 Clean Air Plan Summary

Table 8-1 excerpts the stationary source emissions and specifically the oil and gas emissions included in the 2013 Clean Air Plan and compares them with the estimated Project stationary source emissions. Based on estimated Project stationary source emissions (from **Table 5-19**), converted from pounds per day into tons per day, the Project's emissions would be found to be 39 percent of reactive organic compounds and 2.6 percent of nitrogen oxides of the oil and gas emissions inventory within the 2013 Clean Air Plan (Santa Barbara County Air Pollution Control District 2015).

Table 8-1 - Evaluation of Project Consistency with 2013 Clean Air Plan

Emission Category	Reactive Organic Compounds (tons/day)	Nitrogen Oxides (tons/day)
Clean Air Plan Stationary Source emissions	11.07	6.15
Clean Air Plan Oil and Gas Emissions	0.1212	1.81
Predicted Project stationary source emissions	0.037915	0.04746
Project Percent of Oil and Gas Emissions in 2013 Clean Air Plan	31.4%	2.6%
Are Project emissions within 2013 Clean Air Plan estimates?	YES	YES

Source: Santa Barbara County Air Pollution Control District 2011b, Insight Environmental Consultants 2017.

Santa Barbara County Air Pollution Control District has established scope and content requirements for air quality sections within Environmental Documents (Santa Barbara County Air Pollution Control District 2014b), specifically including a procedure for determining whether a project is inconsistent with the Clean Air Plan. All projects must: 1) include the Santa Barbara County Air Pollution Control District required dust mitigation measures; 2) be in compliance with all appropriate Santa Barbara County Air Pollution Control District Rules and Regulations; and 3) be consistent with the emissions inventory in the Clean Air Plan.

CONSISTENCY FINDING: Because the Project: 1) includes the required dust mitigation measures as part of Mitigation Measure AQ-1a; 2) is in compliance with all Santa Barbara County Air Pollution Control District appropriate Rules and Regulations; and 3) estimates emissions levels that are reasonably within the 2013 Clean Air Plan emission inventory for oil and gas stationary sources; the Project therefore can be found to be consistent with the 2013 Clean Air Plan.

9.0 MITIGATION MEASURES AND RESIDUAL IMPACTS

Air Quality mitigation measures and residual impacts are discussed for each impact separately.

IMPACT AQ-1 (Short-Term Construction Emissions) MITIGATION MEASURES AND RESIDUAL IMPACTS

Mitigation Measure AQ-1

- a) During construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. The Project should water exposed unpaved traffic areas two to three times per day or as needed,

and with increasing frequency when wind speed exceeds 15 miles per hour. Reclaimed water should be used if available and practicable. Soil binders may be used instead of water if practical. The amount of disturbed area will be minimized. Vehicle speeds on unpaved roads will be limited to 15 miles per hour or less. If stockpiling of fill material is required, soil stockpiled for more than two days will be covered, kept moist, or treated with soil binders to mitigate dust generation. Trucks transporting fill material to and from the site will be covered with a tarp from the point of origin. Gravel pads or shakers will be installed at external access points to prevent tracking mud onto public roads. After clearing, grading, earth moving, or excavation is completed, disturbed areas will be watered, re-vegetated, or otherwise controlled to mitigate dust generation.

- b) All non-exempt portable diesel-powered construction equipment will be registered with the state's portable equipment registration program OR will obtain a Santa Barbara County Air Pollution Control District permit. Fleet owners of mobile construction equipment are subject to the California Air Resource Board Regulation for In-use Off-road Diesel Vehicles (Title 13 California Code of Regulations, Chapter 9, § 2449), the purpose of which is to reduce diesel particulate matter and criteria pollutant emissions from in-use (existing) off-road diesel-fueled vehicles. For more information, please refer to the California Air Resources Board website at www.arb.ca.gov/msprog/ordiesel/ordiesel.htm. All commercial diesel vehicles are subject to Title 13, § 2485 of the California Code of Regulations, limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading will be limited to five minutes; electric auxiliary power units will be used whenever possible.
- c) Diesel construction and drilling equipment will meet the California Air Resources Board Tier 4 Final emission standards for off-road heavy-duty diesel engines.

RESIDUAL IMPACTS OF AQ-1a, AQ-1b and AQ-1c

Emission reductions achieved through the implementation of Mitigation Measures AQ-1a, AQ-1b and AQ-1c would reduce fugitive dust and criteria air pollutant emissions during the short-term construction phase to less than significant levels with implementation of these mitigation measures. There could potentially be secondary water supply impacts from the use of water for dust control; it has been found that recycled or grey water or soil stabilizers could be used for dust control applications and therefore would have no significant residual impacts on water supply. There could potentially be secondary energy generation impacts in the manufacturing new Tier 4 engines and equipment; these engines are designed to reduce criteria air pollutants and greenhouse gas emissions, which would be expected to off-set any additional energy consumed in manufacturing of these new technologies. There would therefore be no residual or secondary impacts from Mitigation Measures AQ-1a, AQ-1b and AQ-1c.

IMPACT AQ-2 (Long-Term Operations Emissions) MITIGATION MEASURES AND RESIDUAL IMPACTS

Mitigation Measure AQ-2

- a) During operations, use of water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. The Project should water exposed unpaved traffic areas three times per day unless conditions do not warrant such frequency (e.g. during rainy conditions, when the soil is otherwise moist, or when soil stabilizers are effectively eliminating the need for water applications in order to control dust), and with increasing frequency when wind speed exceeds 15 miles per hour. Reclaimed water should be used if available and practicable. Apply soil stabilizers once per month unless conditions do not warrant such frequency (e.g. when previously applied soil stabilizers are continuing to work effectively to control dust). The amount of disturbed area will be minimized. Vehicle speeds on unpaved roads will be limited to 15 miles per hour or less.
- b) In accordance with Santa Barbara County and Santa Barbara County Air Pollution Control District requirements, Aera will provide the required emission reduction credits for stationary source pollutants.
- c) Operation and Maintenance equipment will meet the California Air Resources Board Tier 4 Final emission standards for off-road heavy-duty diesel engines
- d) Emissions will be mitigated to less than significant or to the greatest extent feasible, if less than significant cannot be achieved.

RESIDUAL IMPACTS OF AQ-2a, AQ-2b, and AQ-2c

Emission reductions achieved through the implementation of Mitigation Measures AQ-2a, AQ-2b, and AQ-2c, would reduce fugitive dust, criteria air pollutant and greenhouse gas emissions during the long-term Project operations. There could potentially be secondary energy generation impacts in the manufacturing new engines and equipment; these engines are designed to reduce criteria air pollutants and greenhouse gas emissions, which would be expected to off-set any additional energy consumed in manufacturing of these new technologies. There would therefore be no residual or secondary impacts from Mitigation Measures AQ-2a, AQ-2b, and AQ-2c.

IMPACT AQ-3 (Odors) MITIGATION MEASURES AND RESIDUAL IMPACTS

Mitigation Measure AQ-3

- a) In order to mitigate odor releases from tanks due to hatch release, Aera will set up the vapor recovery system to notify the operator when the tank pressure is within ten percent of the tank relief pressure. Additionally, personal hydrogen sulfide monitors and wind socks that will be deployed onsite for employee safety will further mitigate the risk of objectionable odors leaving the Project site.
- b) The operator will develop an Odor Minimization Plan which will address potential odors from oil field equipment and measures to reduce or eliminate these odors. The

Plan will address issues such as facility information, buffer zones, signs with contact information, logs of odor complaints, protocol for handling odor complaints and odor event investigation and methods instituted to prevent re-occurrence.

RESIDUAL IMPACTS OF AQ-3a and AQ-3b

Implementing these mitigation measures would reduce the potential likelihood and frequency of odor events that have resulted in odor complaints and notice of violations at other oilfields in the past. Although odor events could still occur, the number of odor events would likely be substantially reduced with mitigation as proposed. Therefore, impacts from odors would be reduced to *less than significant*.

IMPACT AQ-4 (greenhouse gas Emissions) MITIGATION MEASURES AND RESIDUAL IMPACTS

Mitigation Measure AQ-4

Aera will implement a program to quantify, and where practicable and feasible, to reduce emissions. Operational stationary and mobile greenhouse gas emissions levels (including achieved reductions) will be quantified and reported to the California Air Resources Board as required. Greenhouse gas emissions exceeding the Santa Barbara County CEQA Greenhouse Gas significance threshold will be reduced, where practicable and feasible, through onsite reductions and/or offsite reduction programs approved by the County. Emissions off-sets or purchases required to satisfy California Assembly Bill 32 requirements will be completed according to the California Air Resource Board Cap-and-Trade Program requirements.

RESIDUAL IMPACTS OF AQ-4

Implementation of Mitigation Measures AQ-4 would reduce the impact of the Project's estimated greenhouse gas emissions through a combination of onsite/offsite reductions, the purchase of offset credits, and the participation in California Air Resources Board's Cap-and-Trade program in order to comply with Santa Barbara County's Greenhouse Gas threshold; therefore, the Project's impact on Greenhouse Gases would be reduced to *less than significant*.

10.0 REFERENCES

- American Industrial Hygiene Association (AIHA), 1989. ODOR Thresholds for Chemicals with Establish Occupational Health Standards.
- American Petroleum Institute (API). 2004. Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry, February 2004.
- Association of Environmental Professionals (AEP). 2007. Recommendations by the AEP on How to Analyze the Greenhouse Gas Emissions and Global Climate Change in California Environmental Quality Act Documents. White Paper. March 2007.
- California Air Pollution Control Officers Association. 2008. "California Environmental Quality Act and Climate Change," January 2008. Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.
- California Air Resources Board. 2014a. Background data research: attainment status, monitoring data, emissions data, Website accessed by Valerie Rosenkrantz, July – August 2014. <http://www.arb.ca.gov/html/ds.htm>
- , 2014b. California Greenhouse gas Emission Inventory 2014 Edition. California Greenhouse Gas Emissions for 2000 to 2012 – Trends of Emissions and Other Indicators. http://www.arb.ca.gov/cc/inventory/data/misc/ghg_inventory_trends_00-12_2014-05-13.pdf
- , 2013. Draft 2010 California Toxics Inventory (CTI) Summary Table (November 2013). <http://www.arb.ca.gov/toxics/cti/cti.htm>
- , 2011. EMFAC2014. Released September 30, 2011. EMFAC2014 provides emission factors that represent the vehicle fleet, speeds, and environmental conditions associated with a project needed to perform project-level air quality modeling. <http://www.arb.ca.gov/msei/msei.htm>
- , 2008. Climate Change Proposed Scoping Plan. October 2008.
- , 2007. Climate Change: Information Regarding ARB's Climate Change Program Pursuant to 2006 State Assembly Bill 32.
- California Energy Commission (CEC). 2006. "California Crude Oil Production and Imports," April 2006. CEC-600-2006-006.
- California Environmental Protection Agency, Air Toxics Hot Spots Program Risk Assessment Guidelines – The Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments, August 2003.
- California Environmental Quality Act, Appendix G – Environmental Checklist Form, Final Text. October 26, 1998.

California Office of Environmental Health Hazard Assessment. 1999. Hot Spots Unit Risk and Cancer Potency Values. June 9, 1999. Desert Research Institute (DRI). 2006.
<http://www.wrcc.dri.edu/cgi-bin/>

California Air Pollution Control Officers Association (CAPCOA). 1992. “Air Toxics Hot Spots Program Risk Assessment Guidelines.” Revised 1992.

----- . 2006a. California Air Toxics Emission Factors (CATEF) database of Hazardous Air Pollutants. <http://www.arb.ca.gov/ei.catef/catef.htm>

----- . 2006b. Public Workshop to Discuss Establishing the 1990 Emission Level and the California 2020 Limit and Developing Regulations to Require Reporting of Greenhouse Gas Emissions. Sacramento CA. December 1, 2006.

----- . 2008. “California Environmental Quality Act and Climate Change – Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Act,” January 2008

----- . 2013. California Emissions Estimator Model, version 2013.2.2, released October 2013.

California Climate Action Registry, 2009. California Climate Action Registry General Reporting Protocol Version 3.1, January 2009.

California Environmental Protection Agency (CalEPA), 2006. CalEPA Climate Action Team Executive Summary. Climate Action Team Report to Governor Schwarzenegger and the California Legislature. Sacramento CA. March 2006.

California Environmental Quality Act. 2012. (Public Resources Code 21000 to 21177) and California Environmental Quality Act Guidelines (California Code of Regulations Title 14, Division 6, Chapter 3, Sections 15000 – 15387). California Environmental Quality Act Website accessed in March 2014 by Matt Daniel of IEC:
<http://ceres.ca.gov/ceqa/guidelines/>

Canadian Nuclear Society. 1998. 19th Annual Conference. October 1998.

Intergovernment Panel on Climate Change (IPCC). 2007. “Fourth Assessment Report. 2007”

Santa Barbara County. 2011. Santa Barbara County Climate Action Strategy; Phase 1 – Climate Action Study. September 2011. Long Range Planning Division. Planning and Development Department.

<http://www.longrange.sbcountyplanning.org/programs/climateactionstrategy/docs/ClimateActionStudySept2011.pdf>

----- . 2013. Energy and Climate Action Plan Summary Information, Board of Supervisors Briefing (March 12, 2013).

[http://www.colabsbc.org/manager/Upload/NewsAlert/ECA\)_20_Summary.pdf](http://www.colabsbc.org/manager/Upload/NewsAlert/ECA)_20_Summary.pdf)

[. 2013b. Santa Barbara County Board of Supervisors Approval of Santa Maria Energy Production and Development Plans and Laguna County Sanitation District Phase 3](#)

[Recycled Water Pipeline with GHG threshold of 10,000 MT CO₂e/year, November 12, 2013. Weblink://www.sbcountyplanning.org/projects/12DVP-00008SMEnergy/index.cfm](http://www.sbcountyplanning.org/projects/12DVP-00008SMEnergy/index.cfm)

----- [2014. Cumulative development lists for general land use applications and oil and gas leases in north Santa Barbara County.](#)

Santa Barbara County Air Pollution Control District. 2000. Environmental Review Guidelines Procedures for Santa Barbara County Air Pollution Control District, Guidelines for Implementation of the California Environmental Quality Act of 1970 as Amended. Adopted October 19, 1995; Revised November 16, 2000.

----- 2011. 2011 Santa Barbara County Pollutant Summary. Website access by V. Rosenkrantz of IEC during July and August 2014. <http://www.sbcapcd.org/sbc/2011-POLLUTANTS-Summary.pdf>

----- 2014a. Current Rules and Regulations, Attainment Status, August 2014. Site accessed by V. Rosenkrantz of IEC July and August of 2014. <http://www.sbcapcd.org>

----- 2014b. Scope and Content of Air Quality Sections in Environmental Documents, Prepared by Technology and Environmental Assessment Division. Website: <http://www.sbcapcd.org/apcd/ScopeContentMarch2014.pdf>. Site accessed by Valerie Rosenkrantz of IEC in July 30, 2014.

----- 2015. 2013 Clean Air Plan, Final March 2015. Santa Barbara County's Plan to Attain the State Ozone Standard. Website access by M. Daniel of IEC during August 2015. <http://www.ourair.org/wp-content/uploads/Final2013CleanAirPlan.pdf>

Santa Barbara County. 2008. Environmental Thresholds and Guidelines Manual. Revised January 1995. Revised October 2001. Revised October 2002. Replacement Pages July 2003. Interim Revision to Air Quality Subsection October 2006. Revised January 2008. Revised September 2008. Revised 2015.

U.S. Environmental Protection Agency. 1995. AP-42 Fifth Edition, Compilation of Air Pollutant Emission Factors, as amended. <http://www.epa.gov/ttn/chief/ap42/index.html#toc>

----- 2000. Greenhouse Gas and Global Warming. Available at: <http://www.epa.gov/airtrends/aqtrnd95/globwarm.html>

----- 2007. "The Emissions and Generation Resource Integrated Database For 2006 (eGrid 2006) Technical Support Document." <http://www.epa.gov/cleanenergy/egrid>

----- 2014. Inventory of U.S. Greenhouse Gas Emissions and Sinks. 1990-2012 (April 15, 2014). USEPA# 430-R-14-003

Young, M. 2014. Planner. Santa Barbara County Planning and Development. Telephone conversation and email with V. Rosenkrantz of IEC in August 2014.

Wunderground, 2013. Weather History for Santa Maria. Website accessed by V. Rosenkrantz of IEC on July 31, 2014.

http://www.wunderground.com/history/airport/KSMX/2013/1/1/CustomHistory.html?dayend=31&monthend=12&yearend=2013&req_city=NA&req_state=NA&req_statename=NA

AQIA ATTACHMENTS

- A. Emissions Calculations and Support Documents**
- B. California Emissions Estimator Model v.2013.2.2 Output Files**
- C. Health Risk Assessment**
- D. Ambient Air Quality Analysis**
- E. Equipment Specifications**
- F. Material Safety Data Sheets**

List of Attachments

A. Emissions Calculations and Support Documents

- Equipment Listings and Schedules
 - Construction Equipment Listing and Schedule
 - Drilling and Well Hookup Equipment Listing and Schedule
 - Construction Equipment Horsepower
 - Operations and Maintenance Vehicles and Equipment Listing
- Construction Emissions
 - Construction Equipment Emission
 - Construction Vehicle Travel Emission
 - Construction Fugitive Dust Emission
 - Construction Off-Site Emission
- Drilling Emissions
 - Drilling Equipment Emission
 - Drilling Fugitive Emission
 - Re-drilling Equipment Emission
 - Re-drilling Fugitive Emission
- Non-Stationary Source Operational Emissions
 - Trip Generation Day to Day Operations
 - Tanker Trips and Mileage
 - Operating Mobile Emissions Excluding Tankers
 - Operating Tankers Emissions
 - Operations and Maintenance Emissions
 - Operational Fugitive Dust Emissions
- Stationary Source Operational Emissions
 - Stationary Source Emissions Summary
 - Emergency Generator Emissions
 - Flare Emissions
 - Equipment Component Leaks Fugitive Emissions
 - Equipment Component Counts
 - Truck Loading Rack Emissions
 - Steam Generators Emissions
 - Storage Tanks Emissions
- Electrical Generation Greenhouse Gas Emissions
 - Operating Indirect Electrical Generation Emissions
- Emission Summaries
 - Construction Emissions Summaries
 - Operational Emissions Summaries

B. California Emissions Estimator Model v.2013.2.2 Output Files

C. Santa Barbara County Air Pollution Control District's HRA

- Tables
 - Table 4.1: CEQA-Only Modeling Sources
 - Table 9.1: Cancer Risk at PMI, MEIR and MEIW Receptors
 - Table 9.2: Chronic Non-Cancer Risk at PMI, MEIR and MEIW Receptors

- Table 9.3: Chronic 8-Hour Non-Cancer Risk at PMI and MEIW Receptors
 - Table 9.4: Acute Non-Cancer Risk at PMI, MEIR and MEIW Receptors
 - Table 10.1-1: Risk Driver for Cancer Risk at MEIR – Receptor No. 3751
 - Table 10.1-2: Risk Driver for Cancer Risk at MEIW – Receptor No. 1828
 - Table 10.1-3: Risk Driver for Cancer Risk at PMI – Receptor No. 4873
 - Table 10.2-1: Risk Driver Chronic Non-Cancer Risk at MEIR – Receptor No. 3751
 - Table 10.2-2: Risk Driver Chronic Non-Cancer Risk at MEIW – Receptor No. 1828
 - Table 10.2-3: Risk Driver Chronic Non-Cancer Risk at PMI – Receptor No. 4873
 - Table 10.3-1: Risk Driver 8-Hr Chronic Non-Cancer Risk at MEIW – Receptor No. 1828
 - Table 10.3-2: Risk Driver 8-Hr Chronic Non-Cancer Risk at PMI – Receptor No. 4873
 - Table 10.4-1: Risk Driver Acute Non-Cancer Risk at MEIR – Receptor No. 1873
 - Table 10.4-2: Risk Driver Acute Non-Cancer Risk at MEIW – Receptor No. 1818
 - Table 10.4-3: Risk Driver Acute Non-Cancer Risk at PMI – Receptor No. 4910
 - Attachments
 - A1 – Residential Cancer Risk Isopleth: Entire Stationary Source View
 - A2 – Residential Cancer Risk Isopleth: Magnified View
 - B1 – Residential Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
 - B2 – Residential Chronic Non-Cancer Risk Isopleth: Magnified View of PMI and MEIR
 - B3 – Residential Chronic Non-Cancer Risk Isopleth: Magnified View of 1.0 Hazard Index Isopleth
 - C1 – Worker Cancer Risk Isopleth: Entire Stationary Source View
 - C2 – Worker Cancer Risk Isopleth: Magnified View
 - D1 – Worker Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
 - D2 – Worker Chronic Non-Cancer Risk Isopleth: Magnified View
 - E1 – Worker 8-Hour Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
 - E2 – Worker 8-Hour Chronic Non-Cancer Risk Isopleth: Magnified View
 - F – Acute Non-Cancer Risk Isopleth
 - Toxic Emissions and Modeling Files (Electronic Zipped)
 - Figures (Not part of the Santa Barbara Health Risk Assessment)
 - Buildings (Figure C-1)
 - Emission Sources (Figures C-2 and C-3)
 - Project Boundary Coordinate Points (Figure C-4)
- D. Santa Barbara County Air Pollution Control District’s Ambient Air Quality Analysis
- Tables

- Table 4.1: CEQA-Only Modeling Sources
 - Table 9.1: AAQS Modeling Results
 - Emission Calculations and Modeling Files (Electronic Zipped)
- E. Equipment Specifications
 - Detailed Equipment List
 - Steam Generator Specification
 - Flare Specification
 - Flow Meter Specification
 - Emergency Generator Specification
 - Miscellaneous Equipment
 - Fluid Throughput Measurement
 - SG Fuel Use Measurement
 - Sulfatreat® Monitoring and Media Replacement procedures
 - Gas Flaring Scenarios
- F. Material Safety Data Sheets
 - Amerlock 400
 - Amershield
 - Hempadur 15570
 - Hempadur 17369
 - Surftreat
 - Interseal 670

ATTACHMENT A

Emissions Calculations and Support Documents

- Equipment Listings and Schedules
 - Construction Emissions
 - Drilling Emissions
- Non-Stationary Source Operational Emissions
 - Stationary Source Operational Emissions
 - Emission Summaries

Equipment Listings and Schedules

- Construction Equipment Listing and Schedule
- Drilling and Well Hookup Equipment Listing and Schedule
 - Construction Equipment Horsepower
- Operations and Maintenance Vehicles and Equipment Listing

Construction Equipment Listing and Schedule

Activity	Year	Labor/Equipment	T	1	2	3	4	5	6	7	8	9	10	11	12
CPP,SP,GS, Office Grading	-2	Cat 815 Compactor	E	4	4										
CPP,SP,GS, Office Grading	-3	Cat 875 Challenger	E	1	1	1	1	1	1	2	2	1	1	1	1
CPP,SP,GS, Office Grading	-3	Cat D6	E	1	1	1	1	1	1	2	2	1	1	1	1
CPP,SP,GS, Office Grading	-3	Cat 14 Grader	E	1	1	1	1	1	1	2	2	1	1	1	1
CPP,SP,GS, Office Grading	-3	Cat 623 Water Wagon	E	1	1	1	1	1	1	2	2	1	1	1	1
CPP,SP,GS, Office Grading	-3	GENERATOR,6-10KW,DIESEL	E	1	1	1	1	1	1	2	2	1	1	1	1
CPP,SP,GS, Office Grading	-3	MECHANIC'S TRUCK,1.5 TON,2X4	E	1	1	1	1	1	1	2	2	1	1	1	1
CPP,SP,GS, Office Grading	-3	PICKUP,1/2 TON,2X4	E	2	2	2	2	2	2	4	4	2	2	2	2
CPP,SP,GS, Office Grading	-3	Cat 815 Compactor	E	4	4	4	4	4	4	8	8	4	4	4	4
Entrances	-2	CRANE,55-60 TON,HYDRAULIC,RT	E						1						
Entrances	-2	Cat D6	E								1				
Entrances	-2	Cat 14 Grader	E								1				
Entrances	-2	Cat 815 Compactor	E								1				
Entrances	-2	Cat 623 Water Wagon	E								1				
Entrances	-2	Cat D6	E						1	1					
Entrances	-2	Cat 14 Grader	E						1	1					
Entrances	-2	Cat 815 Compactor	E						1	1					
Entrances	-2	Cat 623 Water Wagon	E						1	1					
Entrances	-2	Cat 875 Challenger	E									2			
Entrances	-2	PICKUP,1/2 TON,2X4	E									2			
Entrances	-2	Cat D6	E			1	1	1							
Entrances	-2	Cat 14 Grader	E			1	1	1							
Entrances	-2	Cat 815 Compactor	E			1	1	1							
Entrances	-2	Cat 623 Water Wagon	E			1	1	1							
Entrances	-2	Cat 875 Challenger	E						2	2					
Entrances	-2	PICKUP,1/2 TON,2X4	E						2	2					
Entrances	-2	Cat 875 Challenger	E			2	2	2							
Entrances	-2	PICKUP,1/2 TON,2X4	E			2	2	2							
Fresh Water	-2	BACKHOE/LOADER,,75-1CY	E	1	1	1	1	1	1						
Fresh Water	-2	EXCAVATOR, 10-14K#,MINI	E	1	1	1	1	1	1						
Fresh Water	-2	COMPACTOR WHEEL ATTACHMENT,12-48"	E	1	1	1	1	1	1						
Fresh Water	-2	CRANE,10-14 TON,HYDRAULIC,RT	E	1	1	1	1	1	1						
Fresh Water	-2	FLATBED,1 TON,2X4,CREWCAB	E	1	1	1	1	1	1						
Fresh Water	-2	PICKUP,1/2 TON,2X4	E	2	2	2	2	2	2						
Gath-Dist	10	WHEEL LOADER,3.0-3.5CY	E	1	0	0	0	0	0	0	0	0	0	0	0
Gath-Dist	10	CAT 815 COMPACTOR	E	1	0	0	0	0	0	0	0	0	0	0	0
Gath-Dist	13	BACKHOE/LOADER,,75-1CY	E	0	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	15	BACKHOE/LOADER,,75-1CY	E	0	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	15	PICKUP,1/2 TON,4X4	E	0	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	15	PICKUP,3/4 TON,4X4	E	0	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	1	WHEEL LOADER,3.0-3.5CY	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	1	BACKHOE/LOADER,,75-1CY	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	1	CAT 815 COMPACTOR	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	7	WHEEL LOADER,3.0-3.5CY	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	7	BACKHOE/LOADER,,75-1CY	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	7	CAT 815 COMPACTOR	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	12	WHEEL LOADER,3.0-3.5CY	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	12	BACKHOE/LOADER,,75-1CY	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	12	CAT 815 COMPACTOR	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	13	WHEEL LOADER,3.0-3.5CY	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	13	CAT 815 COMPACTOR	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	15	WHEEL LOADER,3.0-3.5CY	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	15	CAT 815 COMPACTOR	E	1	1	0	0	0	0	0	0	0	0	0	0
Gath-Dist	11	WHEEL LOADER,3.0-3.5CY	E	1	1	1	0	0	0	0	0	0	0	0	0
Gath-Dist	11	BACKHOE/LOADER,,75-1CY	E	1	1	1	0	0	0	0	0	0	0	0	0
Gath-Dist	11	CAT 815 COMPACTOR	E	1	1	1	0	0	0	0	0	0	0	0	0
Gath-Dist	2	WHEEL LOADER,3.0-3.5CY	E	1	1	1	1	0	0	0	0	0	0	0	0
Gath-Dist	2	BACKHOE/LOADER,,75-1CY	E	1	1	1	1	0	0	0	0	0	0	0	0
Gath-Dist	2	CAT 815 COMPACTOR	E	1	1	1	1	0	0	0	0	0	0	0	0
Gath-Dist	16	WHEEL LOADER,3.0-3.5CY	E	1	1	1	1	0	0	0	0	0	0	0	0
Gath-Dist	16	BACKHOE/LOADER,,75-1CY	E	1	1	1	1	0	0	0	0	0	0	0	0
Gath-Dist	16	CAT 815 COMPACTOR	E	1	1	1	1	0	0	0	0	0	0	0	0
Gath-Dist	5	COMPACTOR,40-66" ROLLER,RIDE ON	E	1	1	1	1	1	1	0	0	0	0	0	0
Gath-Dist	5	WHEEL LOADER,3.0-3.5CY	E	1	1	1	1	1	1	0	0	0	0	0	0
Gath-Dist	5	CAT 815 COMPACTOR	E	1	1	1	1	1	1	0	0	0	0	0	0
Gath-Dist	10	BOOMTRUCK,10-13 TON	E	0	1	1	1	1	1	1	1	0	0	0	0
Gath-Dist	10	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	1	1	1	1	1	1	1	0	0	0	0

Construction Equipment Listing and Schedule

Activity	Year	Labor/Equipment	T	1	2	3	4	5	6	7	8	9	10	11	12
Gath-Dist	13	PICKUP,1/2 TON,4X4	E	0	1	1	1	1	1	1	1	0	0	0	0
Gath-Dist	13	PICKUP,3/4 TON,4X4	E	0	1	1	1	1	1	1	1	0	0	0	0
Gath-Dist	15	BOOMTRUCK,10-13 TON	E	0	2	1	1	1	1	1	1	0	0	0	0
Gath-Dist	15	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	2	1	1	1	1	1	1	0	0	0	0
Gath-Dist	-1	COMPACTOR,40-66" ROLLER,RIDE ON	E	1	1	1	1	1	1	1	1	1	0	0	0
Gath-Dist	-1	WHEEL LOADER,3.0-3.5CY	E	1	1	1	1	1	1	1	1	1	0	0	0
Gath-Dist	-1	CAT 815 COMPACTOR	E	1	1	1	1	1	1	1	1	1	0	0	0
Gath-Dist	5	BACKHOE/LOADER,,75-1CY	E	1	2	2	2	1	1	0	0	0	0	0	0
Gath-Dist	7	PICKUP,1/2 TON,4X4	E	1	2	1	1	1	1	1	1	0	0	0	0
Gath-Dist	7	PICKUP,3/4 TON,4X4	E	1	2	1	1	1	1	1	1	0	0	0	0
Gath-Dist	12	PICKUP,1/2 TON,4X4	E	1	2	1	1	1	1	1	1	0	0	0	0
Gath-Dist	12	PICKUP,3/4 TON,4X4	E	1	2	1	1	1	1	1	1	0	0	0	0
Gath-Dist	13	BOOMTRUCK,10-13 TON	E	0	2	2	1	1	1	1	1	0	0	0	0
Gath-Dist	13	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	2	2	1	1	1	1	1	0	0	0	0
Gath-Dist	11	PICKUP,1/2 TON,4X4	E	1	2	2	1	1	1	1	1	0	0	0	0
Gath-Dist	11	PICKUP,3/4 TON,4X4	E	1	2	2	1	1	1	1	1	0	0	0	0
Gath-Dist	7	BOOMTRUCK,10-13 TON	E	0	2	2	2	2	1	1	1	0	0	0	0
Gath-Dist	7	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	2	2	2	2	1	1	1	0	0	0	0
Gath-Dist	11	BOOMTRUCK,10-13 TON	E	0	2	2	2	2	2	1	1	0	0	0	0
Gath-Dist	11	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	2	2	2	2	2	1	1	0	0	0	0
Gath-Dist	12	BOOMTRUCK,10-13 TON	E	0	2	2	2	2	2	1	1	0	0	0	0
Gath-Dist	12	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	2	2	2	2	2	1	1	0	0	0	0
Gath-Dist	1	PICKUP,1/2 TON,4X4	E	1	3	2	2	2	2	2	2	0	0	0	0
Gath-Dist	1	PICKUP,3/4 TON,4X4	E	1	3	2	2	2	2	2	2	0	0	0	0
Gath-Dist	2	BOOMTRUCK,10-13 TON	E	0	3	3	3	2	2	2	2	0	0	0	0
Gath-Dist	2	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	3	3	3	2	2	2	2	0	0	0	0
Gath-Dist	1	BOOMTRUCK,10-13 TON	E	0	3	3	3	3	2	2	2	0	0	0	0
Gath-Dist	1	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	3	3	3	3	2	2	2	0	0	0	0
Gath-Dist	2	PICKUP,1/2 TON,4X4	E	1	3	3	3	2	2	2	2	0	0	0	0
Gath-Dist	2	PICKUP,3/4 TON,4X4	E	1	3	3	3	2	2	2	2	0	0	0	0
Gath-Dist	16	BOOMTRUCK,10-13 TON	E	0	3	3	3	3	3	3	2	0	0	0	0
Gath-Dist	16	PICKUP,1/2 TON,4X4	E	1	4	4	4	3	3	3	3	0	0	0	0
Gath-Dist	16	PICKUP,3/4 TON,4X4	E	1	4	4	4	3	3	3	3	0	0	0	0
Gath-Dist	16	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	4	4	4	4	4	4	3	0	0	0	0
Gath-Dist	5	BOOMTRUCK,10-13 TON	E	0	4	4	4	3	3	3	3	3	0	0	0
Gath-Dist	-1	BACKHOE/LOADER,,75-1CY	E	4	5	5	5	5	4	4	4	4	0	0	0
Gath-Dist	-1	BOOMTRUCK,10-13 TON	E	0	4	4	4	4	4	4	4	4	4	4	0
Gath-Dist	5	PICKUP,1/2 TON,4X4	E	1	5	5	5	5	5	5	5	5	0	0	0
Gath-Dist	5	PICKUP,3/4 TON,4X4	E	1	5	5	5	5	5	5	5	5	0	0	0
Gath-Dist	5	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	7	7	7	7	6	6	6	6	6	0	0
Gath-Dist	-1	PICKUP,1/2 TON,4X4	E	1	6	6	6	7	7	7	7	7	7	7	0
Gath-Dist	-1	PICKUP,3/4 TON,4X4	E	1	6	6	6	7	7	7	7	7	7	7	0
Gath-Dist	-1	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	8	8	8	8	8	8	8	8	7	7	0
Misc Piping	5	WHEEL LOADER,3.0-3.5CY	E	1	1	1	0	0	0	0	0	0	0	0	0
Misc Piping	5	BACKHOE/LOADER,,75-1CY	E	1	1	1	0	0	0	0	0	0	0	0	0
Misc Piping	5	CAT 815 COMPACTOR	E	1	1	1	0	0	0	0	0	0	0	0	0
Misc Piping	-1	COMPACTOR,40-66" ROLLER,RIDE ON	E	1	1	1	1	1	1	1	0	0	0	0	0
Misc Piping	-1	WHEEL LOADER,3.0-3.5CY	E	1	1	1	1	1	1	1	0	0	0	0	0
Misc Piping	-1	CAT 815 COMPACTOR	E	1	1	1	1	1	1	1	0	0	0	0	0
Misc Piping	-1	BACKHOE/LOADER,,75-1CY	E	1	2	2	2	2	2	2	0	0	0	0	0
Misc Piping	5	PICKUP,1/2 TON,4X4	E	1	2	2	2	2	2	1	1	0	0	0	0
Misc Piping	5	PICKUP,3/4 TON,4X4	E	1	2	2	2	2	2	1	1	0	0	0	0
Misc Piping	5	BOOMTRUCK,10-13 TON	E	0	2	2	2	2	2	2	2	0	0	0	0
Misc Piping	5	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	2	2	2	2	2	2	2	0	0	0	0
Misc Piping	-1	BOOMTRUCK,10-13 TON	E	0	4	4	3	3	3	3	3	3	0	0	0
Misc Piping	-1	PICKUP,1/2 TON,4X4	E	1	5	5	5	5	5	5	4	4	0	0	0
Misc Piping	-1	PICKUP,3/4 TON,4X4	E	1	5	5	5	5	5	5	4	4	0	0	0
Misc Piping	-1	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	6	6	6	6	6	6	6	5	0	0	0
Pads and Roads	7	Cat 875 Challenger	E	0	0	0	0	0	0	0	0	1	1	0	0
Pads and Roads	7	Cat D6	E	0	0	0	0	0	0	0	0	1	1	0	0
Pads and Roads	7	Cat 14 Grader	E	0	0	0	0	0	0	0	0	1	1	0	0
Pads and Roads	7	Cat 623 Water Wagon	E	0	0	0	0	0	0	0	0	1	1	0	0
Pads and Roads	11	Cat 875 Challenger	E	0	0	0	0	0	0	0	0	1	1	0	0
Pads and Roads	11	Cat D6	E	0	0	0	0	0	0	0	0	1	1	0	0
Pads and Roads	11	Cat 14 Grader	E	0	0	0	0	0	0	0	0	1	1	0	0
Pads and Roads	11	Cat 623 Water Wagon	E	0	0	0	0	0	0	0	0	1	1	0	0
Pads and Roads	15	Cat 875 Challenger	E	0	0	0	0	0	0	0	0	1	1	0	0

Construction Equipment Listing and Schedule

Activity	Year	Labor/Equipment	T	1	2	3	4	5	6	7	8	9	10	11	12
Pads and Roads	5	MECHANIC'S TRUCK,1.5 TON,2X4	E	2	2	2	2	2	2	2	2	2	2	2	2
Pads and Roads	16	Cat 815 Compactor	E	0	0	0	4	4	4	4	4	4	4	0	0
Pads and Roads	-2	Cat 815 Compactor	E	0	0	4	4	4	4	4	4	4	0	0	0
Pads and Roads	-1	Cat 815 Compactor	E	0	0	4	4	4	4	4	4	4	0	0	0
Pads and Roads	5	PICKUP,1/2 TON,2X4	E	3	3	3	3	3	3	3	3	3	3	3	3
Pads and Roads	5	Cat 815 Compactor	E	7	7	7	7	7	7	7	7	7	7	7	7
Power	4	BOOMTRUCK,23-28 TON	E					1							
Power	4	TRAILER,POLE	E					1							
Power	4	TRUCK,2 TON,2X4,BUCKET	E					1							
Power	4	TRUCK,2 TON,2X4,DIGGER	E					1							
Power	4	PICKUP,3/4 TON,4X4,CREWCAB	E					1							
Power	11	BOOMTRUCK,23-28 TON	E					1							
Power	11	TRAILER,POLE	E					1							
Power	11	TRAILER,CABLE PULLER,20-30K PULL	E					1							
Power	11	TRUCK,2 TON,2X4,DIGGER	E					1							
Power	11	UTILITY TRUCK,1 TON Cable Tensioner	E					1							
Power	12	BOOMTRUCK,23-28 TON	E					1							
Power	12	TRAILER,POLE	E					1							
Power	12	TRAILER,CABLE PULLER,20-30K PULL	E					1							
Power	12	TRUCK,2 TON,2X4,DIGGER	E					1							
Power	12	UTILITY TRUCK,1 TON Cable Tensioner	E					1							
Power	13	BOOMTRUCK,23-28 TON	E					1							
Power	13	TRAILER,POLE	E					1							
Power	13	TRAILER,CABLE PULLER,20-30K PULL	E					1							
Power	13	TRUCK,2 TON,2X4,DIGGER	E					1							
Power	13	UTILITY TRUCK,1 TON Cable Tensioner	E					1							
Power	14	BOOMTRUCK,23-28 TON	E					1							
Power	14	TRAILER,POLE	E					1							
Power	14	TRAILER,CABLE PULLER,20-30K PULL	E					1							
Power	14	TRUCK,2 TON,2X4,DIGGER	E					1							
Power	14	UTILITY TRUCK,1 TON Cable Tensioner	E					1							
Power	15	BOOMTRUCK,23-28 TON	E					1							
Power	15	TRAILER,POLE	E					1							
Power	15	TRAILER,CABLE PULLER,20-30K PULL	E					1							
Power	15	TRUCK,2 TON,2X4,DIGGER	E					1							
Power	15	UTILITY TRUCK,1 TON Cable Tensioner	E					1							
Power	16	BOOMTRUCK,23-28 TON	E					1							
Power	16	TRAILER,POLE	E					1							
Power	16	TRAILER,CABLE PULLER,20-30K PULL	E					1							
Power	16	TRUCK,2 TON,2X4,DIGGER	E					1							
Power	16	UTILITY TRUCK,1 TON Cable Tensioner	E					1							
Power	17	BOOMTRUCK,23-28 TON	E					1							
Power	17	TRAILER,POLE	E					1							
Power	17	TRAILER,CABLE PULLER,20-30K PULL	E					1							
Power	17	TRUCK,2 TON,2X4,DIGGER	E					1							
Power	17	UTILITY TRUCK,1 TON Cable Tensioner	E					1							
Power	18	BOOMTRUCK,23-28 TON	E					1							
Power	18	TRAILER,POLE	E					1							
Power	18	TRAILER,CABLE PULLER,20-30K PULL	E					1							
Power	18	TRUCK,2 TON,2X4,DIGGER	E					1							
Power	18	UTILITY TRUCK,1 TON Cable Tensioner	E					1							
Power	5	BOOMTRUCK,23-28 TON	E					1	1						
Power	5	TRAILER,POLE	E					1	1						
Power	5	TRAILER,CABLE PULLER,20-30K PULL	E					1	1						
Power	5	TRUCK,2 TON,2X4,DIGGER	E					1	1						
Power	5	UTILITY TRUCK,1 TON Cable Tensioner	E					1	1						
Power	6	BOOMTRUCK,23-28 TON	E					1	1						
Power	6	TRAILER,POLE	E					1	1						
Power	6	TRAILER,CABLE PULLER,20-30K PULL	E					1	1						
Power	6	TRUCK,2 TON,2X4,DIGGER	E					1	1						
Power	6	PICKUP,3/4 TON,4X4,DIESEL,SUPERCAB	E					1	1						
Power	6	UTILITY TRUCK,1 TON Cable Tensioner	E					1	1						
Power	9	BOOMTRUCK,23-28 TON	E					1	1						
Power	9	TRAILER,POLE	E					1	1						
Power	9	TRAILER,CABLE PULLER,20-30K PULL	E					1	1						
Power	9	TRUCK,2 TON,2X4,DIGGER	E					1	1						
Power	9	UTILITY TRUCK,1 TON Cable Tensioner	E					1	1						

Construction Equipment Listing and Schedule

Activity	Year	Labor/Equipment	T	1	2	3	4	5	6	7	8	9	10	11	12
Power	10	BOOMTRUCK,23-28 TON	E					1	1						
Power	10	TRAILER,POLE	E					1	1						
Power	10	TRAILER,CABLE PULLER,20-30K PULL	E					1	1						
Power	10	TRUCK,2 TON,2X4,DIGGER	E					1	1						
Power	10	UTILITY TRUCK,1 TON Cable Tensioner	E					1	1						
Power	11	TRUCK,2 TON,2X4,BUCKET	E					2							
Power	11	PICKUP,3/4 TON,4X4,CREWCAB	E					2							
Power	12	TRUCK,2 TON,2X4,BUCKET	E					2							
Power	12	PICKUP,3/4 TON,4X4,CREWCAB	E					2							
Power	13	TRUCK,2 TON,2X4,BUCKET	E					2							
Power	13	PICKUP,3/4 TON,4X4,CREWCAB	E					2							
Power	14	TRUCK,2 TON,2X4,BUCKET	E					2							
Power	14	PICKUP,3/4 TON,4X4,CREWCAB	E					2							
Power	15	TRUCK,2 TON,2X4,BUCKET	E					2							
Power	15	PICKUP,3/4 TON,4X4,CREWCAB	E					2							
Power	16	TRUCK,2 TON,2X4,BUCKET	E					2							
Power	16	PICKUP,3/4 TON,4X4,CREWCAB	E					2							
Power	17	TRUCK,2 TON,2X4,BUCKET	E					2							
Power	17	PICKUP,3/4 TON,4X4,CREWCAB	E					2							
Power	18	TRUCK,2 TON,2X4,BUCKET	E					2							
Power	18	PICKUP,3/4 TON,4X4,CREWCAB	E					2							
Power	1	BOOMTRUCK,23-28 TON	E					1	1	1					
Power	1	TRAILER,POLE	E					1	1	1					
Power	1	TRAILER,CABLE PULLER,20-30K PULL	E					1	1	1					
Power	1	TRUCK,2 TON,2X4,DIGGER	E					1	1	1					
Power	1	UTILITY TRUCK,1 TON Cable Tensioner	E					1	1	1					
Power	2	BOOMTRUCK,23-28 TON	E					1	1	1					
Power	2	TRAILER,POLE	E					1	1	1					
Power	2	TRAILER,CABLE PULLER,20-30K PULL	E					1	1	1					
Power	2	TRUCK,2 TON,2X4,DIGGER	E					1	1	1					
Power	2	UTILITY TRUCK,1 TON Cable Tensioner	E					1	1	1					
Power	3	BOOMTRUCK,23-28 TON	E					1	1	1					
Power	3	TRAILER,POLE	E					1	1	1					
Power	3	TRAILER,CABLE PULLER,20-30K PULL	E					1	1	1					
Power	3	TRUCK,2 TON,2X4,DIGGER	E					1	1	1					
Power	3	UTILITY TRUCK,1 TON Cable Tensioner	E					1	1	1					
Power	5	TRUCK,2 TON,2X4,BUCKET	E					2	2						
Power	5	PICKUP,3/4 TON,4X4,CREWCAB	E					2	2						
Power	6	TRUCK,2 TON,2X4,BUCKET	E					2	2						
Power	6	PICKUP,3/4 TON,4X4,CREWCAB	E					2	2						
Power	9	TRUCK,2 TON,2X4,BUCKET	E					2	2						
Power	9	PICKUP,3/4 TON,4X4,CREWCAB	E					2	2						
Power	10	TRUCK,2 TON,2X4,BUCKET	E					2	2						
Power	10	PICKUP,3/4 TON,4X4,CREWCAB	E					2	2						
Power	-1	BOOMTRUCK,23-28 TON	E					1	1	1	1	1			
Power	-1	TRAILER,POLE	E					1	1	1	1	1			
Power	-1	TRAILER,CABLE PULLER,20-30K PULL	E					1	1	1	1	1			
Power	-1	TRUCK,2 TON,2X4,DIGGER	E					1	1	1	1	1			
Power	-1	UTILITY TRUCK,1 TON Cable Tensioner	E					1	1	1	1	1			
Power	1	TRUCK,2 TON,2X4,BUCKET	E					2	2	2					
Power	1	PICKUP,3/4 TON,4X4,CREWCAB	E					2	2	2					
Power	2	TRUCK,2 TON,2X4,BUCKET	E					2	2	2					
Power	2	PICKUP,3/4 TON,4X4,CREWCAB	E					2	2	2					
Power	3	TRUCK,2 TON,2X4,BUCKET	E					2	2	2					
Power	3	PICKUP,3/4 TON,4X4,CREWCAB	E					2	2	2					
Power	-1	PICKUP,3/4 TON,4X4,CREWCAB	E					2	2	2	2	2			
Power	-1	TRUCK,2 TON,2X4,BUCKET	E					3	3	3	3	3			
Steam Gen	-1	MANLIFT,40' RT,GAS OR DSL	E												1
Steam Gen	-1	PIPE BEVELER,14-42",FLEX BAND,ELECTRIC	E												1
Steam Gen	4	MANLIFT,40' RT,GAS OR DSL	E											1	
Steam Gen	4	PIPE BEVELER,14-42",FLEX BAND,ELECTRIC	E											1	
Steam Gen	-1	COMPACTOR,40-66" ROLLER,RIDE ON	E							1	1				
Steam Gen	-1	POWER TROWEL,36"-48",GAS	E							1	1				
Steam Gen	-1	REBAR BENDER,#2-#8 BAR ELEC	E					1	1						
Steam Gen	-1	TROWEL,36-48",WALK BEHIND	E							1	1				
Steam Gen	-1	CONCRETE VIBRATOR,HEAVY DUTY	E							1	1				
Steam Gen	-1	WHEEL LOADER,3.5-4.0CY	E							1	1				

Construction Equipment Listing and Schedule

Activity	Year	Labor/Equipment	T	1	2	3	4	5	6	7	8	9	10	11	12
Steam Gen	-1	BACKHOE/LOADER,1.25-1.50CY	E							1	1				
Steam Gen	-1	CRANE,10-14 TON,HYDRAULIC,RT	E									1	1		
Steam Gen	-1	CUTTING TORCH,FLEX TRACK,MAG	E												2
Steam Gen	-1	CONDUIT BENDER,1/2-2",ELECTRIC	E											1	1
Steam Gen	4	POWER TROWEL,36"-48",GAS	E						1	1					
Steam Gen	4	REBAR BENDER,#2-#8 BAR ELEC	E				1	1							
Steam Gen	4	TROWEL,36-48", WALK BEHIND	E						1	1					
Steam Gen	4	CONCRETE VIBRATOR,HEAVY DUTY	E						1	1					
Steam Gen	4	EXCAVATOR, 10-14K#,MINI	E	1	1										
Steam Gen	4	EXCAVATOR,50-60K#	E	1	1										
Steam Gen	4	CRANE,10-14 TON,HYDRAULIC,RT	E								1	1			
Steam Gen	4	CUTTING TORCH,FLEX TRACK,MAG	E												2
Steam Gen	4	CONDUIT BENDER,1/2-2",ELECTRIC	E										1	1	
Steam Gen	-1	WELDER,250-300 AMP DIESEL	E												3
Steam Gen	4	WELDER,250-300 AMP DIESEL	E											3	
Steam Gen	-1	TAMPER,100-150#	E							2	2				
Steam Gen	-1	FLATBED,1.5 TON,4X4	E					1					1	1	1
Steam Gen	4	WHEEL LOADER,3.5-4.0CY	E	1	1				1	1					
Steam Gen	-1	PICKUP,1/2 TON,4X4,SUPERCAB	E					1	1				1	1	1
Steam Gen	4	COMPACTOR,40-66" ROLLER,RIDE ON	E	2	2				1	1					
Steam Gen	4	BACKHOE/LOADER,1.25-1.50CY	E	2	2				1	1					
Steam Gen	4	FLATBED,1.5 TON,4X4	E	1	1	1						1	1	1	
Steam Gen	4	PICKUP,1/2 TON,4X4,SUPERCAB	E	1	1	1	1					1	1	1	
Steam Gen	4	TAMPER,100-150#	E	2	2				2	2					
Steam Gen	-1	COMPRESSOR,100-200 CFM,DIESEL	E					1	1	1	1	1	1	1	1
Steam Gen	-1	GENERATOR,6-10KW,DIESEL	E					1	1	1	1	1	1	1	1
Steam Gen	4	COMPRESSOR,100-200 CFM,DIESEL	E		1	1	1	1	1	1	1	1	1	1	1
Steam Gen	4	GENERATOR,6-10KW,DIESEL	E	1	1	1	1	1	1	1	1	1	1	1	1
Steam Gen	4	PICKUP,1/2 TON,2X4	E	2	3	3	2	2	2	2	2	2	2	2	2
Steam Gen	-1	PICKUP,1/2 TON,2X4	E	2	2	2	3	2	2	2	2	2	2	2	2
Substation	-3	BORING SYSTEM,30-36", AUGER,DIESEL	E				0.2								
Substation	-3	CRANE,70-79 TON,HYDRAULIC,RT	E							0.3					
Substation	-3	TRUCK,3/4 TON,2X4,ELECT. MAINT	E							0.3					
Substation	-3	COMPACTOR,24-33" ROLLER,WALKBEHIND	E				0.5								
Substation	-3	TRENCHER,3-5'	E					0.5							
Substation	-3	MANLIFT,60' RT,GAS OR DSL	E							0.3	0.3				
Substation	-3	MORTAR MIXER,6-9 CU FT	E				1								
Substation	-3	REBAR BENDER,#2-#8 BAR ELEC	E				1								
Substation	-3	CONCRETE VIBRATOR,HEAVY DUTY	E				1								
Substation	-3	MANLIFT,40' RT,GAS OR DSL	E						0.3	0.5	0.3				
Substation	-3	LOADER,SKIDSTEER 36-45HP	E				1	1							
Substation	-3	BACKHOE/LOADER,1-1.25CY	E				1	1							
Substation	-3	FORKLIFT,7-9K#,YARD	E				1	1							
Substation	-3	COMPRESSOR,100-200 CFM,DIESEL	E				1	1	1						
Substation	-3	PICKUP,3/4 TON,4X4,CREWCAB	E						1	1	1				
Substation	-3	PICKUP,1/2 TON,2X4,CREWCAB	E				2	2							
Substation	-3	GENERATOR,5-7KW,GASOLINE	E				2	2	2	1					

Drilling	4	Wireline Truck	E	0	0	0	0	0	0	0	0	0	0	0	36	0	0
Drilling	4	Vaccum Truck	E	0	0	0	0	0	0	0	0	0	0	0	144	0	0
Hookups	5	BACKHOE/LOADER,1.25-1.50CY	E	76	76	76	76	76	76	76	76	76	76	76	76	76	76
Hookups	5	TRUCK,1.5 TON,2X4,W/CRANE	E	115	115	115	115	115	115	115	115	115	115	115	115	115	115
Hookups	5	TRUCK,2.5 TON,2X4,A-FRAME	E	147	147	147	147	147	147	147	147	147	147	147	147	147	147
Hookups	5	PICKUP,3/4 TON,4X4,CREWCAB	E	223	223	223	223	223	223	223	223	223	223	223	223	223	223
Hookups	5	CRANE,2.5 TON,HYDRAULIC,RT	E	155	155	155	155	155	155	155	155	155	155	155	155	155	155
Hookups	5	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	227	227	227	227	227	227	227	227	227	227	227	227	227	227
Hookups	5	CRANE,55-60 TON,HYDRAULIC,RT	E	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Hookups	5	ROAD TRACTOR,4X6	E	119	119	119	119	119	119	119	119	119	119	119	119	119	119
Hookups	5	FLATBED,1.5 TON,2X4,CREWCAB	E	119	119	119	119	119	119	119	119	119	119	119	119	119	119
Drilling	5	Generator Engine Run Time	E	1454	1454	1454	1454	1454	1454	1454	1454	1454	1454	1454	1454	1454	1454
Drilling	5	Mud Pump Engine Run Time	E	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081
Drilling	5	F250 Pickup	E	849	849	849	849	849	849	849	849	849	849	849	849	849	849
Drilling	5	Cement Pump Truck	E	136	136	136	136	136	136	136	136	136	136	136	136	136	136
Drilling	5	Cement Bulk Truck	E	136	136	136	136	136	136	136	136	136	136	136	136	136	136
Drilling	5	Wireline Truck	E	136	136	136	136	136	136	136	136	136	136	136	136	136	136
Drilling	5	Vaccum Truck	E	544	544	544	544	544	544	544	544	544	544	544	544	544	544
Hookups	6	BACKHOE/LOADER,1.25-1.50CY	E	0	0	0	0	0	0	0	0	0	0	20	20	0	0
Hookups	6	TRUCK,1.5 TON,2X4,W/CRANE	E	0	0	0	0	0	0	0	0	0	0	30	30	0	0
Hookups	6	TRUCK,2.5 TON,2X4,A-FRAME	E	0	0	0	0	0	0	0	0	0	0	40	40	0	0
Hookups	6	PICKUP,3/4 TON,4X4,CREWCAB	E	0	0	0	0	0	0	0	0	0	0	60	60	0	0
Hookups	6	CRANE,2.5 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	0	0	0	0	40	40	0	0
Hookups	6	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	0	0	0	0	0	0	0	0	0	60	60	0	0
Hookups	6	CRANE,55-60 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	0	0	0	0	10	10	0	0
Hookups	6	ROAD TRACTOR,4X6	E	0	0	0	0	0	0	0	0	0	0	30	30	0	0
Hookups	6	FLATBED,1.5 TON,2X4,CREWCAB	E	0	0	0	0	0	0	0	0	0	0	30	30	0	0
Drilling	6	Generator Engine Run Time	E	0	0	0	0	0	0	0	0	0	0	384	384	0	0
Drilling	6	Mud Pump Engine Run Time	E	0	0	0	0	0	0	0	0	0	0	286	286	0	0
Drilling	6	F250 Pickup	E	0	0	0	0	0	0	0	0	0	0	225	225	0	0
Drilling	6	Cement Pump Truck	E	0	0	0	0	0	0	0	0	0	0	36	36	0	0
Drilling	6	Cement Bulk Truck	E	0	0	0	0	0	0	0	0	0	0	36	36	0	0
Drilling	6	Wireline Truck	E	0	0	0	0	0	0	0	0	0	0	36	36	0	0
Drilling	6	Vaccum Truck	E	0	0	0	0	0	0	0	0	0	0	144	144	0	0
Hookups	7	BACKHOE/LOADER,1.25-1.50CY	E	0	0	0	0	0	30	30	30	30	30	30	0	0	0
Hookups	7	TRUCK,1.5 TON,2X4,W/CRANE	E	0	0	0	0	0	47	47	47	47	47	47	0	0	0
Hookups	7	TRUCK,2.5 TON,2X4,A-FRAME	E	0	0	0	0	0	58	58	58	58	58	58	0	0	0
Hookups	7	PICKUP,3/4 TON,4X4,CREWCAB	E	0	0	0	0	0	89	89	89	89	89	89	0	0	0
Hookups	7	CRANE,2.5 TON,HYDRAULIC,RT	E	0	0	0	0	0	63	63	63	63	63	63	0	0	0
Hookups	7	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	0	0	0	0	91	91	91	91	91	91	0	0	0
Hookups	7	CRANE,55-60 TON,HYDRAULIC,RT	E	0	0	0	0	0	16	16	16	16	16	16	0	0	0
Hookups	7	ROAD TRACTOR,4X6	E	0	0	0	0	0	49	49	49	49	49	49	0	0	0
Hookups	7	FLATBED,1.5 TON,2X4,CREWCAB	E	0	0	0	0	0	49	49	49	49	49	49	0	0	0
Drilling	7	Generator Engine Run Time	E	0	0	0	0	0	587	587	587	587	587	587	0	0	0
Drilling	7	Mud Pump Engine Run Time	E	0	0	0	0	0	436	436	436	436	436	436	0	0	0
Drilling	7	F250 Pickup	E	0	0	0	0	0	342	342	342	342	342	342	0	0	0
Drilling	7	Cement Pump Truck	E	0	0	0	0	0	55	55	55	55	55	55	0	0	0
Drilling	7	Cement Bulk Truck	E	0	0	0	0	0	55	55	55	55	55	55	0	0	0
Drilling	7	Wireline Truck	E	0	0	0	0	0	55	55	55	55	55	55	0	0	0
Drilling	7	Vaccum Truck	E	0	0	0	0	0	219	219	219	219	219	219	0	0	0
Hookups	8	BACKHOE/LOADER,1.25-1.50CY	E	0	0	0	0	0	0	0	0	0	0	30	30	0	0
Hookups	8	TRUCK,1.5 TON,2X4,W/CRANE	E	0	0	0	0	0	0	0	0	0	0	50	50	0	0
Hookups	8	TRUCK,2.5 TON,2X4,A-FRAME	E	0	0	0	0	0	0	0	0	0	0	50	50	0	0
Hookups	8	PICKUP,3/4 TON,4X4,CREWCAB	E	0	0	0	0	0	0	0	0	0	0	80	80	0	0
Hookups	8	CRANE,2.5 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	0	0	0	0	70	70	0	0
Hookups	8	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	0	0	0	0	0	0	0	0	0	90	90	0	0
Hookups	8	CRANE,55-60 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	0	0	0	0	20	20	0	0
Hookups	8	ROAD TRACTOR,4X6	E	0	0	0	0	0	0	0	0	0	0	60	60	0	0
Hookups	8	FLATBED,1.5 TON,2X4,CREWCAB	E	0	0	0	0	0	0	0	0	0	0	60	60	0	0
Drilling	8	Generator Engine Run Time	E	0	0	0	0	0	0	0	0	0	0	588	588	0	0
Drilling	8	Mud Pump Engine Run Time	E	0	0	0	0	0	0	0	0	0	0	437	437	0	0
Drilling	8	F250 Pickup	E	0	0	0	0	0	0	0	0	0	0	337	337	0	0
Drilling	8	Cement Pump Truck	E	0	0	0	0	0	0	0	0	0	0	54	54	0	0
Drilling	8	Cement Bulk Truck	E	0	0	0	0	0	0	0	0	0	0	54	54	0	0
Drilling	8	Wireline Truck	E	0	0	0	0	0	0	0	0	0	0	54	54	0	0
Drilling	8	Vaccum Truck	E	0	0	0	0	0	0	0	0	0	0	216	216	0	0
Hookups	9	BACKHOE/LOADER,1.25-1.50CY	E	0	0	0	0	0	0	0	0	0	0	25	25	0	0
Hookups	9	TRUCK,1.5 TON,2X4,W/CRANE	E	0	0	0	0	0	0	0	0	0	0	45	45	0	0
Hookups	9	TRUCK,2.5 TON,2X4,A-FRAME	E	0	0	0	0	0	0	0	0	0	0	35	35	0	0
Hookups	9	PICKUP,3/4 TON,4X4,CREWCAB	E	0	0	0	0	0	0	0	0	0	0	60	60	0	0
Hookups	9	CRANE,2.5 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	0	0	0	0	65	65	0	0
Hookups	9	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	0	0	0	0	0	0	0	0	0	75	75	0	0
Hookups	9	CRANE,55-60 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	0	0	0	0	20	20	0	0
Hookups	9	ROAD TRACTOR,4X6	E	0	0	0	0	0	0	0	0	0	0	60	60	0	0
Hookups	9	FLATBED,1.5 TON,2X4,CREWCAB	E	0	0	0	0	0	0	0	0	0	0	60	60	0	0
Drilling	9	Generator Engine Run Time	E	0	0	0	0	0	0	0	0	0	0	498	498	0	0
Drilling	9	Mud Pump Engine Run Time	E	0	0	0	0	0	0	0	0	0	0	370	370	0	0
Drilling	9	F250 Pickup	E	0	0	0	0	0	0	0	0	0	0	281	281	0	0
Drilling	9	Cement Pump Truck	E	0	0	0	0	0	0	0	0	0	0	45	45	0	0
Drilling	9	Cement Bulk Truck	E	0	0	0	0	0	0	0	0	0	0	45	45	0	0
Drilling	9	Wireline Truck	E	0	0	0	0	0	0	0	0	0	0	45	45	0	0
Drilling	9	Vaccum Truck	E	0	0	0	0	0	0	0	0	0	0	180	180	0	0
Hookups	10	BACKHOE/LOADER,1.25-1.50CY	E	0	0	0	0	0	0	35	35	35	35	35	0	0	0
Hookups	10	TRUCK,1.5 TON,2X4,W/CRANE	E	0	0	0	0	0	0	55	55	55	55	55	0	0	0
Hookups	10	TRUCK,2.5 TON,2X4,A-FRAME	E	0	0	0	0	0	0	65	65	65	65	65	0	0	0
Hookups	10	PICKUP,3/4 TON,4X4,CREWCAB	E	0	0	0	0	0	0	100	100	100	100	100	0	0	0
Hookups	10	CRANE,2.5 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	74	74	74	74	74	0	0	0
Hookups	10	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	0	0	0	0	0	104	104	104	104	104	0	0	0
Hookups	10	CRANE,55-60 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	20	20	20	20	20	0	0	0
Hookups	10	ROAD TRACTOR,4X6	E	0	0	0	0	0	0	59	59	59	59	59	0	0	0
Hookups	10	FLATBED,1.5 TON,2X4,CREWCAB	E	0	0	0	0	0	0	59	59	59	59	59	0	0	0
Drilling	10	Generator Engine Run Time	E	0	0	0	0	0	0	673	673	673	673	673	0	0	0
Drilling	10	Mud Pump Engine Run Time	E	0	0	0	0	0	0	500	500	500	500	500	0	0	0
Drilling	10	F250 Pickup	E	0	0	0	0	0	0	391	391	391	391	391	0	0	0
Drilling	10	Cement Pump Truck	E	0	0	0	0										

Hookups	29	TRUCK,2.5 TON,2X4,A-FRAME	E	0	0	0	0	0	0	0	0	35	35	0	0
Hookups	29	PICKUP,3/4 TON,4X4,CREWCAB	E	0	0	0	0	0	0	0	0	70	70	0	0
Hookups	29	CRANE,2.5 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	0	0	105	105	0	0
Hookups	29	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	0	0	0	0	0	0	0	105	105	0	0
Hookups	29	CRANE,55-60 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	0	0	35	35	0	0
Hookups	29	ROAD TRACTOR,4X6	E	0	0	0	0	0	0	0	0	105	105	0	0
Hookups	29	FLATBED,1.5 TON,2X4,CREWCAB	E	0	0	0	0	0	0	0	0	105	105	0	0
Drilling	29	Generator Engine Run Time	E	0	0	0	0	0	0	0	0	714	714	0	0
Drilling	29	Mud Pump Engine Run Time	E	0	0	0	0	0	0	0	0	529	529	0	0
Drilling	29	F250 Pickup	E	0	0	0	0	0	0	0	0	394	394	0	0
Drilling	29	Cement Pump Truck	E	0	0	0	0	0	0	0	0	63	63	0	0
Drilling	29	Cement Bulk Truck	E	0	0	0	0	0	0	0	0	63	63	0	0
Drilling	29	Wireline Truck	E	0	0	0	0	0	0	0	0	63	63	0	0
Drilling	29	Vaccum Truck	E	0	0	0	0	0	0	0	0	252	252	0	0
Hookups	30	BACKHOE/LOADER,1.25-1.50CY	E	0	0	0	0	0	0	0	0	35	35	0	0
Hookups	30	TRUCK,1.5 TON,2X4,W/CRANE	E	0	0	0	0	0	0	0	0	70	70	0	0
Hookups	30	TRUCK,2.5 TON,2X4,A-FRAME	E	0	0	0	0	0	0	0	0	35	35	0	0
Hookups	30	PICKUP,3/4 TON,4X4,CREWCAB	E	0	0	0	0	0	0	0	0	70	70	0	0
Hookups	30	CRANE,2.5 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	0	0	105	105	0	0
Hookups	30	WELDER,500-800 AMP DIESEL MULTI PURPOSE	E	0	0	0	0	0	0	0	0	105	105	0	0
Hookups	30	CRANE,55-60 TON,HYDRAULIC,RT	E	0	0	0	0	0	0	0	0	35	35	0	0
Hookups	30	ROAD TRACTOR,4X6	E	0	0	0	0	0	0	0	0	105	105	0	0
Hookups	30	FLATBED,1.5 TON,2X4,CREWCAB	E	0	0	0	0	0	0	0	0	105	105	0	0
Drilling	30	Generator Engine Run Time	E	0	0	0	0	0	0	0	0	714	714	0	0
Drilling	30	Mud Pump Engine Run Time	E	0	0	0	0	0	0	0	0	529	529	0	0
Drilling	30	F250 Pickup	E	0	0	0	0	0	0	0	0	394	394	0	0
Drilling	30	Cement Pump Truck	E	0	0	0	0	0	0	0	0	63	63	0	0
Drilling	30	Cement Bulk Truck	E	0	0	0	0	0	0	0	0	63	63	0	0
Drilling	30	Wireline Truck	E	0	0	0	0	0	0	0	0	63	63	0	0
Drilling	30	Vaccum Truck	E	0	0	0	0	0	0	0	0	252	252	0	0

**Operating Model Forecast for O&M Equipment Use
East Cat Canyon Brooks Thermal Development**

	vehicle type	vehicle count	comments Vehicles start in year 2023 unless otherwise noted	Horsepower (Rated)	(Max) Hours/year	Equipment Engine Type (estimate)	Miles/day	Miles/Yr
R&M Well servicing- rig in use on well	well servicing rig	1	note: add second rig in year 2025	238	4,368	Detroit Diesel	0	0
R&R- rig in use on well loaction	well servicing rig	1	scaled from R&M at ratio of 0.2	540	874	IDECO Rambler w/ Cat 3406	0	0
Pumping Unit Crew- crane operator	30T crane	1		350	416	F-650 w/ 441 cu in Cat diesel	20	5,200
CLAM Maintenance- crew	hydrocrane	1		350	1,040	F-650 w/ 441 cu in Cat diesel	20	5,200
FI Capital- crew	hydrocrane	1	note: start year 2025	350	1,040	F-650 w/ 441 cu in Cat diesel	20	5,200
FI Capital- crew	hydrocrane	1	note: start year 2025	350	1,040	F-650 w/ 441 cu in Cat diesel	20	5,200
Plant Maintenance- crew	hydrocrane	1		350	1,040	F-650 w/ 441 cu in Cat diesel	20	5,200
Vacuum Truck	diesel tractor/pump	1		450	1,664	Peterbilt Paccar MX	20	5,200
Tank cleaning- supersucker	diesel tractor/pump	1	average from only 4 weeks per year on-site	450	269	Peterbilt Paccar MX	10	280
Vacuum Truck	diesel tractor/pump	1		450	3,494	Peterbilt Paccar MX	20	7,280
R&R Vacuum Truck	diesel tractor/pump	1	scaled from R&M at ratio of 0.2	450	699	Peterbilt Paccar MX	20	1,456
Mud Pump	well servicing mud pump	1	note: add second mud pump for second rig in year 2025	250	4,368	250 HP Diesel	0	0
Mud pump	Mud Pump for rig	1	scaled from R&M at ratio of 0.2	250	874	250 HP Diesel	0	0
FI Capital- welding Engine	welding generator	2	note: start year 2025	22	1,248	Kubota V1505	0	0
CLAM Maintenance- welder generator	welding generator	1		22	1,248	Kubota V1505	20	5,200
Plant Maintenance- welder generator	welding generator	1		22	1,248	Kubota V1505	20	5,200
Pumping Unit Crew- support	gang truck	1		440	1,040	F-450 w/ 6.7L turbo diesel	20	5,200
Tank cleaning crew-	gang truck	1	average from only 4 weeks per year on-site	440	269	f-450 w/ 6.7L turbo diesel	10	280
Electrical Maintenance- crew	F450 4wd or equal	1		440	1,040	f-450 w/ 6.7L turbo diesel	40	10,400
Chemical Delivery	F450 4wd or equal	1	1 day per week	440	468	f-450 w/ 6.7L turbo diesel	80	4,160
FI Capital- E&I crew	F450 4wd or equal	1	note: start year 2025	440	2,080	f-450 w/ 6.7L turbo diesel	20	5,200
Well servicing- gang truck	gang truck	1	note: add second rig in year 2025	440	874	f-450 w/ 6.7L turbo diesel	20	7,280
R&R- gang truck	gang truck	1	scaled from R&M at ratio of 0.2	440	175	F-450 w/ 6.7L turbo diesel	20	1,456
Chemical- shot truck	F450 4wd or equal	1	1 day per week	440	468	F-450 w/ 6.7L turbo diesel	20	1,040
Maintenance Contractor Supervisor	F250 4wd or equal	1		385	1,040	Ford F-250	40	10,400
Plant Maintenance- welder truck				385	0	Ford F-250	20	5,200
Chemical support- technician	F250 4wd or equal	1		385	1,248	Ford F-250	60	15,600
FI Capital- supervisor	F250 4wd or equal	1	note: start year 2025	385	1,040	Ford F-250	20	5,200
Well servicing- tool pusher	F250 4wd or equal	1	note: add second rig in year 2025	385	2,184	Ford F-250	40	14,560
R&R- supervisor	F250 4wd or equal	1	scaled from R&M at ratio of 0.2	385	437	Ford F-250	40	2,912
CLAM Maintenance- welder truck				385	0	Ford F-250	20	5,200
FI Capital- welding truck			note: start year 2025		0	Ford F-250	20	5,200

Construction Equipment Horsepower Used

Equipment	HP	Equipment	HP
ASPHALT MILL ATTACHMENT,2-4'	81	GENERATOR,6-10KW,DIESEL	18
BACKHOE/LOADER,.75-1CY	67	GENERATOR,6-10KW,DIESEL	18
BACKHOE/LOADER,1.25-1.50CY	100	GOLF CART	50
BACKHOE/LOADER,1.50-2.0CY	100	HAMMER LEADS	205
BACKHOE/LOADER,1-1.25CY	92	HOLEPUNCH 7/16-13/16",HYDRAULIC	x
BACKHOE/LOADER,1-1.25CY	92	LOADER,SKIDSTEER 36-45HP	45
BOOMTRUCK,10-13 TON	226	LOADER,SKIDSTEER 36-45HP	45
BOOMTRUCK,23-28 TON	226	MANLIFT,40' RT,GAS OR DSL	60
BOOMTRUCK,23-28 TON	226	MANLIFT,40' RT,GAS OR DSL	60
BORING SYSTEM,30-36",AUGER,DIESEL	68	MANLIFT,40-50',ELECTRIC	x
BORING SYSTEM,30-36",AUGER,DIESEL	68	MANLIFT,60' RT,GAS OR DSL	60
BORING SYSTEM,PILOT TUBE,AUGER,HYDRAULIC	68	MECHANIC'S TRUCK,1 TON,2X4	130
BREAKER ATTACHMENT,4-5K#,HYDRAULIC	x	MECHANIC'S TRUCK,1.5 TON,2X4	130
Cat 14 Grader	259	MECHANIC'S TRUCK,2.5 TON,4X6	210
Cat 14 Grader	259	MORTAR MIXER,6-9 CU FT	7
Cat 623 Water Wagon	407	MOTOR GRADER,130-150 HP	150
Cat 623 Water Wagon	407	PEOPLE MOVER,16-30 PASS	305
Cat 815 Compactor	232	PICKUP,1/2 TON,2X4	130
Cat 815 Compactor	232	PICKUP,1/2 TON,2X4,CREWCAB	130
Cat 875 Challenger	585	PICKUP,1/2 TON,4X4	130
Cat 875 Challenger	585	PICKUP,3/4 TON,4X4,CREWCAB	180
Cat D6	207	PICKUP,3/4 TON,4X4,CREWCAB	180
Cat D6	207	POWER TROWEL,36"-48",GAS	20
COMPACTOR WHEEL ATTACHMENT,12-48"	x	REBAR BENDER,#2-#8 BAR ELEC	x
COMPACTOR,24-33" ROLLER,WALKBEHIND	8	REBAR BENDER,#2-#8 BAR ELEC	x
COMPACTOR,24-33" ROLLER,WALKBEHIND	8	ROAD TRACTOR,4X6	475
COMPACTOR,40-66" ROLLER,RIDE ON	33	SCISSOR LIFT,<20'	24
COMPACTOR,ROLLER,24-33"	14	SIDEBOOM,140K#,300HP (583)	300
COMPRESSOR,100-200 CFM,DIESEL	50	SIDEBOOM,90K#,200HP (572)	200
COMPRESSOR,100-200 CFM,DIESEL	50	SUV,6-9 PASSENGER 4X4	273
COMPRESSOR,300-400 CFM,DIESEL	110	SWEEPER,6-8',RIDING	45
COMPRESSOR,800-1000 CFM,DIESEL	275	TAMPER,100-150#	3
CONCRETE SAW,5-7" WET CUT	35	TRAILER,CABLE PULLER,20-30K PULL	x
CONCRETE VIBRATOR,HEAVY DUTY	6	TRAILER,POLE	x
CONCRETE VIBRATOR,HEAVY DUTY	6	TRENCHER,3-5'	80
CRANE,10-14 TON,HYDRAULIC,RT	62	TRENCHER,3-5'	80
CRANE,15-19 TON,HYDRAULIC,RT	110	TROWEL,36-48",WALK BEHIND	8
CRANE,40-50 TON,LAT BOOM, MECH,CRAWLER	150	TRUCK,1.5 TON,2X4,W/CRANE	210
CRANE,55-60 TON,HYDRAULIC,RT	240	TRUCK,2 TON,2X4,BUCKET	210
CRANE,70-79 TON,HYDRAULIC,RT	250	TRUCK,2 TON,2X4,DIGGER	210
DUMPTRUCK,10-12CY,4X6	214	TRUCK,3/4 TON,2X4,ELECT. MAINT	x
EXCAVATOR, 10-14K#,MINI	42	UTILITY TRUCK,1 TON Cable Tensioner	180
EXCAVATOR,50-60K#	176	UTILITY TRUCK,1 TON,4X4,CREWCAB	180
FLATBED,1 TON,2X4,CREWCAB	180	UTILITY TRUCK,3/4 TON,2X4	130
FLATBED,1.5 TON,2X4	210	WATER TRUCK,4-5K GALLON,4X6	175
FLATBED,20-28',4X6	300	WELDER,150-200 AMP, GASOLINE	11
FORKLIFT,6K# RT,TELE BOOM	73	WELDER,250-300 AMP DIESEL	18
FORKLIFT,7-9K#,YARD	73	WELDER,250-300 AMP INVERTER	18
FORKLIFT,7-9K#,YARD	73	WELDER,400-500 AMP DIESEL	48
FORKLIFT,8-9K# RT TELE BOOM	73	WELDER,500-800 AMP DIESEL MULTI PURPOSE	42
FUEL/LUBE TRUCK,2 TON,2X4	210	WHEEL LOADER,2.5-3.0CY	125
FUEL/LUBE TRUCK,4 TON,4X6	260	WHEEL LOADER,3.0-3.5CY	160
GENERATOR,5-7KW,GASOLINE	11	WHEEL LOADER,3.5-4.0CY	200

Construction Emissions

- Construction Equipment Emission
- Construction Vehicle Travel Emission
- Construction Fugitive Dust Emission
 - Construction Off-Site Emission

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Construction Equipment Emission Calculations

Unmitigated

On-Site

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
-3	1.88	9.49	23.72	0.02	0.95	0.88	0.00	0.66	2,178.70	2,192.61
-2	3.81	20.55	37.21	0.04	1.71	1.59	0.00	1.19	3,983.26	4,008.33
-1	5.42	31.73	49.19	0.06	2.39	2.23	0.00	1.55	5,283.88	5,316.49
1	0.75	4.24	8.11	0.01	0.34	0.32	0.00	0.28	882.23	888.04
2	0.66	4.03	7.05	0.01	0.30	0.28	0.00	0.26	832.01	837.47
3	0.28	1.60	3.09	0.01	0.12	0.11	0.00	0.14	444.56	447.58
4	1.11	8.38	9.41	0.02	0.42	0.39	0.00	0.45	1,525.85	1,535.22
5	3.41	24.77	31.54	0.06	1.31	1.22	0.00	1.66	5,425.95	5,460.75
6	0.01	0.06	0.10	0.00	0.00	0.00	0.00	0.01	16.43	16.54
7	0.26	2.04	2.36	0.01	0.10	0.09	0.00	0.14	453.43	456.36
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.22	1.48	2.13	0.00	0.09	0.08	0.00	0.14	436.18	439.14
10	0.11	0.78	1.01	0.00	0.04	0.04	0.00	0.05	169.54	170.60
11	0.27	2.13	1.07	0.01	0.03	0.03	0.00	0.02	592.29	592.73
12	0.36	2.55	1.42	0.01	0.05	0.05	0.00	0.03	788.24	788.84
13	0.11	0.97	0.45	0.00	0.01	0.01	0.00	0.01	226.96	227.13
14	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	9.68	9.69
15	0.23	1.49	0.93	0.01	0.03	0.03	0.00	0.02	496.44	496.83
16	0.71	5.78	2.22	0.02	0.07	0.07	0.00	0.06	1,756.87	1,758.05
17	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	9.68	9.69
18	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	9.68	9.69

1. Emissions calculated using the CalEEMod v2013.2.2 Program
2. Equipment size and use based on Applicant submittal
3. Days per month based on 6 working days per week.
4. Hours per day based on 10 working hours per day.
5. Truck emissions are included in the offsite calculations because they are certified for on-road use.

Unmitigated

14-Mile Fuel Line

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
-2	3.45	24.04	36.55	0.04	1.81	1.68	0.00	1.11	3,866.13	3,899.43

Unmitigated

115KV Interconnect & Substation

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
-3	0.13	0.72	1.09	0.001	0.06	0.06	0.00	0.03	95.04	95.59

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Construction Equipment Emission Calculations

Mitigated - Tier 4 Engines

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
-3	0.29	11.44	1.23	0.02	0.04	0.04	0.00	0.66	2,178.70	2,192.61
-2	0.60	22.61	5.60	0.04	0.07	0.07	0.00	1.19	3,983.26	4,008.32
-1	0.83	33.80	8.92	0.06	0.09	0.09	0.00	1.55	5,283.87	5,316.48
1	0.13	5.30	0.81	0.01	0.02	0.02	0.00	0.28	882.23	888.04
2	0.12	5.11	0.80	0.01	0.02	0.02	0.00	0.26	832.01	837.47
3	0.06	2.42	0.27	0.01	0.01	0.01	0.00	0.14	444.56	447.57
4	0.24	9.59	2.55	0.02	0.03	0.03	0.00	0.45	1,525.85	1,535.22
5	0.81	32.48	6.33	0.06	0.10	0.10	0.00	1.66	5,425.94	5,460.74
6	0.00	0.08	0.01	0.00	0.00	0.00	0.00	0.01	16.43	16.54
7	0.07	2.79	0.45	0.01	0.01	0.01	0.00	0.14	453.43	456.36
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.06	2.38	0.26	0.00	0.01	0.01	0.00	0.14	436.18	439.14
10	0.03	1.02	0.20	0.00	0.00	0.00	0.00	0.05	169.54	170.60
11	0.07	3.08	0.51	0.01	0.01	0.01	0.00	0.02	592.28	592.73
12	0.10	3.91	0.59	0.01	0.01	0.01	0.00	0.03	788.24	788.84
13	0.03	1.28	0.25	0.00	0.00	0.00	0.00	0.01	226.96	227.13
14	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	9.68	9.69
15	0.06	2.37	0.37	0.01	0.01	0.01	0.00	0.02	496.44	496.82
16	0.21	8.83	1.32	0.02	0.03	0.03	0.00	0.06	1,756.86	1,758.05
17	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	9.68	9.69
18	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	9.68	9.69

1. Emissions calculated using the CalEEMod v2013.2.2 Program
2. Equipment size and use based on Applicant submittal
3. Days per month based on 6 working days per week.
4. Hours per day based on 10 working hours per day.
5. Truck emissions are included in the offsite calculations because they are certified for on-road use.
6. Tier 4 construction equipment was used to mitigate the construction emissions.

Mitigated - Tier 4 Engines

14-Mile Fuel Line

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
-2	0.52	24.49	2.78	0.04	0.07	0.07	0.00	1.11	3,866.12	3,889.43

Mitigated - Tier 4 Engines

115KV Interconnect & Substation

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
-3	0.014	0.619	0.171	0.0011	0.0015	0.0015	0.00	0.03	95.04	92.59

AERA - Santa Barbara County - Cat Canyon - ECC Project

Construction Vehicle Travel Emission Calculations

Unmitigated

On-site Construction Activities

Year	Activity/Source	Vehicle	EMFAC Vehicle Type	Fuel-Speed	From	Annual R.T.	Miles per R.T.	Emission Factor (g/mile)										Emissions (tons/year)						Emissions (MT/year)			
								ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e	
-3	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	211	32.4	0.151193	0.637357	6.741905	0.00	0.100488	0.096411	0.0048	0.0051	1528.636	0.0011	0.0048	0.0508	0.0000	0.0008	0.0007	0.0000	0.0000	0.0000	10.45	10.46
-3	Employees	Auto	LDA	G-55	SM	4,745	32.4	0.020694	0.860683	0.104406	0.00	0.001357	0.001249	0.0647	0.0704	261.8851	0.0035	0.1459	0.0177	0.0000	0.0002	0.0002	0.0009	0.0108	40.26	43.57	
-2	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	1,037	32.4	0.091222	0.373399	5.602221	0.00	0.049222	0.047093	0.0048	0.0051	1511.422	0.0034	0.0138	0.2075	0.0000	0.0018	0.0017	0.0002	0.0002	50.78	50.84	
-2	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	45	276	0.091222	0.373399	5.602221	0.00	0.049222	0.047093	0.0048	0.0051	1511.422	0.0012	0.0051	0.0767	0.0000	0.0007	0.0006	0.0001	0.0001	18.77	18.79	
-2	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	OS	6	808	0.091222	0.373399	5.602221	0.00	0.049222	0.047093	0.0048	0.0051	1511.422	0.0005	0.0020	0.0299	0.0000	0.0003	0.0003	0.0000	0.0000	7.33	7.34	
-2	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	123	154.2	0.091222	0.373399	5.602221	0.00	0.049222	0.047093	0.0048	0.0051	1511.422	0.0019	0.0078	0.1171	0.0000	0.0010	0.0010	0.0001	0.0001	28.67	28.70	
-2	Employees	Auto	LDA	G-55	SM	41,989	32.4	0.016715	0.751187	0.090739	0.00	0.001341	0.001234	0.0647	0.0704	254.8155	0.0251	1.1265	0.1361	0.0000	0.0020	0.0019	0.0080	0.0958	346.66	375.96	
-1	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	445	32.4	0.082782	0.342965	5.067052	0.00	0.04262	0.040776	0.0048	0.0051	1497.538	0.0013	0.0055	0.0805	0.0000	0.0007	0.0006	0.0001	0.0001	21.59	21.61	
-1	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	106	276	0.082782	0.342965	5.067052	0.00	0.04262	0.040776	0.0048	0.0051	1497.538	0.0027	0.0111	0.1634	0.0000	0.0014	0.0013	0.0001	0.0001	43.81	43.86	
-1	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	OS	6	808	0.082782	0.342965	5.067052	0.00	0.04262	0.040776	0.0048	0.0051	1497.538	0.0004	0.0018	0.0271	0.0000	0.0002	0.0002	0.0000	0.0000	7.26	7.27	
-1	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	180	154.2	0.082782	0.342965	5.067052	0.00	0.04262	0.040776	0.0048	0.0051	1497.538	0.0025	0.0105	0.1550	0.0000	0.0013	0.0012	0.0001	0.0001	41.57	41.61	
-1	Employees	Auto	LDA	G-55	SM	70,561	32.4	0.019293	0.199246	0.175843	0.00	0.013227	0.012655	0.0647	0.0704	251.7188	0.0486	0.5021	0.4431	0.0000	0.0333	0.0319	0.1479	1.609	575.47	624.71	
1	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	8	154.2	0.062672	0.267293	4.268094	0.00	0.028011	0.026799	0.0048	0.0051	1483.078	0.0001	0.0004	0.0058	0.0000	0.0000	0.0000	0.0000	0.0000	1.83	1.83	
1	Employees	Auto	LDA	G-55	SM	5,054	32.4	0.012154	0.607815	0.071279	0.00	0.001335	0.001228	0.0647	0.0704	240.612	0.0022	0.1097	0.0129	0.0000	0.0002	0.0002	0.0106	0.0115	39.40	42.93	
2	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	8	154.2	0.057764	0.25314	3.677975	0.00	0.024166	0.02312	0.0048	0.0051	1467.587	0.0001	0.0003	0.0050	0.0000	0.0000	0.0000	0.0000	0.0000	1.81	1.81	
2	Employees	Auto	LDA	G-55	SM	4,828	32.4	0.010841	0.562104	0.064352	0.00	0.001318	0.001212	0.0647	0.0704	233.5884	0.0019	0.0969	0.0111	0.0000	0.0002	0.0002	0.0101	0.0110	36.54	39.91	
3	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	5	154.2	0.052711	0.235751	3.090283	0.00	0.019384	0.018546	0.0048	0.0051	1449.996	0.0000	0.0002	0.0026	0.0000	0.0000	0.0000	0.0000	0.0000	1.12	1.12	
3	Employees	Auto	LDA	G-55	SM	1,732	32.4	0.009749	0.52468	0.058567	0.00	0.001305	0.0012	0.0647	0.0704	226.7004	0.0006	0.0325	0.0036	0.0000	0.0001	0.0001	0.0036	0.0040	12.72	13.93	
4	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	373	32.4	0.031069	0.182112	0.848479	0.00	0.005697	0.005451	0.0048	0.0051	1406.097	0.0004	0.0024	0.0113	0.0000	0.0001	0.0001	0.0001	0.0001	16.99	17.01	
4	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	37	276	0.031069	0.182112	0.848479	0.00	0.005697	0.005451	0.0048	0.0051	1406.097	0.0003	0.0021	0.0096	0.0000	0.0001	0.0001	0.0000	0.0001	14.36	14.38	
4	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	OS	7	808	0.031069	0.182112	0.848479	0.00	0.005697	0.005451	0.0048	0.0051	1406.097	0.0002	0.0011	0.0053	0.0000	0.0000	0.0000	0.0000	0.0000	7.95	7.96	
4	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	53	154.2	0.031069	0.182112	0.848479	0.00	0.005697	0.005451	0.0048	0.0051	1406.097	0.0003	0.0016	0.0076	0.0000	0.0001	0.0000	0.0000	0.0000	11.49	11.50	
4	Employees	Auto	LDA	G-55	SM	25,090	32.4	0.008792	0.491256	0.053621	0.00	0.001296	0.001192	0.0647	0.0704	219.9673	0.0079	0.4402	0.0480	0.0000	0.0012	0.0011	0.0526	0.0572	178.82	196.32	
5	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	403	32.4	0.031163	0.182958	0.80919	0.00	0.005637	0.005393	0.0048	0.0051	1399.408	0.0004	0.0026	0.0116	0.0000	0.0001	0.0001	0.0001	0.0001	18.27	18.29	
5	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	93	276	0.031163	0.182958	0.80919	0.00	0.005637	0.005393	0.0048	0.0051	1399.408	0.0009	0.0052	0.0229	0.0000	0.0002	0.0002	0.0001	0.0001	35.92	35.96	
5	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	OS	7	808	0.031163	0.182958	0.80919	0.00	0.005637	0.005393	0.0048	0.0051	1399.408	0.0002	0.0011	0.0050	0.0000	0.0000	0.0000	0.0000	0.0000	7.92	7.92	
5	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	73	154.2	0.031163	0.182958	0.80919	0.00	0.005637	0.005393	0.0048	0.0051	1399.408	0.0004	0.0023	0.0100	0.0000	0.0001	0.0001	0.0001	0.0001	15.75	15.77	
5	Employees	Auto	LDA	G-55	SM	35,554	32.4	0.007953	0.460768	0.049335	0.00	0.001291	0.001187	0.0647	0.0704	213.3629	0.0101	0.5851	0.0626	0.0000	0.0016	0.0015	0.0745	0.0811	245.78	270.59	
6	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	2	154.2	0.031098	0.182794	0.765484	0.00	0.005564	0.005323	0.0048	0.0051	1392.862	0.0000	0.0001	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.43	0.43	
6	Employees	Auto	LDA	G-55	SM	312	32.4	0.003977	0.434941	0.045875	0.00	0.001292	0.001188	0.0647	0.0704	206.8211	0.0001	0.0048	0.0005	0.0000	0.0000	0.0000	0.0007	0.0007	2.09	2.31	
7	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	1	154.2	0.030977	0.182252	0.723789	0.00	0.005494	0.005256	0.0048	0.0051	1386.476	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.21	0.21	
7	Employees	Auto	LDA	G-55	SM	1,632	32.4	0.006762	0.413027	0.042909	0.00	0.001273	0.00117	0.0647	0.0704	200.9665	0.0004	0.0241	0.0025	0.0000	0.0001	0.0001	0.0034	0.0037	10.63	11.77	
9	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	2	154.2	0.030512	0.179741	0.63938	0.00	0.005336	0.005105	0.0048	0.0051	1373.305	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.42	0.42	
9	Employees	Auto	LDA	G-55	SM	1,563	32.4	0.0058	0.374918	0.037794	0.00	0.001154	0.001061	0.0647	0.0704	191.0012	0.0003	0.0209	0.0021	0.0000	0.0001	0.0001	0.0033	0.0036	9.67	10.76	
10	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	2	154.2	0.030298	0.178563	0.602128	0.00	0.005271	0.005043	0.0048	0.0051	1367.262	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.42	0.42	
10	Employees	Auto	LDA	G-55	SM	886	32.4	0.005374	0.357737	0.035538	0.00	0.001084	0.000997	0.0647	0.0704	186.8172	0.0002	0.0113	0.0011	0.0000	0.0000	0.0000	0.0019	0.0020	5.36	5.98	
11	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	2	154.2	0.030099	0.177459	0.568774	0.00	0.005213	0.004987	0.0048	0.0051	1361.643	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.42	0.42	
11	Employees	Auto	LDA	G-55	SM	2,614	32.4	0.005005	0.342518	0.033517	0.00	0.00102	0.000938	0.0647	0.0704	183.1037	0.0005	0.0320	0.0031	0.0000	0.0001	0.0001	0.0055	0.0060	15.51	17.33	

Construction Fugitive Dust Emission Calculations
Unmitigated

Cut/Fill ¹		Fill (cubic yards)	Cut (cubic yards)	Emissions Factor	Tons/Year	
Year	Activity/Source				PM10	PM2.5
-3	Cut/Fill	266,903	521,238	CalEEMod	0.070	0.011
-2	Cut/Fill	310,882	435,779	CalEEMod	0.066	0.010
-1	Cut/Fill	768,987	284,010	CalEEMod	0.093	0.014
1	Cut/Fill	35,804	121,268	CalEEMod	0.014	0.002
5	Cut/Fill	975,163	1,444,936	CalEEMod	0.214	0.033
7	Cut/Fill	13,724	6,276	CalEEMod	0.002	0.0003
10	Cut/Fill	0	42,099	CalEEMod	0.004	0.001
11	Cut/Fill	13,573	25,199	CalEEMod	0.003	0.001
12	Cut/Fill	207,038	78,439	CalEEMod	0.025	0.004
15	Cut/Fill	17,828	11,997	CalEEMod	0.003	0.000
16	Cut/Fill	501,266	177,032	CalEEMod	0.060	0.009
Site Grading ¹		Area Disturbed		Emissions Factor	Tons/Year	
Year	Activity/Source				PM10	PM2.5
-3	Site Grading	50.53	acres/year	CalEEMod	0.027	0.003
-2	Site Grading	42.41	acres/year	CalEEMod	0.023	0.002
-1	Site Grading	59.80	acres/year	CalEEMod	0.032	0.003
1	Site Grading	10.59	acres/year	CalEEMod	0.006	0.0006
5	Site Grading	81.06	acres/year	CalEEMod	0.043	0.005
7	Site Grading	2.50	acres/year	CalEEMod	0.001	0.0001
10	Site Grading	3.00	acres/year	CalEEMod	0.002	0.0002
11	Site Grading	3.52	acres/year	CalEEMod	0.002	0.0002
12	Site Grading	11.88	acres/year	CalEEMod	0.006	0.0002
15	Site Grading	4.72	acres/year	CalEEMod	0.002	0.0003
16	Site Grading	36.04	acres/year	CalEEMod	0.019	0.0021
Unpaved Travel On-site Construction Activities ¹		VMT		Emissions Factor	Tons/Year	
Year	Activity/Source				PM10	PM2.5
-3	Autos	2,847.0	miles/year	CalEEMod	1.381	0.189
-3	Trucks	126.6	miles/year	CalEEMod	0.084	0.008
-2	Autos	25,193.4	miles/year	CalEEMod	16.662	1.663
-2	Trucks	726.6	miles/year	CalEEMod	0.481	0.048
-1	Autos	42,336.6	miles/year	CalEEMod	28.000	2.795
-1	Trucks	442.2	miles/year	CalEEMod	0.293	0.029
1	Autos	3,032.4	miles/year	CalEEMod	2.066	0.200
1	Trucks	4.8	miles/year	CalEEMod	0.003	0.000
2	Autos	2,896.8	miles/year	CalEEMod	1.916	0.191
2	Trucks	4.8	miles/year	CalEEMod	0.003	0.000
3	Autos	1,039.2	miles/year	CalEEMod	0.687	0.069
3	Trucks	3.0	miles/year	CalEEMod	0.002	0.000
4	Autos	15,054.0	miles/year	CalEEMod	9.956	0.994
4	Trucks	282.0	miles/year	CalEEMod	0.187	0.019
5	Autos	21,332.4	miles/year	CalEEMod	14.108	1.408
5	Trucks	345.6	miles/year	CalEEMod	0.229	0.023
6	Autos	187.2	miles/year	CalEEMod	0.124	0.012
6	Trucks	1.2	miles/year	CalEEMod	0.001	0.000
7	Autos	979.2	miles/year	CalEEMod	0.648	0.065
7	Trucks	0.6	miles/year	CalEEMod	0.000	0.000
9	Autos	937.8	miles/year	CalEEMod	0.620	0.062
9	Trucks	1.2	miles/year	CalEEMod	0.001	0.000
10	Autos	531.6	miles/year	CalEEMod	0.352	0.035
10	Trucks	1.2	miles/year	CalEEMod	0.001	0.000
11	Autos	1,568.4	miles/year	CalEEMod	1.037	0.104
11	Trucks	1.2	miles/year	CalEEMod	0.001	0.000
12	Autos	1,780.2	miles/year	CalEEMod	1.177	0.118
12	Trucks	1.2	miles/year	CalEEMod	0.001	0.000
13	Autos	480.6	miles/year	CalEEMod	0.318	0.032
13	Trucks	0.6	miles/year	CalEEMod	0.000	0.000
14	Autos	93.6	miles/year	CalEEMod	0.062	0.006
15	Autos	601.2	miles/year	CalEEMod	0.398	0.040
16	Autos	4,507.8	miles/year	CalEEMod	2.981	0.298
16	Trucks	3.0	miles/year	CalEEMod	0.002	0.000
17	Autos	93.6	miles/year	CalEEMod	0.062	0.006
18	Autos	93.6	miles/year	CalEEMod	0.062	0.006
Unpaved Travel 14-Mile Fuel Line Construction Activities ¹		VMT		Emissions Factor	Tons/Year	
Year	Activity/Source				PM10	PM2.5
-2	Autos	9,034.8	miles/year	CalEEMod	5.975	0.596
-2	Trucks	40.2	miles/year	CalEEMod	0.027	0.003
Unpaved Travel 115KV Interconnect and Substation Construction Activities ¹		VMT		Emissions Factor	Tons/Year	
Year	Activity/Source				PM10	PM2.5
-3	Autos	733.2	miles/year	CalEEMod	0.485	0.048

1. Grading Emissions were calculated using CalEEMod which used the following methodology.

$$EF_{PM_{10}} = 0.051 \times (S^2)^{-1}, \text{ and } EF_{PM_{2.5}} = EF_{PM_{10}} \times F_{PM_{2.5}}$$

$$EF_{TP} = 0.04 \times (S^2)^{-1}, \text{ and } EF_{PM_{2.5}} = EF_{TP} \times F_{PM_{2.5}}$$

Where,

EF = emissions factor (lb/VMT)

S = mean vehicle speed (mph). AP-42 default is 7.1 mph.

F_{PM2.5} = PM_{2.5} scaling factor. AP-42 default is 0.031.

F_{PM10} = PM₁₀ scaling factor. AP-42 default is 0.6.

Then,

$$E = EF \times VMT$$

$$VMT = As / Wb \times 43,560 \text{ (sqft/acre)} / 5,280 \text{ (ft/mile)}$$

Where,

E = emissions (lb)

EF = emissions factor (lb/VMT)

VMT = vehicle miles travels (mile)

As = acreage of the grading site (acre)

Wb = Blade width of the grading equipment. Default blade width of 12 ft.

2. Cut and Fill emissions were calculated using CalEEMod which used the following methodology.

$$EF = k \times (0.0032) \times [(U/S)^{-1} / (M/2)^{-1}]$$

Where,

EF = emissions factor (lb/ton)

k = particle size multiplier. AP-42 default is PM₁₀ = 0.35 and PM_{2.5} = 0.053

U = mean wind speed (mph). Based on location parameters.

M = material moisture content (%). Default = 12%

Then,

$$E = EF \times TP$$

Where,

E = emissions (lb)

EF = emissions factor (lb/ton)

TP = throughput of loaded and unloaded materials (ton). Assumes 1.2641662 tons per CY.

3. Unpaved road traveled emissions were calculated using CalEEMod which used the following methodology.

$$EF = [(k \times (s/12)^2 \times (S/30)^{-1}) / (M/0.5)^{-1}] \times C \times (1 - (P/365))$$

Where,

EF = emission factor

k = particle size multiplier

s = surface material silt content (%)

M = surface material moisture content (%)

S = mean vehicle speed (mph)

C = emissions factor for 1980's vehicle fleet exhaust, brake wear and tire wear

P = number of days in a year with at least 0.254 mm of precipitation

Then,

$$E = EF \times VMT$$

Where,

E = emissions

EF = emission factor

VMT = unpaved vehicle miles traveled

Construction Fugitive Dust Emission Calculations
Mitigated

Cut/Fill ^{1,4}		Fill (cubic yards)	Cut (cubic yards)	Emissions Factor	Tons/Year	
Year	Activity/Source				PM10	PM2.5
-3	Cut/Fill	266,903	521,238	CalEEMod	0.027	0.004
-2	Cut/Fill	310,882	435,779	CalEEMod	0.026	0.004
-1	Cut/Fill	768,987	284,010	CalEEMod	0.036	0.005
1	Cut/Fill	35,804	121,268	CalEEMod	0.005	0.001
5	Cut/Fill	975,163	1,444,936	CalEEMod	0.084	0.013
7	Cut/Fill	13,724	6,276	CalEEMod	0.001	0.0001
10	Cut/Fill	0	42,099	CalEEMod	0.001	0.0002
11	Cut/Fill	13,573	25,199	CalEEMod	0.001	0.0002
12	Cut/Fill	207,038	78,439	CalEEMod	0.010	0.001
15	Cut/Fill	17,828	11,997	CalEEMod	0.001	0.0002
16	Cut/Fill	501,266	177,032	CalEEMod	0.023	0.004
Site Grading ^{1,4}		Area Disturbed		Emissions Factor	Tons/Year	
Year	Activity/Source				PM10	PM2.5
-3	Site Grading	50.53	acres/year	CalEEMod	0.010	0.001
-2	Site Grading	42.41	acres/year	CalEEMod	0.009	0.001
-1	Site Grading	59.80	acres/year	CalEEMod	0.012	0.0013
1	Site Grading	10.59	acres/year	CalEEMod	0.002	0.0002
5	Site Grading	81.06	acres/year	CalEEMod	0.017	0.002
7	Site Grading	2.50	acres/year	CalEEMod	0.0005	0.0001
10	Site Grading	3.00	acres/year	CalEEMod	0.001	0.0001
11	Site Grading	3.52	acres/year	CalEEMod	0.0007	0.0001
12	Site Grading	11.88	acres/year	CalEEMod	0.002	0.0002
15	Site Grading	4.72	acres/year	CalEEMod	0.0010	0.0001
16	Site Grading	36.04	acres/year	CalEEMod	0.007	0.0008
Unpaved Travel On-site Construction Activities ^{1,4,5}		VMT		Emissions Factor	Tons/Year	
Year	Activity/Source				PM10	PM2.5
-3	Unpaved Roads Autos	2,847.0	miles/year	CalEEMod	0.450	0.045
-3	Unpaved Roads Trucks	126.6	miles/year	CalEEMod	0.020	0.002
-2	Unpaved Roads Autos	25,193.4	miles/year	CalEEMod	3.979	0.397
-2	Unpaved Roads Trucks	726.6	miles/year	CalEEMod	0.115	0.011
-1	Unpaved Roads Autos	42,336.6	miles/year	CalEEMod	6.686	0.667
-1	Unpaved Roads Trucks	442.2	miles/year	CalEEMod	0.070	0.007
1	Unpaved Roads Autos	3,032.4	miles/year	CalEEMod	0.479	0.048
1	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.001	0.000
2	Unpaved Roads Autos	2,896.8	miles/year	CalEEMod	0.458	0.046
2	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.001	0.000
3	Unpaved Roads Autos	1,039.2	miles/year	CalEEMod	0.164	0.016
3	Unpaved Roads Trucks	3.0	miles/year	CalEEMod	0.000	0.000
4	Unpaved Roads Autos	15,054.0	miles/year	CalEEMod	2.378	0.237
4	Unpaved Roads Trucks	282.0	miles/year	CalEEMod	0.045	0.004
5	Unpaved Roads Autos	21,332.4	miles/year	CalEEMod	3.369	0.336
5	Unpaved Roads Trucks	345.6	miles/year	CalEEMod	0.140	0.005
6	Unpaved Roads Autos	187.2	miles/year	CalEEMod	0.030	0.003
6	Unpaved Roads Trucks	1.2	miles/year	CalEEMod	0.000	0.000
7	Unpaved Roads Autos	979.2	miles/year	CalEEMod	0.155	0.015
7	Unpaved Roads Trucks	0.6	miles/year	CalEEMod	0.000	0.000
9	Unpaved Roads Autos	937.8	miles/year	CalEEMod	0.148	0.015
9	Unpaved Roads Trucks	1.2	miles/year	CalEEMod	0.000	0.000
10	Unpaved Roads Autos	531.6	miles/year	CalEEMod	0.084	0.008
10	Unpaved Roads Trucks	1.2	miles/year	CalEEMod	0.000	0.000
11	Unpaved Roads Autos	1,568.4	miles/year	CalEEMod	0.248	0.025
11	Unpaved Roads Trucks	1.2	miles/year	CalEEMod	0.000	0.000
12	Unpaved Roads Autos	1,780.2	miles/year	CalEEMod	0.281	0.028
12	Unpaved Roads Trucks	1.2	miles/year	CalEEMod	0.000	0.000
13	Unpaved Roads Autos	480.6	miles/year	CalEEMod	0.076	0.008
13	Unpaved Roads Trucks	0.6	miles/year	CalEEMod	0.000	0.000
14	Unpaved Roads Autos	93.6	miles/year	CalEEMod	0.015	0.001
15	Unpaved Roads Autos	601.2	miles/year	CalEEMod	0.095	0.009
16	Unpaved Roads Autos	4,507.8	miles/year	CalEEMod	0.712	0.071
16	Unpaved Roads Trucks	3.0	miles/year	CalEEMod	0.000	0.000
17	Unpaved Roads Autos	93.6	miles/year	CalEEMod	0.015	0.001
18	Unpaved Roads Autos	93.6	miles/year	CalEEMod	0.015	0.001
Unpaved Travel 14-Mile Fuel Line Construction Activities ^{1,4,5}		VMT		Emissions Factor	Tons/Year	
Year	Activity/Source				PM10	PM2.5
-2	Unpaved Roads Autos	9,034.8	miles/year	CalEEMod	1.427	0.142
-2	Unpaved Roads Trucks	40.2	miles/year	CalEEMod	0.006	0.001
Unpaved Travel 115KV Interconnect and Substation Construction Activities ^{1,4,5}		VMT		Emissions Factor	Tons/Year	
Year	Activity/Source				PM10	PM2.5
-3	Unpaved Roads Autos	733.2	miles/year	CalEEMod	0.116	0.012

1. Grading Emissions were calculated using CalEEMod which used the following methodology.

$$EF_{PM_{10}} = 0.051 \times (S^2)^{-1}, \text{ and } EF_{PM_{2.5}} = EF_{PM_{10}} \times F_{PM_{2.5}}$$

$$EF_{TP} = 0.04 \times (S^2)^{-1}, \text{ and } EF_{PM_{2.5}} = EF_{TP} \times F_{PM_{2.5}}$$

Where,

AERA - Santa Barbara County - Cat Canyon - ECC Project

Construction Off-Site Emission Calculations
Unmitigated

Year	Activity/Source	Vehicle	Fuel-Speed	From	Annual R.T.	Miles per R.T.	Emission Factor (g/mile)										Emissions (tons/year)					Emissions (MT/year)					
							ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e		
-2	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	16	32.4	0.082782	0.342965	5.067052	0.00	0.04262	0.040776	0.0048	0.0051	1497.538	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.07	2.07
-2	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	5	276	0.082782	0.342965	5.067052	0.00	0.04262	0.040776	0.0048	0.0051	1497.538	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.07	2.07
-2	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	40	154.2	0.082782	0.342965	5.067052	0.00	0.04262	0.040776	0.0048	0.0051	1497.538	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	9.24	9.24
-2	Employees	Auto	LDA	G-55	SM	2,444	32.4	0.019293	0.199246	0.175843	0.00	0.013227	0.012655	0.0647	0.0704	251.7188	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.01	19.93	21.64
-1	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	270	32.4	0.062672	0.267293	4.268094	0.00	0.028011	0.026799	0.0048	0.0051	1483.078	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	12.97	12.99
-1	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	72	276	0.062672	0.267293	4.268094	0.00	0.028011	0.026799	0.0048	0.0051	1483.078	0.00	0.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	29.47	29.50
-1	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	690	154.2	0.062672	0.267293	4.268094	0.00	0.028011	0.026799	0.0048	0.0051	1483.078	0.00	0.00	0.01	0.50	0.00	0.00	0.00	0.00	0.00	157.80	157.97
-1	Employees	Auto	LDA	G-55	SM	14,711	32.4	0.012154	0.607815	0.071279	0.00	0.001335	0.001228	0.0647	0.0704	240.612	0.01	0.32	0.04	0.00	0.00	0.00	0.00	0.03	0.03	114.68	124.95
2	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	6	32.4	0.057764	0.25314	3.677975	0.00	0.024166	0.02312	0.0048	0.0051	1467.587	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.41
2	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	1	276	0.057764	0.25314	3.677975	0.00	0.024166	0.02312	0.0048	0.0051	1467.587	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.41
2	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	16	154.2	0.057764	0.25314	3.677975	0.00	0.024166	0.02312	0.0048	0.0051	1467.587	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.62	3.62
2	Employees	Auto	LDA	G-55	SM	1,222	32.4	0.010841	0.562104	0.064352	0.00	0.001318	0.001212	0.0647	0.0704	233.5884	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.25	10.10
3	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	6	32.4	0.052711	0.235751	3.090283	0.00	0.019384	0.018546	0.0048	0.0051	1449.996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.28
3	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	1	276	0.052711	0.235751	3.090283	0.00	0.019384	0.018546	0.0048	0.0051	1449.996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.40
3	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	16	154.2	0.052711	0.235751	3.090283	0.00	0.019384	0.018546	0.0048	0.0051	1449.996	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	3.58
3	Employees	Auto	LDA	G-55	SM	1,222	32.4	0.009749	0.52468	0.058567	0.00	0.001305	0.0012	0.0647	0.0704	226.7004	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.98	9.83
4	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	6	32.4	0.031069	0.182112	0.848479	0.00	0.005697	0.005451	0.0048	0.0051	1406.097	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27
4	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	1	276	0.031069	0.182112	0.848479	0.00	0.005697	0.005451	0.0048	0.0051	1406.097	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.39
4	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	16	154.2	0.031069	0.182112	0.848479	0.00	0.005697	0.005451	0.0048	0.0051	1406.097	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.47	3.47
4	Employees	Auto	LDA	G-55	SM	1,222	32.4	0.008792	0.491256	0.053621	0.00	0.001296	0.001192	0.0647	0.0704	219.9673	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.71	9.56
5	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	281	32.4	0.031163	0.182958	0.80919	0.00	0.005637	0.005393	0.0048	0.0051	1399.408	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	12.74	12.76
5	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	74	276	0.031163	0.182958	0.80919	0.00	0.005637	0.005393	0.0048	0.0051	1399.408	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	28.58	28.61
5	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	717	154.2	0.031163	0.182958	0.80919	0.00	0.005637	0.005393	0.0048	0.0051	1399.408	0.00	0.02	0.10	0.00	0.00	0.00	0.00	0.00	0.00	154.72	154.90
5	Employees	Auto	LDA	G-55	SM	14,758	32.4	0.007953	0.460768	0.049335	0.00	0.001291	0.001187	0.0647	0.0704	213.3629	0.00	0.24	0.03	0.00	0.00	0.00	0.03	0.03	102.02	112.32	
6	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	12	32.4	0.031098	0.182794	0.765484	0.00	0.005564	0.005323	0.0048	0.0051	1392.862	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.54
6	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	4	276	0.031098	0.182794	0.765484	0.00	0.005564	0.005323	0.0048	0.0051	1392.862	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.54	1.54
6	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	32	154.2	0.031098	0.182794	0.765484	0.00	0.005564	0.005323	0.0048	0.0051	1392.862	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.87	6.88
6	Employees	Auto	LDA	G-55	SM	2,491	32.4	0.00731	0.434941	0.045875	0.00	0.001292	0.001188	0.0647	0.0704	206.8211	0.00	0.04	0.00	0.00	0.00	0.00	0.01	0.01	16.69	18.43	
7	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	47	32.4	0.030977	0.182252	0.723789	0.00	0.005494	0.005256	0.0048	0.0051	1386.476	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.11	2.11
7	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	13	276	0.030977	0.182252	0.723789	0.00	0.005494	0.005256	0.0048	0.0051	1386.476	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.97	4.98
7	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	120	154.2	0.030977	0.182252	0.723789	0.00	0.005494	0.005256	0.0048	0.0051	1386.476	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	25.66	25.68
7	Employees	Auto	LDA	G-55	SM	6,204	32.4	0.006762	0.413027	0.042909	0.00	0.001273	0.00117	0.0647	0.0704	200.9665	0.00	0.09	0.01	0.00	0.00	0.00	0.01	0.01	40.40	44.73	
8	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	19	32.4	0.030751	0.181048	0.681196	0.00	0.005412	0.005178	0.0048	0.0051	1379.957	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.85
8	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	5	276	0.030751	0.181048	0.681196	0.00	0.005412	0.005178	0.0048	0.0051	1379.957	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.90	1.91
8	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	47	154.2	0.030751	0.181048	0.681196	0.00	0.005412	0.005178	0.0048	0.0051	1379.957	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	10.00	10.01
8	Employees	Auto	LDA	G-55	SM	2,444	32.4	0.006257	0.393078	0.040221	0.00	0.001226	0.001127	0.0647	0.0704	195.6982	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.01	0.00	15.50	17.20
9	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	16	32.4	0.030512	0.179741	0.63938	0.00	0.005336	0.005105	0.0048	0.0051	1373.305	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71	0.71
9	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	5	276	0.030512	0.179741	0.63938	0.00	0.005336	0.005105	0.0048	0.0051	1373.305	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.90	1.90
9	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	40	154.2	0.030512	0.179741	0.63938	0.00	0.005336	0.005105	0.0048	0.0051	1373.305	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.47	8.48
9	Employees	Auto	LDA	G-55	SM	2,444	32.4	0.0058	0.374918	0.037794	0.00	0.001154	0.001061	0.0647	0.0704	191.0012	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.01	15.12	16.83	
10	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	SM	43	32.4	0.030298	0.178563	0.602128	0.00	0.005271	0.005043	0.0048	0.0051	1367.262	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.90	1.91
10	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	BAK	12	276	0.030298	0.178563	0.602128	0.00	0.005271	0.005043	0.0048	0.0051	1367.262	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.53	4.53
10	Equipment/Materials Delivery	Truck	T7 Tractor Con.	D-55	50/50	110	154.2	0.030298	0.178563	0.602128	0.00	0.005271	0.005043	0.0048	0.0051	1367.262	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	23.19	23.22
10	Employees	Auto	LDA	G-55	SM	4,935	32.4	0.005374	0.357737	0.035538	0.00	0.001084	0.000997														

Drilling Emissions

- Drilling Equipment Emissions
 - Drilling Fugitive Emissions
- Re-Drilling Equipment Emissions
 - Re-Drilling Fugitive Emissions

Drilling Equipment Emission Calculations

Unmitigated

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-2	0.23	1.18	2.51	0.00	0.08	0.08	0.00	0.04	503.78	504.55
-1	3.39	18.12	35.58	0.08	1.11	1.09	0.00	0.55	8,041.03	8,052.62
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.07	0.41	0.06	0.00	0.02	0.02	0.00	0.01	187.25	187.51
3	0.07	0.43	0.61	0.00	0.02	0.02	0.00	0.01	200.52	200.80
4	0.07	0.43	0.54	0.00	0.02	0.02	0.00	0.01	200.53	200.81
5	2.70	18.05	20.43	0.08	0.64	0.63	0.00	0.52	8,515.76	8,526.73
6	0.11	0.79	0.80	0.00	0.02	0.02	0.00	0.02	374.61	375.09
7	0.43	3.02	3.04	0.01	0.09	0.09	0.00	0.09	1,431.46	1,433.31
8	0.17	1.22	1.23	0.01	0.04	0.04	0.00	0.04	575.15	575.90
9	0.15	1.03	1.04	0.00	0.03	0.03	0.00	0.04	488.12	488.76
10	0.40	2.77	2.79	0.01	0.09	0.08	0.00	0.08	1,314.34	1,316.04
11	0.52	4.12	1.98	0.02	0.06	0.06	0.00	0.04	2,104.25	2,105.08
12	0.35	2.81	1.35	0.01	0.04	0.04	0.00	0.03	1,436.08	1,436.65
13	0.39	3.07	1.48	0.02	0.05	0.05	0.00	0.03	1,569.80	1,570.42
14	0.13	1.01	0.48	0.01	0.02	0.02	0.00	0.01	513.69	513.89
15	0.44	3.48	1.67	0.02	0.05	0.05	0.00	0.03	1,775.53	1,776.23
16	0.88	7.53	2.55	0.04	0.08	0.08	0.00	0.07	3,852.24	3,853.63
17	0.16	1.41	0.48	0.01	0.02	0.02	0.00	0.01	720.05	720.31
18	0.16	1.41	0.48	0.01	0.02	0.02	0.00	0.01	720.05	720.31
19	0.16	1.41	0.48	0.01	0.02	0.02	0.00	0.01	720.05	720.31
20	0.16	1.41	0.48	0.01	0.02	0.02	0.00	0.01	720.05	720.31
21	0.16	1.41	0.41	0.01	0.01	0.01	0.00	0.01	720.05	720.31
22	0.16	1.41	0.41	0.01	0.01	0.01	0.00	0.01	720.05	720.31
23	0.16	1.41	0.41	0.01	0.01	0.01	0.00	0.01	720.05	720.31
24	0.16	1.41	0.41	0.01	0.01	0.01	0.00	0.01	720.05	720.31
25	0.16	1.41	0.41	0.01	0.01	0.01	0.00	0.01	720.05	720.31
26	0.16	1.41	0.41	0.01	0.01	0.01	0.00	0.01	720.05	720.31
27	0.16	1.41	0.41	0.01	0.01	0.01	0.00	0.01	720.05	720.31
28	0.16	1.41	0.41	0.01	0.01	0.01	0.00	0.01	720.05	720.31
29	0.16	1.41	0.41	0.01	0.01	0.01	0.00	0.01	720.05	720.31
30	0.16	1.41	0.41	0.01	0.01	0.01	0.00	0.01	720.05	720.31

1. Emissions calculated using the CalEEMod v2013.2.2 Program
2. Equipment size and use based on Applicant submittal
3. Total Equipment operating hours per month and year were provided by the Applicant submittal.
4. Annual hours were divided by annual working days to obtain hours per day per piece of equipment. If hours/day exceeded 24 hours then 2 pieces were assumed etc.
5. Off-site vehicle emissions are included in the offsite calculations because they are certified for on-road use.

Drilling Equipment Emission Calculations

Mitigated - Tier 4 Engines

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-2	0.06	2.21	0.27	0.00	0.01	0.01	0.00	0.04	503.78	504.54
-1	0.96	35.26	4.34	0.08	0.13	0.13	0.00	0.55	8,041.02	8,052.61
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.02	0.82	0.10	0.00	0.00	0.00	0.00	0.01	187.25	187.51
3	0.02	0.88	0.11	0.00	0.00	0.00	0.00	0.01	200.52	200.80
4	0.02	0.88	0.11	0.00	0.00	0.00	0.00	0.01	200.53	200.81
5	1.02	37.43	4.60	0.08	0.14	0.14	0.00	0.52	8,525.75	8,526.72
6	0.04	1.65	0.20	0.00	0.01	0.01	0.00	0.02	374.61	375.09
7	0.17	6.29	0.77	0.01	0.02	0.02	0.00	0.09	1,431.46	1,433.30
8	0.07	2.53	0.31	0.01	0.01	0.01	0.00	0.04	575.15	575.90
9	0.06	2.15	0.26	0.00	0.01	0.01	0.00	0.03	488.12	488.76
10	0.16	5.78	0.71	0.01	0.02	0.02	0.00	0.08	1,314.34	1,316.04
11	0.25	9.03	1.11	0.02	0.03	0.03	0.00	0.04	2,104.25	2,105.08
12	0.17	6.16	0.76	0.01	0.02	0.02	0.00	0.03	1,436.08	1,436.64
13	0.18	6.74	0.83	0.02	0.02	0.02	0.00	0.03	1,569.80	1,570.42
14	0.06	2.20	0.27	0.01	0.01	0.01	0.00	0.01	513.69	513.89
15	0.21	7.62	0.94	0.02	0.03	0.03	0.00	0.03	1,775.53	1,776.23
16	0.45	16.52	2.02	0.04	0.06	0.06	0.00	0.07	3,852.23	3,853.62
17	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
18	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
19	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
20	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
21	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
22	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
23	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
24	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
25	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
26	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
27	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
28	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
29	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31
30	0.08	3.09	0.38	0.01	0.01	0.01	0.00	0.01	720.05	720.31

1. Emissions calculated using the CalEEMod v2013.2.2 Program
2. Equipment size and use based on Applicant submittal
3. Total Equipment operating hours per month and year were provided by the Applicant submittal.
4. Annual hours were divided by annual working days to obtain hours per day per piece of equipment. If hours/day exceeded 24 hours then 2 pieces were assumed etc.
5. Off-site vehicle emissions are included in the offsite calculations because they are certified for on-road use.
6. Tier 4 Final equipment was used to mitigate the drilling emissions.

AERA - Santa Barbara County - Cat Canyon - ECC Project

Drilling Fugitive Dust Emission Calculations

Unmitigated		Unpaved Milage per RT: 0.6			
Year	Activity/Source	Average Source	Emissions Factor	Tons/Year	
				PM10	PM2.5
-2	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
-2	Unpaved Roads Trucks	36.6	CalEEMod	0.025	0.002
-1	Unpaved Roads Autos	8826.6	CalEEMod	5.838	0.583
-1	Unpaved Roads Trucks	619.2	CalEEMod	0.410	0.041
2	Unpaved Roads Autos	733.2	CalEEMod	0.485	0.048
2	Unpaved Roads Trucks	13.8	CalEEMod	0.009	0.001
3	Unpaved Roads Autos	733.2	CalEEMod	0.485	0.048
3	Unpaved Roads Trucks	13.8	CalEEMod	0.009	0.001
4	Unpaved Roads Autos	733.2	CalEEMod	0.485	0.048
4	Unpaved Roads Trucks	13.8	CalEEMod	0.009	0.001
5	Unpaved Roads Autos	8854.8	CalEEMod	5.856	0.585
5	Unpaved Roads Trucks	643.2	CalEEMod	0.424	0.042
6	Unpaved Roads Autos	1494.6	CalEEMod	0.989	0.099
6	Unpaved Roads Trucks	28.8	CalEEMod	0.019	0.002
7	Unpaved Roads Autos	3722.4	CalEEMod	2.462	0.246
7	Unpaved Roads Trucks	108	CalEEMod	0.073	0.007
8	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
8	Unpaved Roads Trucks	42.6	CalEEMod	0.029	0.003
9	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
9	Unpaved Roads Trucks	36.6	CalEEMod	0.025	0.002
10	Unpaved Roads Autos	2961	CalEEMod	1.958	0.196
10	Unpaved Roads Trucks	99	CalEEMod	0.067	0.007
11	Unpaved Roads Autos	4455.6	CalEEMod	2.947	0.294
11	Unpaved Roads Trucks	151.8	CalEEMod	0.100	0.010
12	Unpaved Roads Autos	2989.2	CalEEMod	1.977	0.197
12	Unpaved Roads Trucks	103.2	CalEEMod	0.067	0.007
13	Unpaved Roads Autos	3666	CalEEMod	2.425	0.242
13	Unpaved Roads Trucks	112.2	CalEEMod	0.072	0.007
14	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
14	Unpaved Roads Trucks	36.6	CalEEMod	0.025	0.002
15	Unpaved Roads Autos	3694.2	CalEEMod	2.443	0.244
15	Unpaved Roads Trucks	126	CalEEMod	0.083	0.008
16	Unpaved Roads Autos	8093.4	CalEEMod	5.353	0.534
16	Unpaved Roads Trucks	252	CalEEMod	0.171	0.017
17	Unpaved Roads Autos	1494.6	CalEEMod	0.988	0.099
17	Unpaved Roads Trucks	49.8	CalEEMod	0.034	0.003
18	Unpaved Roads Autos	1494.6	CalEEMod	0.988	0.099
18	Unpaved Roads Trucks	49.8	CalEEMod	0.034	0.003
19	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
19	Unpaved Roads Trucks	49.8	CalEEMod	0.033	0.003
20	Unpaved Roads Autos	1438.2	CalEEMod	0.951	0.095
20	Unpaved Roads Trucks	49.8	CalEEMod	0.032	0.003
21	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
21	Unpaved Roads Trucks	49.8	CalEEMod	0.033	0.003
22	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
22	Unpaved Roads Trucks	49.8	CalEEMod	0.033	0.003
23	Unpaved Roads Autos	1494.6	CalEEMod	0.988	0.099
23	Unpaved Roads Trucks	49.8	CalEEMod	0.034	0.003
24	Unpaved Roads Autos	1494.6	CalEEMod	0.988	0.099
24	Unpaved Roads Trucks	49.8	CalEEMod	0.034	0.003
25	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
25	Unpaved Roads Trucks	49.8	CalEEMod	0.033	0.003
26	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
26	Unpaved Roads Trucks	49.8	CalEEMod	0.033	0.003
27	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
27	Unpaved Roads Trucks	49.8	CalEEMod	0.033	0.003
28	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
28	Unpaved Roads Trucks	49.8	CalEEMod	0.033	0.003
29	Unpaved Roads Autos	1494.6	CalEEMod	0.988	0.099
29	Unpaved Roads Trucks	49.8	CalEEMod	0.034	0.003
30	Unpaved Roads Autos	1466.4	CalEEMod	0.970	0.097
30	Unpaved Roads Trucks	49.8	CalEEMod	0.033	0.003

1. Unpaved road traveled emissions were calculated using CalEEMod which used the following methodology.

$$EF = \left(\left[\left(k \times (s/12)^2 \times (S/30)^{0.5} \right) / \left((M/0.5)^{0.2} \right) \right] \times C \right) \times [1 - (P/365)]$$

Where,

EF = emission factor

k = particle size multiplier

s = surface material silt content (%)

M = surface material moisture content (%)

S = mean vehicle speed (mph)

C = emissions factor for 1980's vehicle fleet exhaust, brake wear and tire wear

P = number of days in a year with at least 0.254 mm of precipitation

Then,

$$E = EF \times VMT$$

Where,

E = emissions

EF = emission factor

VMT = unpaved vehicle miles traveled

Drilling Fugitive Dust Emission Calculations

Mitigated		Unpaved Milage per RT: 0.6				
Year	Activity/Source	Average Source	Source Units	Emissions Factor	Tons/Year	
					PM10	PM2.5
-2	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
-2	Unpaved Roads Trucks	36.6	miles/year	CalEEMod	0.006	0.001
-1	Unpaved Roads Autos	8826.6	miles/year	CalEEMod	1.394	0.139
-1	Unpaved Roads Trucks	619.2	miles/year	CalEEMod	0.098	0.010
2	Unpaved Roads Autos	733.2	miles/year	CalEEMod	0.116	0.012
2	Unpaved Roads Trucks	13.8	miles/year	CalEEMod	0.002	0.000
3	Unpaved Roads Autos	733.2	miles/year	CalEEMod	0.116	0.012
3	Unpaved Roads Trucks	13.8	miles/year	CalEEMod	0.002	0.000
4	Unpaved Roads Autos	733.2	miles/year	CalEEMod	0.116	0.012
4	Unpaved Roads Trucks	13.8	miles/year	CalEEMod	0.002	0.000
5	Unpaved Roads Autos	8854.8	miles/year	CalEEMod	1.398	0.139
5	Unpaved Roads Trucks	643.2	miles/year	CalEEMod	0.101	0.010
6	Unpaved Roads Autos	1494.6	miles/year	CalEEMod	0.236	0.024
6	Unpaved Roads Trucks	28.8	miles/year	CalEEMod	0.005	0.000
7	Unpaved Roads Autos	3722.4	miles/year	CalEEMod	0.588	0.059
7	Unpaved Roads Trucks	108	miles/year	CalEEMod	0.018	0.002
8	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
8	Unpaved Roads Trucks	42.6	miles/year	CalEEMod	0.007	0.001
9	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
9	Unpaved Roads Trucks	36.6	miles/year	CalEEMod	0.006	0.001
10	Unpaved Roads Autos	2961	miles/year	CalEEMod	0.468	0.047
10	Unpaved Roads Trucks	99	miles/year	CalEEMod	0.016	0.002
11	Unpaved Roads Autos	4455.6	miles/year	CalEEMod	0.704	0.070
11	Unpaved Roads Trucks	151.8	miles/year	CalEEMod	0.024	0.002
12	Unpaved Roads Autos	2989.2	miles/year	CalEEMod	0.472	0.047
12	Unpaved Roads Trucks	103.2	miles/year	CalEEMod	0.016	0.002
13	Unpaved Roads Autos	3666	miles/year	CalEEMod	0.579	0.058
13	Unpaved Roads Trucks	112.2	miles/year	CalEEMod	0.017	0.002
14	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
14	Unpaved Roads Trucks	36.6	miles/year	CalEEMod	0.006	0.001
15	Unpaved Roads Autos	3694.2	miles/year	CalEEMod	0.583	0.058
15	Unpaved Roads Trucks	126	miles/year	CalEEMod	0.020	0.002
16	Unpaved Roads Autos	8093.4	miles/year	CalEEMod	1.278	0.127
16	Unpaved Roads Trucks	252	miles/year	CalEEMod	0.041	0.004
17	Unpaved Roads Autos	1494.6	miles/year	CalEEMod	0.236	0.024
17	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
18	Unpaved Roads Autos	1494.6	miles/year	CalEEMod	0.236	0.024
18	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
19	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
19	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
20	Unpaved Roads Autos	1438.2	miles/year	CalEEMod	0.227	0.023
20	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
21	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
21	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
22	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
22	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
23	Unpaved Roads Autos	1494.6	miles/year	CalEEMod	0.236	0.024
23	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
24	Unpaved Roads Autos	1494.6	miles/year	CalEEMod	0.236	0.024
24	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
25	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
25	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
26	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
26	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
27	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
27	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
28	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
28	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
29	Unpaved Roads Autos	1494.6	miles/year	CalEEMod	0.236	0.024
29	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001
30	Unpaved Roads Autos	1466.4	miles/year	CalEEMod	0.232	0.023
30	Unpaved Roads Trucks	49.8	miles/year	CalEEMod	0.008	0.001

1. Unpaved road traveled emissions were calculated using CalEEMod which used the following methodology.

$$EF = \left(\left[\left(k \times (s/12)^2 \times (S/30)^{0.5} \right) / \left((M/0.5)^{0.2} \right) \right] \times C \right) \times [1 - (P/365)]$$

Where,

EF = emission factor

k = particle size multiplier

s = surface material silt content (%)

M = surface material moisture content (%)

S = mean vehicle speed (mph)

C = emissions factor for 1980's vehicle fleet exhaust, brake wear and tire wear

P = number of days in a year with at least 0.254 mm of precipitation

Then,

$$E = EF \times VMT$$

Where,

E = emissions

EF = emission factor

VMT = unpaved vehicle miles traveled

4. Mitigation selected in CalEEMod were watering 3 times per day and reduce vehicle speed to less than 15 mph.

5. CalEEMod does not give mitigation credit for water to unpaved road travel since the model thinks it is offsite travel so a 61% additional reduction was taken manually to account for the onsite unpaved roads being watered 3 times daily.

Replacemnt Well Drilling Equipment Emission Calculations

Unmitigated

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
2019	0.04	0.22	0.44	0.001	0.014	0.014	0.00	0.007	98.96	99.10
2020	0.04	0.22	0.39	0.001	0.012	0.012	0.00	0.007	98.70	98.84
2021	0.03	0.22	0.34	0.001	0.011	0.011	0.00	0.006	98.70	98.83
2022	0.03	0.21	0.30	0.001	0.010	0.009	0.00	0.006	98.72	98.85
2023	0.03	0.21	0.26	0.001	0.008	0.008	0.00	0.006	98.72	98.85
2024	0.03	0.21	0.24	0.001	0.007	0.007	0.00	0.006	98.73	98.86
2025	0.03	0.21	0.21	0.001	0.006	0.006	0.00	0.006	98.72	98.85
2026	0.03	0.21	0.21	0.001	0.006	0.006	0.00	0.006	98.72	98.85
2027	0.03	0.21	0.21	0.001	0.006	0.006	0.00	0.006	98.72	98.85
2028	0.03	0.21	0.21	0.001	0.006	0.006	0.00	0.006	101.05	98.85
2029	0.03	0.21	0.21	0.001	0.006	0.006	0.00	0.002	101.05	98.85
2030	0.03	0.20	0.09	0.001	0.003	0.003	0.00	0.002	101.05	101.09
2031	0.03	0.20	0.09	0.001	0.003	0.003	0.00	0.002	101.05	101.09
2032	0.03	0.20	0.09	0.001	0.003	0.003	0.00	0.002	101.05	101.09
2033	0.03	0.20	0.09	0.001	0.003	0.003	0.00	0.002	101.05	101.09
2034	0.03	0.20	0.09	0.001	0.003	0.003	0.00	0.002	101.05	101.09
2035	0.02	0.20	0.07	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2036	0.02	0.20	0.07	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2037	0.02	0.20	0.07	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2038	0.02	0.20	0.07	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2039	0.02	0.20	0.07	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2040	0.02	0.20	0.06	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2041	0.02	0.20	0.06	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2042	0.02	0.20	0.06	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2043	0.02	0.20	0.06	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2044	0.02	0.20	0.06	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2045	0.02	0.20	0.06	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2046	0.02	0.20	0.06	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2047	0.02	0.20	0.06	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2048	0.02	0.20	0.06	0.001	0.002	0.002	0.00	0.002	101.05	101.09

1. Emissions calculated using the CalEEMod v2013.2.2 Program
2. Equipment size and use based on Applicant submittal
3. Total Equipment operating hours per well were provided by the Applicant submittal.
4. Total hours were divided by working days to obtain hours per day per piece of equipment. If hours/day exceeded 24 hours then 2 pieces were assumed etc.
5. Off-site vehicle emissions are included in the offsite calculations because they are certified for on-road use.

Replacement Well Drilling Equipment Emission Calculations

Mitigated - Tier 4 Engines

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
2019	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.007	98.96	99.10
2020	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.007	98.70	98.84
2021	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.006	98.70	98.83
2022	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.006	98.72	98.85
2023	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.006	98.72	98.85
2024	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.006	98.73	98.86
2025	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.006	98.72	98.85
2026	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.006	98.72	98.85
2027	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.006	98.72	98.85
2028	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.006	101.05	98.85
2029	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	98.85
2030	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2031	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2032	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2033	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2034	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2035	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2036	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2037	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2038	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2039	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2040	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2041	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2042	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2043	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2044	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2045	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2046	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2047	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09
2048	0.01	0.43	0.05	0.001	0.002	0.002	0.00	0.002	101.05	101.09

1. Emissions calculated using the CalEEMod v2013.2.2 Program
2. Equipment size and use based on Applicant submittal
3. Total Equipment operating hours per well were provided by the Applicant submittal.
4. Total hours were divided by working days to obtain hours per day per piece of equipment. If hours/day exceeded 24 hours then 2 pieces were assumed etc.
5. Off-site vehicle emissions are included in the offsite calculations because they are certified for on-road use.
6. Tier 4 Final equipment was used to mitigate the re-drilling emissions.

Replacement Well Drilling Fugitive Dust Emission Calculations

Unmitigated

Unpaved Milage per RT: 0.6

Year	Activity/Source	Average Source	Source Units	Emissions Factor	Tons/Year	
					PM10	PM2.5
2019	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2019	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2020	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2020	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2021	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2021	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2022	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2022	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2023	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2023	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2024	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2024	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
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2026	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2026	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2027	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2027	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2028	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2028	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2029	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2029	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
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2031	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2032	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2032	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2033	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2033	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2034	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
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2035	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2035	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2036	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2036	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
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2042	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2042	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2043	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2043	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2044	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2044	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2045	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2045	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2046	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2046	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2047	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2047	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000
2048	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.048	0.005
2048	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.004	0.000

1. Unpaved road traveled emissions were calculated using CalEEMod which used the following methodology.

$$EF = \{[(k \times (s/12)^3 \times (S/30)^{0.5}) / ((M/0.5)^{0.2})] - C\} \times [1 - (P/365)]$$

Where,

EF = emission factor

k = particle size multiplier

s = surface material silt content (%)

M = surface material moisture content (%)

S = mean vehicle speed (mph)

C = emissions factor for 1980's vehicle fleet exhaust, brake wear and tire wear

P = number of days in a year with at least 0.254 mm of precipitation

Then,

E = EF x VMT

Where,

E = emissions

EF = emission factor

VMT = unpaved vehicle miles traveled

Replacement Well Drilling Fugitive Dust Emission Calculations

Mitigated

Year	Activity/Source	Average Source	Source Units	Emissions Factor	Tons/Year	
					PM10	PM2.5
2019	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.012	0.001
2019	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.001	0.000
2020	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.012	0.001
2020	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.001	0.000
2021	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.012	0.001
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2042	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.001	0.000
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2043	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.001	0.000
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2047	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.001	0.000
2048	Unpaved Roads Autos	73.2	miles/year	CalEEMod	0.012	0.001
2048	Unpaved Roads Trucks	4.8	miles/year	CalEEMod	0.001	0.000

1. Unpaved road traveled emissions were calculated using CalEEMod which used the following methodology.

$$EF = \{[(k \times (s/12)^3 \times (S/30)^{0.5}) / ((M/0.5)^{0.2})] - C\} \times [1 - (P/365)]$$

Where,

EF = emission factor

k = particle size multiplier

s = surface material silt content (%)

M = surface material moisture content (%)

S = mean vehicle speed (mph)

C = emissions factor for 1980's vehicle fleet exhaust, brake wear and tire wear

P = number of days in a year with at least 0.254 mm of precipitation

Then,

E = EF x VMT

Where,

E = emissions

EF = emission factor

VMT = unpaved vehicle miles traveled

4. Mitigation selected in CalEEMod were watering 3 times per day and reduce vehicle speed to less than 15 mph.

5. CalEEMod does not give mitigation credit for water to unpaved road travel since the model thinks it is offsite travel so a 61% additional reduction was taken manually to account for the onsite unpaved roads being watered 3 times daily.

Non-Stationary Source Operational Emissions

- Trip Generation Day to Day Operations
 - Tanker Trips and Mileage
- Operating Mobile Emissions Excluding Tankers
 - Operating Tankers Emissions
- Operations and Maintenance Emissions
 - Operational Fugitive Dust Emissions

EAST CAT CANYON OIL FIELD REDEVELOPMENT PROJECT

Max Year 2029

(Provided by AERA)

TRIP GENERATION _ DAY-TO-DAY OPERATIONS (non-construction periods)

Project Component	Number/Day	Shift	ADT	AM Peak		PM Peak	
				In	Out	In	Out
EMPLOYEES							
9/80 Employees (a)	79	6:30 AM - 4:15 PM	237	0	0	0	79
12 hr. Employees (b)	26	6:00 AM/PM - 6:00 PM/AM	78	0	0	0	0
TRUCKS							
Miscellaneous Truck Deliveries(d)	5	NA	10	0	1	1	0
Crude Import/Export via Truck ()	99	NA	199	4	4	4	4
MISCELLANEOUS TRIPS (c)	4	NA	8	0	1	1	0

(a) 9/80 workers. Shift starts at 6:30 A.M. and ends at 4:15 P.M. ADT assumes 50% of employee leave site for lunch break.

(b) 12 hour shift workers. Shifts = 6:00 A.M. to 6:00 P.M.; and 6:00 P.M. to 6:00 A.M. ADT assumes 50% of employees leave site for lunch break.

(c) Chemical, sand, and other deliveries via trucks. ADT assumes one inbound + one outbound trip per delivery.
A.M. and P.M. peak hour trips assume 10% of trips during each peak hour period.

(d) Crude export via trucks = 2/hr = 48 per day. ADT assumes one inbound + one outbound trip per delivery.
A.M. and P.M. peak hour trips assume 2 trips during each peak hour period.

(e) Miscellaneous trips including visitors, fed-ex, other support materials and staff for drilling operations not accounted for in Trucks category.
ADT assumes one inbound + one outbound trip per delivery. A.M. and P.M. peak hour trips assume 10% of trips during each peak hour period.

EAST CAT CANYON OIL FIELD REDEVELOPMENT PROJECT
Tankering Trips and Mileage
Daily Average Trips

Year	Cat Canyon Oil Production (BPD)	Light Oil Mix Ratio (based upon 12 API Crude Export)	Required Light Oil for API 12 Blended Crude (BPD)	Light Oil Import ¹		Total Blended Crude Oil Transported (BPD)	Blended Crude Oil Export ²						Total All Trucks											
							Blended Crude Oil in Light Oil Trucks		Blended Crude Only Trucks		Total				Blended Crude Oil Export		Total Export Blended Oil Trucks							
							Truck Miles per day	Average Trucks per day	Truck Miles per day	Average Trucks per day	Truck Miles per day	Average Trucks per day			Truck Miles per day	Average Trucks per day	Blended Crude Oil in Light Oil Trucks	Blended Crude Only Trucks	Total Export Blended Oil Trucks	Trucks	ADT			
2021	2,913	0.225	655	575	4.1	3,568	575	4.1	6,007	21.4	6,582	25.5	20.5	20.5	20.5	73.5	147.0	94.0	167.6	94.0	188.1	Total Miles per day	one-way miles per trip	
2022	4,044	0.225	910	798	5.7	4,954	798	5.7	8,339	29.7	9,138	35.4	5.7	5.7	5.7	5.7	29.7	59.4	35.4	65.1	35.4	70.8	9,936	140.4
2023	4,379	0.309	1,353	1,187	8.5	5,732	1,187	8.5	9,122	32.5	10,310	40.9	8.5	8.5	8.5	8.5	32.5	65.0	40.9	73.4	40.9	81.9	11,497	140.4
2024	4,422	0.309	1,366	1,199	8.5	5,788	1,199	8.5	9,212	32.8	10,411	41.3	8.5	8.5	8.5	8.5	32.8	65.6	41.3	74.2	41.3	82.7	11,610	140.4
2025	4,625	0.309	1,429	1,254	8.9	6,054	1,254	8.9	9,635	34.3	10,889	43.2	8.9	8.9	8.9	8.9	34.3	68.6	43.2	77.6	43.2	86.5	12,143	140.4
2026	7,171	0.309	2,216	1,944	13.8	9,387	1,944	13.8	14,939	53.2	16,883	67.0	13.8	13.8	13.8	13.8	53.2	106.4	67.0	120.2	67.0	134.1	18,827	140.4
2027	8,297	0.317	2,630	2,308	16.4	10,927	2,308	16.4	17,301	61.6	19,609	78.1	16.4	16.4	16.4	16.4	61.6	123.2	78.1	139.7	78.1	156.1	21,917	140.4
2028	9,013	0.317	2,857	2,507	17.9	11,870	2,507	17.9	18,794	66.9	21,301	84.8	17.9	17.9	17.9	17.9	66.9	133.9	84.8	151.7	84.8	169.6	23,808	140.4
2029	9,194	0.324	2,979	2,614	18.6	12,173	2,614	18.6	19,187	68.3	21,801	86.9	18.6	18.6	18.6	18.6	68.3	136.7	86.9	155.3	86.9	173.9	24,415	140.4
2030	9,769	0.324	3,165	2,777	19.8	12,934	2,777	19.8	20,387	72.6	23,165	92.4	19.8	19.8	19.8	19.8	72.6	145.2	92.4	165.0	92.4	184.8	25,942	140.4
2031	9,883	0.332	3,281	2,879	20.5	13,164	2,879	20.5	20,645	73.5	23,524	94.0	20.5	20.5	20.5	20.5	73.5	147.0	94.0	167.6	94.0	188.1	26,404	140.4
2032	9,745	0.332	3,235	2,839	20.2	12,980	2,839	20.2	20,357	72.5	23,196	92.7	20.2	20.2	20.2	20.2	72.5	145.0	92.7	165.2	92.7	185.4	26,035	140.4
2033	9,222	0.332	3,062	2,687	19.1	12,284	2,687	19.1	19,264	68.6	21,951	87.7	19.1	19.1	19.1	19.1	68.6	137.2	87.7	156.3	87.7	175.5	24,638	140.4
2034	8,976	0.332	2,980	2,615	18.6	11,956	2,615	18.6	18,750	66.8	21,365	85.4	18.6	18.6	18.6	18.6	66.8	133.6	85.4	152.2	85.4	170.8	23,980	140.4
2035	9,011	0.332	2,992	2,625	18.7	12,003	2,625	18.7	18,824	67.0	21,449	85.7	18.7	18.7	18.7	18.7	67.0	134.1	85.7	152.8	85.7	171.5	24,074	140.4
2036	8,999	0.332	2,988	2,622	18.7	11,987	2,622	18.7	18,798	66.9	21,420	85.6	18.7	18.7	18.7	18.7	66.9	133.9	85.6	152.6	85.6	171.2	24,042	140.4
2037	9,041	0.332	3,002	2,634	18.8	12,043	2,634	18.8	18,886	67.3	21,520	86.0	18.8	18.8	18.8	18.8	67.3	134.5	86.0	153.3	86.0	172.0	24,154	140.4
2038	9,265	0.332	3,076	2,699	19.2	12,341	2,699	19.2	19,354	68.9	22,053	88.1	19.2	19.2	19.2	19.2	68.9	137.8	88.1	157.1	88.1	176.3	24,752	140.4
2039	9,149	0.332	3,037	2,665	19.0	12,186	2,665	19.0	19,112	68.1	21,777	87.0	19.0	19.0	19.0	19.0	68.1	136.1	87.0	155.1	87.0	174.1	24,443	140.4
2040	8,735	0.332	2,900	2,545	18.1	11,635	2,545	18.1	18,247	65.0	20,792	83.1	18.1	18.1	18.1	18.1	65.0	130.0	83.1	148.1	83.1	166.2	23,337	140.4
2041	8,464	0.332	2,810	2,466	17.6	11,274	2,466	17.6	17,681	63.0	20,147	80.5	17.6	17.6	17.6	17.6	63.0	125.9	80.5	143.5	80.5	161.1	22,613	140.4
2042	8,196	0.332	2,721	2,388	17.0	10,917	2,388	17.0	17,121	61.0	19,509	78.0	17.0	17.0	17.0	17.0	61.0	121.9	78.0	139.0	78.0	156.0	21,897	140.4
2043	7,965	0.332	2,644	2,320	16.5	10,609	2,320	16.5	16,638	59.3	18,959	75.8	16.5	16.5	16.5	16.5	59.3	118.5	75.8	135.0	75.8	151.6	21,279	140.4
2044	7,737	0.332	2,569	2,254	16.1	10,306	2,254	16.1	16,162	57.6	18,416	73.6	16.1	16.1	16.1	16.1	57.6	115.1	73.6	131.2	73.6	147.2	20,670	140.4
2045	7,441	0.332	2,470	2,168	15.4	9,911	2,168	15.4	15,544	55.4	17,712	70.8	15.4	15.4	15.4	15.4	55.4	110.7	70.8	126.2	70.8	141.6	19,879	140.4
2046	7,202	0.332	2,391	2,098	14.9	9,593	2,098	14.9	15,045	53.6	17,143	68.5	14.9	14.9	14.9	14.9	53.6	107.2	68.5	122.1	68.5	137.0	19,241	140.4
2047	6,985	0.332	2,319	2,035	14.5	9,304	2,035	14.5	14,591	52.0	16,626	66.5	14.5	14.5	14.5	14.5	52.0	103.9	66.5	118.4	66.5	132.9	18,661	140.4
2048	6,727	0.332	2,233	1,960	14.0	8,960	1,960	14.0	14,052	50.0	16,012	64.0	14.0	14.0	14.0	14.0	50.0	100.1	64.0	114.0	64.0	128.0	17,972	140.4
2049	6,476	0.332	2,150	1,887	13.4	8,626	1,887	13.4	13,528	48.2	15,415	61.6	13.4	13.4	13.4	13.4	48.2	96.4	61.6	109.8	61.6	123.2	17,301	140.4
2050	6,187	0.332	2,054	1,802	12.8	8,241	1,802	12.8	12,924	46.0	14,727	58.9	12.8	12.8	12.8	12.8	46.0	92.1	58.9	104.9	58.9	117.7	16,529	140.4
2051	5,298	0.332	1,759	1,543	11.0	7,057	1,543	11.0	11,067	39.4	12,611	50.4	11.0	11.0	11.0	11.0	39.4	78.8	50.4	89.8	50.4	100.8	14,154	140.4
2052	5,066	0.332	1,682	1,476	10.5	6,748	1,476	10.5	10,583	37.7	12,059	48.2	10.5	10.5	10.5	10.5	37.7	75.4	48.2	96.4	48.2	96.4	13,534	140.4

Note:

- Light oil truck miles traveled is based on light oil coming from the Belridge Facility. However, light oil trucks could come from a number of different locations over the life of the project. However, the most likely scenario has all light oil coming from Belridge facility.
- Blended crude oil truck miles is made up of both one way trips (using trucks that imported light oil) and round trips (trucks will arrive at Cat canyon empty and return full of blended crude). It has been assumed that all trucks will travel to and from the Belridge facility. It has been assumed that all light oil trucks will back haul blended crude oil to the Belridge facility.

ADT-Average Daily Trips

Assumptions

One-Way Truck Trip Miles	140.4	139.4 miles to Gate D at Belridge facility plus 1.0 miles on Belridge facility roads.
Barrels per Truck of Light Oil	160	Based on 30 API gravity light crude at 94% of maximum tanker truck load.
Barrels per Truck of Export Oil Blend	140	Based on 12 API gravity crude at 93% of maximum tanker truck load.

EAST CAT CANYON OIL FIELD REDEVELOPMENT PROJECT
Tankering Trips and Mileage
Peak Day Trips

Year	Cat Canyon Oil Production (BPD)	Light Oil Mix Ratio (based upon 12 API Crude Export)	Required Light Oil for API 12 Blended Crude (BPD)	Light Oil Import ¹		Total Blended Crude Oil Transported (BPD)	Blended Crude Oil Export ²						Light Oil Import		Blended Crude Oil Export						Total All Trucks			
							Blended Crude Oil in Light Oil Trucks			Blended Crude Only Trucks			Total		Blended Crude Oil in Light Oil Trucks		Blended Crude Only Trucks		Total Export Blended Oil Trucks				Total Miles	one-way miles per trip
				Truck Miles per day	Max Trucks per day		Truck Miles per day	Max Trucks per day	Truck Miles per day	Max Trucks per day	Truck Miles per day	Max Trucks per day	Truck Miles per day	Max Trucks per day	Truck Miles per day	Max Trucks per day	Truck Miles per day	Max Trucks per day	Truck Miles per day	Max Trucks per day	Truck Miles per day	Max Trucks per day		
				21	21		21	21	74	148	95	169	95	190	21	21	21	21	74	148	95	169	95	190
Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max				
Trucks per day	PDT	Trucks per day	PDT	Trucks per day	PDT	Trucks per day	PDT	Trucks per day	PDT	Trucks per day	PDT	Trucks per day	PDT	Trucks per day	PDT	Trucks per day	PDT	Trucks per day	PDT	Trucks per day	PDT			
2021	2,913	0.225	655	702	5	3,568	702	5	5,897	21	6,599	26												
2022	4,044	0.225	910	842	6	4,954	842	6	8,424	30	9,266	36												
2023	4,379	0.309	1,353	1,264	9	5,732	1,264	9	8,986	32	10,249	41												
2024	4,422	0.309	1,366	1,264	9	5,788	1,264	9	9,266	33	10,530	42												
2025	4,625	0.309	1,429	1,264	9	6,054	1,264	9	9,828	35	11,092	44												
2026	7,171	0.309	2,216	1,966	14	9,387	1,966	14	15,163	54	17,129	68												
2027	8,297	0.317	2,630	2,387	17	10,927	2,387	17	17,410	62	19,796	79												
2028	9,013	0.317	2,857	2,527	18	11,870	2,527	18	18,814	67	21,341	85												
2029	9,194	0.324	2,979	2,668	19	12,173	2,668	19	19,094	68	21,762	87												
2030	9,769	0.324	3,165	2,808	20	12,934	2,808	20	20,498	73	23,306	93												
2031	9,883	0.332	3,281	2,948	21	13,164	2,948	21	20,779	74	23,728	95												
2032	9,745	0.332	3,235	2,948	21	12,980	2,948	21	20,218	72	23,166	93												
2033	9,222	0.332	3,062	2,808	20	12,284	2,808	20	19,094	68	21,902	88												
2034	8,976	0.332	2,980	2,668	19	11,956	2,668	19	18,814	67	21,481	86												
2035	9,011	0.332	2,992	2,668	19	12,003	2,668	19	18,814	67	21,481	86												
2036	8,999	0.332	2,988	2,668	19	11,987	2,668	19	18,814	67	21,481	86												
2037	9,041	0.332	3,002	2,668	19	12,043	2,668	19	19,094	68	21,762	87												
2038	9,265	0.332	3,076	2,808	20	12,341	2,808	20	19,375	69	22,183	89												
2039	9,149	0.332	3,037	2,668	19	12,186	2,668	19	19,375	69	22,043	88												
2040	8,735	0.332	2,900	2,668	19	11,635	2,668	19	18,252	65	20,920	84												
2041	8,464	0.332	2,810	2,527	18	11,274	2,527	18	17,690	63	20,218	81												
2042	8,196	0.332	2,721	2,527	18	10,917	2,527	18	16,848	60	19,375	78												
2043	7,965	0.332	2,644	2,387	17	10,609	2,387	17	16,567	59	18,954	76												
2044	7,737	0.332	2,569	2,387	17	10,306	2,387	17	16,006	57	18,392	74												
2045	7,441	0.332	2,470	2,246	16	9,911	2,246	16	15,444	55	17,690	71												
2046	7,202	0.332	2,391	2,106	15	9,593	2,106	15	15,163	54	17,269	69												
2047	6,985	0.332	2,319	2,106	15	9,304	2,106	15	14,602	52	16,708	67												
2048	6,727	0.332	2,233	1,966	14	8,960	1,966	14	14,321	51	16,286	65												
2049	6,476	0.332	2,150	1,966	14	8,626	1,966	14	13,478	48	15,444	62												
2050	6,187	0.332	2,054	1,825	13	8,241	1,825	13	12,917	46	14,742	59												
2051	5,298	0.332	1,759	1,544	11	7,057	1,544	11	11,232	40	12,776	51												
2052	5,066	0.332	1,682	1,544	11	6,748	1,544	11	10,670	38	12,215	49												

Note:

- Light oil truck miles traveled is based on light oil coming from the Belridge Facility. However, light oil trucks could come from a number of different locations over the life of the project. However, the most likely scenario has all light oil coming from Belridge facility.
- Blended crude oil truck miles is made up of both one way trips (using trucks that imported light oil) and round trips (trucks will arrive at Cat canyon empty and return full of blended crude). It has been assumed that all trucks will travel to and from the Belridge facility. It has been assumed that all light oil trucks will back haul blended crude oil to the Belridge facility.

PDT=Peak Daily Trips

Assumptions

One-Way Truck Trip Miles	140.4	139.4 miles to Gate D at Belridge facility plus 1.0 miles on Belridge facility roads.
Barrels per Truck of Light Oil	160	Based on 30 API gravity light crude at 94% of maximum tanker truck load.
Barrels per Truck of Oil Crude	140	Based on 12 API gravity crude at 93% of maximum tanker truck load.

Operating Mobile Emissions Excluding Tankers

Vehicle Fleet Mix Aggregate							Daily Emissions													Annual Emissions												
Process	Calendar Year	Vehicle Class	Model Year	Max Daily Trips	# Trips per Year	Annual miles	Daily Miles	ROC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	N2O (lbs/day)	CH4 (lbs/day)	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	PM10 (tons/yr)	PM2.5 (tons/yr)	SOx (tons/yr)	CO2 (tons/yr)	N2O (tons/yr)	CH4 (tons/yr)							
Miscellaneous Trips	2021	T7 Single	Aggregate	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
Miscellaneous Truck Deliveries**	2021	T7 Single	Aggregate	2	174	14,860	174	0.04	0.18	1.66	0.05	0.02	0.01	621.43	0.00	0.00	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
12 Hr. Employees**	2021	LD11	Aggregate	39	14,235	230,607	632	0.04	1.61	0.19	0.07	0.03	0.00	409.49	0.01	0.02	0.01	0.29	0.03	0.01	0.00	0.00	0.00	0.00	0.00							
9/80 Employees**	2021	LD11	Aggregate	24	8760	141,912	389	0.02	0.99	0.42	0.04	0.02	0.01	252.00	0.01	0.01	0.00	0.18	0.02	0.01	0.00	0.00	0.00	0.00	0.00							
							Total	0.10	2.78	2.18	0.15	0.07	0.01	1290.20	0.02	0.04	0.01	0.48	0.14	0.02	0.01	0.00	0.00	0.00	0.00							
Miscellaneous Trips	2022	T7 Single	Aggregate	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
Miscellaneous Truck Deliveries**	2022	T7 Single	Aggregate	2	171	14,860	174	0.04	0.18	1.66	0.05	0.02	0.01	621.43	0.00	0.00	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
12 Hr. Employees**	2022	LD11	Aggregate	39	14,235	230,607	632	0.04	1.61	0.19	0.07	0.03	0.00	394.56	0.01	0.02	0.01	0.26	0.03	0.01	0.00	0.00	0.00	0.00	0.00							
9/80 Employees**	2022	LD11	Aggregate	24	8760	141,912	389	0.02	0.99	0.42	0.04	0.02	0.01	249.80	0.01	0.01	0.00	0.16	0.02	0.01	0.00	0.00	0.00	0.00	0.00							
							Total	0.09	2.54	1.97	0.11	0.04	0.01	1154.79	0.02	0.04	0.01	0.42	0.19	0.02	0.01	0.00	0.00	0.00	0.00	0.00						
Miscellaneous Trips	2023	T7 Single	Aggregate	3	344	210,081	3,833	0.33	1.71	11.71	0.46	0.20	0.06	6387.60	0.02	0.02	0.02	0.02	0.10	0.67	0.03	0.01	0.00	0.00	0.00	0.00						
Miscellaneous Truck Deliveries**	2023	T7 Single	Aggregate	6	681	59,179	1,211	0.09	0.49	3.33	0.13	0.06	0.02	1816.96	0.01	0.01	0.01	0.03	0.19	0.01	0.00	0.00	0.00	0.00	0.00							
12 Hr. Employees**	2023	LD11	Aggregate	47	17,155	277,911	761	0.03	1.58	0.18	0.08	0.03	0.01	456.87	0.02	0.03	0.01	0.29	0.00	0.01	0.01	0.00	0.00	0.00	0.00							
9/80 Employees**	2023	LD11	Aggregate	143	52,955	845,559	2,317	0.10	4.79	0.55	0.24	0.01	0.01	1900.96	0.05	0.08	0.02	0.87	0.10	0.64	0.02	0.00	0.00	0.00	0.00							
							Total	0.56	8.56	15.78	0.90	0.39	0.10	10051.49	0.09	0.13	0.05	1.29	0.99	0.09	0.04	0.01	0.00	0.00	0.00	0.00						
Miscellaneous Trips	2024	T7 Single	Aggregate	4	574	350,471	2,440	0.43	2.25	14.27	0.60	0.26	0.08	8443.69	0.03	0.03	0.03	0.16	1.02	0.04	0.02	0.01	0.00	0.00	0.00							
Miscellaneous Truck Deliveries**	2024	T7 Single	Aggregate	10	1134	98,545	869	0.15	0.80	5.08	0.21	0.09	0.03	8007.20	0.01	0.01	0.01	0.05	0.29	0.01	0.01	0.00	0.00	0.00	0.00							
12 Hr. Employees**	2024	LD11	Aggregate	78	28,470	461,214	1,264	0.06	2.37	0.27	0.13	0.05	0.01	2262.87	0.03	0.04	0.01	0.43	0.05	0.02	0.01	0.00	0.00	0.00	0.00							
9/80 Employees**	2024	LD11	Aggregate	237	86,505	1,401,381	3,839	0.15	7.21	0.82	0.39	0.16	0.02	2308.58	0.09	0.13	0.03	1.32	0.15	0.07	0.03	0.00	0.00	0.00	0.00							
							Total	0.78	12.64	20.44	1.33	0.57	0.14	14386.35	0.15	0.21	0.08	1.96	1.51	0.15	0.06	0.01	0.00	0.00	0.00	0.00						
Miscellaneous Trips	2025	T7 Single	Aggregate	4	578	351,778	2,436	0.42	2.23	13.13	0.59	0.25	0.08	8377.96	0.03	0.03	0.03	0.16	0.95	0.04	0.02	0.01	0.00	0.00	0.00							
Miscellaneous Truck Deliveries**	2025	T7 Single	Aggregate	10	1134	98,545	869	0.15	0.80	4.69	0.21	0.09	0.03	8088.62	0.01	0.01	0.01	0.05	0.27	0.01	0.01	0.00	0.00	0.00	0.00							
12 Hr. Employees**	2025	LD11	Aggregate	78	28,470	461,214	1,264	0.04	2.14	0.24	0.13	0.05	0.01	1995.76	0.03	0.04	0.01	0.39	0.04	0.02	0.01	0.00	0.00	0.00	0.00							
9/80 Employees**	2025	LD11	Aggregate	237	86,505	1,401,381	3,839	0.13	6.51	0.74	0.39	0.16	0.02	2114.05	0.09	0.13	0.02	1.19	0.14	0.07	0.03	0.00	0.00	0.00	0.00							
							Total	0.74	11.69	18.80	1.32	0.56	0.14	14376.46	0.15	0.21	0.07	1.79	1.39	0.15	0.06	0.01	0.00	0.00	0.00	0.00						
Miscellaneous Trips	2026	T7 Single	Aggregate	5	709	287,528	2,025	0.34	1.81	10.11	0.86	0.48	0.02	6933.18	0.02	0.02	0.02	0.12	0.72	0.03	0.01	0.00	0.00	0.00	0.00							
Miscellaneous Truck Deliveries**	2026	T7 Single	Aggregate	10	1134	98,545	869	0.15	0.79	4.34	0.21	0.09	0.03	2971.07	0.01	0.01	0.01	0.04	0.25	0.01	0.00	0.00	0.00	0.00	0.00							
12 Hr. Employees**	2026	LD11	Aggregate	78	28,470	461,214	1,264	0.04	1.91	0.22	0.13	0.05	0.01	1633.90	0.03	0.04	0.01	0.35	0.04	0.02	0.01	0.00	0.00	0.00	0.00							
9/80 Employees**	2026	LD11	Aggregate	237	86,505	1,401,381	3,839	0.11	7.79	0.67	0.39	0.16	0.01	1279.23	0.09	0.12	0.01	0.97	0.12	0.07	0.03	0.01	0.00	0.00	0.00							
							Total	0.64	10.34	15.34	1.21	0.51	0.12	12575.57	0.14	0.21	0.06	1.58	1.13	0.14	0.06	0.01	0.00	0.00	0.00	0.00						
Miscellaneous Trips	2027	T7 Single	Aggregate	6	778	313,542	2,418	0.40	2.19	11.20	0.57	0.24	0.08	8220.41	0.03	0.03	0.03	0.14	0.73	0.04	0.02	0.01	0.00	0.00	0.00							
Miscellaneous Truck Deliveries**	2027	T7 Single	Aggregate	10	1134	98,545	869	0.14	0.79	4.02	0.21	0.09	0.03	2954.32	0.01	0.01	0.01	0.04	0.23	0.01	0.00	0.00	0.00	0.00	0.00							
12 Hr. Employees**	2027	LD11	Aggregate	78	28,470	461,214	1,264	0.03	1.74	0.20	0.13	0.05	0.01	1400.16	0.03	0.04	0.01	0.34	0.04	0.02	0.01	0.00	0.00	0.00	0.00							
9/80 Employees**	2027	LD11	Aggregate	237	86,505	1,401,381	3,839	0.10	5.30	0.61	0.39	0.16	0.02	1945.70	0.09	0.13	0.02	0.97	0.11	0.07	0.03	0.00	0.00	0.00	0.00							
							Total	0.68	10.02	16.03	1.30	0.54	0.13	13760.78	0.15	0.21	0.06	1.47	1.10	0.14	0.06	0.01	0.00	0.00	0.00	0.00						
Miscellaneous Trips	2028	T7 Single	Aggregate	7	803	324,102	2,821	0.46	2.54	12.19	0.66	0.27	0.09	9544.46	0.03	0.03	0.03	0.15	0.70	0.04	0.02	0.01	0.00	0.00	0.00							
Miscellaneous Truck Deliveries**	2028	T7 Single	Aggregate	10	1134	98,545	869	0.14	0.78	3.25	0.21	0.09	0.03	2940.14	0.01	0.01	0.01	0.05	0.20	0.01	0.00	0.00	0.00	0.00	0.00							
12 Hr. Employees**	2028	LD11	Aggregate	78	28,470	461,214	1,264	0.03	1.60	0.18	0.13	0.05	0.01	619.96	0.03	0.04	0.01	0.29	0.03	0.02	0.01	0.00	0.00	0.00	0.00							
9/80 Employees**	2028	LD11	Aggregate	237	86,505	1,401,381	3,839	0.09	4.87	0.55	0.39	0.16	0.02	1883.71	0.09	0.13	0.02	0.89	0.10	0.07	0.03	0.00	0.00	0.00	0.00							
							Total	0.73	9.80	16.67	1.39	0.57	0.14	14988.28	0.15	0.22	0.06	1.37	1.05	0.14	0.06	0.01	0.00	0.00	0.00	0.00						
Miscellaneous Trips	2029	T7 Single	Aggregate	7	831	332,332	2,800	0.45	2.32	11.36	0.67	0.28	0.09	9256.58	0.03	0.03	0.03	0.15	0.70	0.04	0.02	0.01	0.00	0.00	0.00							
Miscellaneous Truck Deliveries**	2029	T7 Single	Aggregate	10	1134	98,545	869	0.14	0.78	3.53	0.20	0.08	0.03	2926.66	0.01	0.01	0.01	0.04	0.20	0.01	0.00	0.00	0.00	0.00	0.00							
12 Hr. Employees**	2029	LD11	Aggregate	78	28,470	461,214	1,264	0.03	1.45	0.16	0.13	0.05	0.01	602.25	0.03	0.04	0.00	0.27	0.03	0.02	0.01	0.00	0.00	0.00	0.00							
9/80 Employees**																																

Source	Region	Calendar Year	Season	Vehicle Class	Fuel	Model Year	Speed	ROC	CO	NOX	PM10	PM2.5	SOX	CO2	N2O*	CH4*
Miscellaneous Truck Deliveries**	2044	T7 Single	Aggregate	10	1134	98,545	869	0.13	0.75	2.15	0.20	0.08	0.03	2817.89	0.01	0.01
12 Hr. Employees**	2044	LD11	Aggregate	78	28470	461,214	1,264	0.01	0.70	0.07	0.13	0.05	0.01	515.08	0.03	0.04
9/80 Employees**	2044	LD11	Aggregate	237	86505	1,401,381	3,839	0.03	2.12	0.20	0.38	0.15	0.02	1565.06	0.09	0.13
Total	0.58	6.02	9.44	1.35	0.53	0.14	14136.43	0.15	0.22	0.44	0.69	0.56	0.14	0.06	0.01	951.52
Miscellaneous Trips	2045	T7 Single	Aggregate	7	755	306,692	2,842	0.42	2.44	6.94	0.64	0.25	0.09	9207.61	0.03	0.03
Miscellaneous Truck Deliveries**	2045	T7 Single	Aggregate	10	1134	98,545	869	0.13	0.75	2.12	0.20	0.08	0.03	2817.89	0.01	0.01
12 Hr. Employees**	2045	LD11	Aggregate	78	28470	461,214	1,264	0.01	0.69	0.06	0.13	0.05	0.01	514.22	0.03	0.04
9/80 Employees**	2045	LD11	Aggregate	237	86505	1,401,381	3,839	0.03	2.11	0.20	0.38	0.15	0.02	1562.45	0.09	0.13
Total	0.58	5.99	9.32	1.35	0.53	0.14	14099.70	0.15	0.22	0.44	0.69	0.54	0.14	0.06	0.01	939.60
Miscellaneous Trips	2046	T7 Single	Aggregate	6	709	290,525	2,454	0.36	2.10	5.93	0.55	0.21	0.08	7925.62	0.03	0.03
Miscellaneous Truck Deliveries**	2046	T7 Single	Aggregate	10	1134	98,545	869	0.13	0.75	2.07	0.20	0.08	0.03	2813.47	0.01	0.01
12 Hr. Employees**	2046	LD11	Aggregate	78	28470	461,214	1,264	0.01	0.69	0.06	0.13	0.05	0.01	513.50	0.03	0.04
9/80 Employees**	2046	LD11	Aggregate	237	86505	1,401,381	3,839	0.03	2.09	0.20	0.38	0.15	0.02	1560.27	0.09	0.13
Total	0.58	4.83	8.28	1.26	0.50	0.14	14069.86	0.14	0.21	0.43	0.68	0.53	0.14	0.06	0.01	931.02
Miscellaneous Trips	2047	T7 Single	Aggregate	6	709	290,525	2,454	0.36	2.11	5.90	0.55	0.21	0.08	7940.44	0.03	0.03
Miscellaneous Truck Deliveries**	2047	T7 Single	Aggregate	10	1134	98,545	869	0.13	0.75	2.09	0.20	0.08	0.03	2811.83	0.01	0.01
12 Hr. Employees**	2047	LD11	Aggregate	78	28470	461,214	1,264	0.01	0.68	0.06	0.13	0.05	0.01	512.81	0.03	0.04
9/80 Employees**	2047	LD11	Aggregate	237	86505	1,401,381	3,839	0.03	2.08	0.20	0.38	0.15	0.02	1558.15	0.09	0.13
Total	0.52	5.62	8.25	1.26	0.50	0.12	12923.23	0.15	0.21	0.43	0.67	0.52	0.14	0.05	0.01	914.16
Miscellaneous Trips	2048	T7 Single	Aggregate	6	693	283,211	2,448	0.36	2.10	5.86	0.55	0.21	0.08	7917.06	0.03	0.03
Miscellaneous Truck Deliveries**	2048	T7 Single	Aggregate	10	1134	98,545	869	0.13	0.75	2.08	0.20	0.08	0.03	2810.43	0.01	0.01
12 Hr. Employees**	2048	LD11	Aggregate	78	28470	461,214	1,264	0.01	0.68	0.06	0.13	0.05	0.01	512.81	0.03	0.04
9/80 Employees**	2048	LD11	Aggregate	237	86505	1,401,381	3,839	0.03	2.09	0.20	0.38	0.15	0.02	1558.15	0.09	0.13
Total	0.52	5.60	8.20	1.26	0.50	0.12	12796.36	0.15	0.21	0.43	0.67	0.50	0.14	0.05	0.01	902.80
Miscellaneous Trips	2049	T7 Single	Aggregate	6	677	278,191	2,466	0.36	2.12	5.88	0.56	0.22	0.08	7971.70	0.03	0.03
Miscellaneous Truck Deliveries**	2049	T7 Single	Aggregate	10	1134	98,545	869	0.13	0.75	2.07	0.20	0.08	0.03	2809.17	0.01	0.01
12 Hr. Employees**	2049	LD11	Aggregate	78	28470	461,214	1,264	0.01	0.68	0.06	0.13	0.05	0.01	511.92	0.03	0.04
9/80 Employees**	2049	LD11	Aggregate	237	86505	1,401,381	3,839	0.03	2.07	0.19	0.38	0.15	0.02	1555.44	0.09	0.13
Total	0.52	5.41	8.21	1.26	0.50	0.12	12848.23	0.15	0.21	0.43	0.67	0.46	0.50	0.14	0.05	0.01
Miscellaneous Trips	2050	T7 Single	Aggregate	6	660	272,127	2,472	0.36	2.12	5.88	0.56	0.22	0.08	7970.88	0.03	0.03
Miscellaneous Truck Deliveries**	2050	T7 Single	Aggregate	10	1134	98,545	869	0.13	0.75	2.07	0.20	0.08	0.03	2809.09	0.01	0.01
12 Hr. Employees**	2050	LD11	Aggregate	78	28470	461,214	1,264	0.01	0.68	0.06	0.13	0.05	0.01	511.66	0.03	0.04
9/80 Employees**	2050	LD11	Aggregate	237	86505	1,401,381	3,839	0.03	2.07	0.19	0.38	0.15	0.02	1554.44	0.09	0.13
Total	0.52	5.41	8.20	1.26	0.50	0.12	12866.28	0.15	0.21	0.43	0.67	0.49	0.13	0.05	0.01	885.85
Miscellaneous Trips	2051	T7 Single	Aggregate	5	547	226,210	2,065	0.30	1.77	4.91	0.46	0.18	0.06	6675.23	0.02	0.02
Miscellaneous Truck Deliveries**	2051	T7 Single	Aggregate	10	1134	98,545	869	0.13	0.75	2.07	0.20	0.08	0.03	2809.09	0.01	0.01
12 Hr. Employees**	2051	LD11	Aggregate	78	28470	461,214	1,264	0.01	0.68	0.06	0.13	0.05	0.01	511.66	0.03	0.04
9/80 Employees**	2051	LD11	Aggregate	237	86505	1,401,381	3,839	0.03	2.07	0.19	0.38	0.15	0.02	1554.45	0.09	0.13
Total	0.46	5.26	7.23	1.17	0.46	0.11	11550.63	0.14	0.21	0.43	0.64	0.43	0.13	0.05	0.01	818.51
Miscellaneous Trips	2052	T7 Single	Aggregate	4	518	217,037	1,676	0.24	1.44	3.99	0.38	0.15	0.05	5417.77	0.02	0.02
Miscellaneous Truck Deliveries**	2052	T7 Single	Aggregate	10	1134	98,545	869	0.13	0.75	2.07	0.20	0.08	0.03	2809.09	0.01	0.01
12 Hr. Employees**	2052	LD11	Aggregate	78	28470	461,214	1,264	0.01	0.68	0.06	0.13	0.05	0.01	511.66	0.03	0.04
9/80 Employees**	2052	LD11	Aggregate	237	86505	1,401,381	3,839	0.03	2.07	0.19	0.38	0.15	0.02	1554.45	0.09	0.13
Total	0.41	4.93	6.31	1.08	0.43	0.10	10293.16	0.14	0.21	0.43	0.64	0.42	0.13	0.05	0.01	805.05

**Trips Counts did not change from year to year

Source	Region	Calendar Year	Season	Vehicle Class	Fuel	Model Year	Speed	Running															
								ROC	CO	NOX	PM10	PM2.5	SOX	CO2	N2O*	CH4*							
EMFAC2014	Santa Barbara County	2021	Annual Average	T7 Single	DSL	Aggregate	Aggregate	0.109141	0.740254	4.907384	0.245139	0.0614	0.015654	246.851415	0.0048	0.0051							
EMFAC2014	Santa Barbara County	2021	Annual Average	LD11	Gas	Aggregate	Aggregate	0.0255052	1.154666	0.130493	0.046696	0.019539	0.002954	293.9905879	0.0101	0.0157							
EMFAC2014	Santa Barbara County	2022	Annual Average	T7 Single	DSL	Aggregate	Aggregate	0.1051088	0.642605	4.342103	0.120816	0.057538	0.015473	1621.847021	0.0048	0.0051							
EMFAC2014	Santa Barbara County	2022	Annual Average	LD11	Gas	Aggregate	Aggregate	0.0224845	1.017943	0.120919	0.046612	0.014481	0.002845	281.266169	0.0101	0.0157							
EMFAC2014	Santa Barbara County	2023	Annual Average	T7 Single	DSL	Aggregate	Aggregate	0.0812015	0.628749	4.89152	0.1261	0.046921	0.01508	1506.68861	0.0048	0.0051							
EMFAC2014	Santa Barbara County	2023	Annual Average	LD11	Gas	Aggregate	Aggregate	0.0199349	0.938577	0.10853	0.046683	0.019436	0.002712	272.1746305	0.0101	0.0157							
EMFAC2014	Santa Barbara County	2024	Annual Average	T7 Single	DSL	Aggregate	Aggregate	0.0793749	0.418489	2.622263	0.117093	0.048121	0.014975	1569.668812	0.0048	0.0051							
EMFAC2014	Santa Barbara County	2024	Annual Average	LD11	Gas	Aggregate	Aggregate	0.0170617	0.97392	0.095392	0.046339	0.002619	0.002619	260.925091	0.0101	0.0157							
EMFAC2014	Santa Barbara County	2025	Annual Average	T7 Single	DSL	Aggregate	Aggregate	0.077885	0.415989	1.445511	0.109623	0.048423	0.014581	1500.676917	0.0048	0.0051							
EMFAC2014	Santa Barbara County	2025	Annual Average	LD11	Gas	Aggregate	Aggregate	0.0156101	0.769569	0.087434	0.046491	0.01935	0.002506	249.756045	0.0101	0.0157							
EMFAC2014	Santa Barbara County	2026	Annual Average	T7 Single	DSL	Aggregate	Aggregate	0.0764697	0.413351	2.264896	0.108431	0.045688	0.014795	1550.81095	0.0048	0.0051							
EMFAC2014	Santa Barbara County	2026	Annual Average	LD11	Gas	Aggregate	Aggregate	0.0139284	0.648954	0.078942	0.046288	0.002295	0.002295	236.3168815	0.0101	0.0157							
EMFAC2014	Santa Barbara County	2027	Annual Average	T7 Single	DSL	Aggregate	Aggregate	0.0751427	0.410784	1.10087	0.104683	0.044312	0.014348	1546.66881	0.0048	0.0051							
EMFAC2014	Santa Barbara County	2027	Annual Average	LD11	Gas	Aggregate	Aggregate	0.0121065	0.62613	0.071649	0.046194	0.019174	0.002305	229.8679351	0.0101	0.0157							
EMFAC2014	Santa Barbara County	2028	Annual Average	T7 Single	DSL	Aggregate	Aggregate	0.0740744	0.40917	1.959561	0.106514	0.044854	0.014641	1534.665984	0.0048	0.0051							
EMFAC2014	Santa Barbara County	2028	Annual Average	LD11	Gas	Aggregate	Aggregate	0.009912	0.64879	0.064872	0.046176	0.002213	0.002213	222.546689	0.0101	0.0157							
EMFAC2014	Santa Barbara County	2029	Annual Average	T7 Single	DSL	Aggregate	Aggregate	0.073108	0.407483	1.840517	0.105802	0.043173	0.014574	1527.632921	0.0048	0.0051							
EMFAC2014	Santa Barbara County																						

Operating Tankers Emissions

CNG Vehicle Fleet Mix

Process	Calendar Year	Vehicle Class	Model Year	Peak Daily Trips	Average Daily Trip	# Trips per Year	Annual miles	Daily Miles	Daily Emissions										Annual Emissions							
									ROC (lbs/day)	CO (lbs/day)	NOX (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	SOX (lbs/day)	CO2 (lbs/day)	N2O (lbs/day)	CH4 (lbs/day)	ROC (tons/yr)	CO (tons/yr)	NOX (tons/yr)	PM10 (tons/yr)	PM2.5 (tons/yr)	SOX (tons/yr)	CO2 (tonnes/yr)	N2O (tonne/yr)	CH4 (tonne/yr)
Tanker Trips	2021	T7 Single	2017-2019	52	51.0	18607	2,612,423	7,301	1.37	1814.40	2.34	1.17	1.17	0.22	32560.03	0.08	0.08	0.24	324.62	0.42	0.21	0.21	0.04	3825.05	0.01	0.01
Tanker Trips	2022	T7 Single	2018-2020	72	70.8	25832	3,626,813	10,109	1.89	2512.25	3.24	1.62	1.62	0.31	32621.57	0.11	0.11	0.34	450.67	0.58	0.29	0.29	0.06	5310.30	0.02	0.02
Tanker Trips	2023	T7 Single	2019-2021	82	81.9	29889	4,196,416	11,513	2.15	2861.17	3.69	1.85	1.85	0.35	37152.35	0.12	0.13	0.39	521.45	0.67	0.34	0.34	0.07	6144.30	0.02	0.02
Tanker Trips	2024	T7 Single	2020-2022	84	82.7	30183	4,237,693	11,794	2.21	2930.96	3.78	1.89	1.89	0.36	38058.50	0.12	0.13	0.40	526.58	0.68	0.34	0.34	0.07	6204.73	0.02	0.02
Tanker Trips	2025	T7 Single	2021-2023	88	86.5	31568	4,432,147	12,355	2.31	3070.53	3.96	1.98	1.98	0.38	39870.81	0.13	0.14	0.41	550.74	0.71	0.36	0.36	0.07	6489.45	0.02	0.02
Tanker Trips	2026	T7 Single	2022-2024	136	134.1	48946	6,872,018	19,094	3.57	4745.36	6.12	3.06	3.06	0.59	61638.53	0.20	0.21	0.64	853.92	1.10	0.55	0.55	0.11	10061.85	0.03	0.04
Tanker Trips	2027	T7 Single	2023-2025	158	156.1	56978	7,999,711	22,183	4.15	5521.99	7.11	3.56	3.56	0.68	71586.23	0.23	0.25	0.75	994.05	1.28	0.64	0.64	0.12	12723.79	0.04	0.04
Tanker Trips	2028	T7 Single	2024-2026	170	169.6	61895	8,690,058	23,868	4.46	5931.70	7.65	3.83	3.83	0.73	77023.16	0.25	0.27	0.81	1079.83	1.39	0.70	0.70	0.13	12723.79	0.04	0.04
Tanker Trips	2029	T7 Single	2025-2027	174	173.9	63473	8,911,609	24,430	4.57	6071.27	7.83	3.92	3.92	0.75	78835.47	0.26	0.27	0.83	1107.36	1.43	0.71	0.71	0.14	13048.18	0.04	0.05
Tanker Trips	2030	T7 Single	2026-2028	186	184.8	67443	9,466,997	26,114	4.88	6489.98	8.37	4.19	4.19	0.80	84272.40	0.28	0.29	0.89	1176.62	1.52	0.76	0.76	0.15	13864.29	0.05	0.05
Tanker Trips	2031	T7 Single	2027-2029	190	188.1	68642	9,637,537	26,676	4.99	6629.55	8.55	4.28	4.28	0.82	86064.71	0.28	0.30	0.90	1197.54	1.55	0.77	0.77	0.15	14110.77	0.05	0.05
Tanker Trips	2032	T7 Single	2028-2030	186	185.4	67684	9,502,834	26,114	4.88	6489.98	8.37	4.19	4.19	0.80	84272.40	0.28	0.29	0.89	1180.83	1.52	0.76	0.76	0.15	13913.84	0.05	0.05
Tanker Trips	2033	T7 Single	2029-2031	176	175.5	64051	8,992,760	24,710	4.62	6141.06	7.92	3.96	3.96	0.76	79741.63	0.26	0.28	0.84	1117.45	1.44	0.72	0.72	0.14	13167.00	0.04	0.05
Tanker Trips	2034	T7 Single	2030-2032	172	170.8	62343	8,752,957	24,149	4.52	6001.49	7.74	3.87	3.87	0.74	77929.32	0.26	0.27	0.82	1087.65	1.40	0.70	0.70	0.13	12815.88	0.04	0.04
Tanker Trips	2035	T7 Single	2031-2033	172	171.5	62586	8,787,074	24,149	4.52	6001.49	7.74	3.87	3.87	0.74	77929.32	0.26	0.27	0.82	1091.89	1.41	0.70	0.70	0.14	12865.84	0.04	0.04
Tanker Trips	2036	T7 Single	2032-2034	172	171.2	62502	8,775,281	24,149	4.52	6001.49	7.74	3.87	3.87	0.74	77929.32	0.26	0.27	0.82	1090.42	1.41	0.70	0.70	0.14	12848.57	0.04	0.04
Tanker Trips	2037	T7 Single	2033-2035	174	172.0	62794	8,816,278	24,430	4.57	6071.27	7.83	3.92	3.92	0.75	78835.47	0.26	0.27	0.82	1095.52	1.41	0.71	0.71	0.14	12908.60	0.04	0.04
Tanker Trips	2038	T7 Single	2034-2036	178	176.3	64350	9,034,740	24,991	4.67	6210.84	8.01	4.01	4.01	0.77	80647.78	0.26	0.28	0.85	1122.66	1.45	0.72	0.72	0.14	13228.46	0.04	0.05
Tanker Trips	2039	T7 Single	2035-2037	176	174.1	63544	8,921,578	24,710	4.62	6141.06	7.92	3.96	3.96	0.76	79741.63	0.26	0.28	0.83	1108.60	1.43	0.72	0.72	0.14	13062.77	0.04	0.05
Tanker Trips	2040	T7 Single	2036-2038	168	166.2	60669	8,517,928	23,587	4.41	5861.92	7.56	3.78	3.78	0.73	76117.01	0.25	0.27	0.80	1058.44	1.37	0.68	0.68	0.13	12471.76	0.04	0.04
Tanker Trips	2041	T7 Single	2037-2039	162	161.1	58787	8,253,695	22,745	4.25	5652.56	7.29	3.65	3.65	0.70	73398.54	0.24	0.26	0.77	1025.61	1.32	0.66	0.66	0.13	12084.87	0.04	0.04
Tanker Trips	2042	T7 Single	2038-2040	156	156.0	56925	7,992,270	21,902	4.10	5443.21	7.02	3.51	3.51	0.67	70680.08	0.23	0.25	0.75	993.12	1.28	0.64	0.64	0.12	11702.10	0.04	0.04
Tanker Trips	2043	T7 Single	2039-2041	152	151.6	55321	7,767,068	21,341	3.99	5303.64	6.84	3.42	3.42	0.66	68867.77	0.23	0.24	0.73	965.14	1.25	0.62	0.62	0.12	11372.37	0.04	0.04
Tanker Trips	2044	T7 Single	2040-2042	148	147.2	53737	7,544,675	20,779	3.89	5164.07	6.66	3.33	3.33	0.64	67055.46	0.22	0.23	0.71	937.51	1.21	0.60	0.60	0.12	11046.74	0.04	0.04
Tanker Trips	2045	T7 Single	2041-2043	142	141.6	51681	7,256,012	19,937	3.73	4954.72	6.39	3.20	3.20	0.61	64336.99	0.21	0.22	0.68	901.64	1.16	0.58	0.58	0.11	10624.09	0.03	0.04
Tanker Trips	2046	T7 Single	2042-2044	138	137.0	50021	7,022,948	19,375	3.62	4815.15	6.21	3.11	3.11	0.60	62524.68	0.21	0.22	0.66	872.68	1.13	0.56	0.56	0.11	10282.84	0.03	0.04
Tanker Trips	2047	T7 Single	2043-2045	134	132.9	48114	6,811,366	18,814	3.52	4675.58	6.03	3.02	3.02	0.58	60712.37	0.20	0.21	0.64	846.38	1.09	0.55	0.55	0.10	9973.05	0.03	0.03
Tanker Trips	2048	T7 Single	2044-2046	130	128.0	46722	6,559,769	18,252	3.41	4536.01	5.85	2.93	2.93	0.56	58900.07	0.19	0.21	0.61	815.12	1.05	0.53	0.53	0.10	9604.67	0.03	0.03
Tanker Trips	2049	T7 Single	2045-2047	124	123.2	44979	6,315,052	17,410	3.26	4326.65	5.58	2.79	2.79	0.54	56181.60	0.18	0.20	0.59	784.71	1.01	0.51	0.51	0.10	9246.36	0.03	0.03
Tanker Trips	2050	T7 Single	2046-2048	118	117.7	42972	6,033,269	16,567	3.10	4117.30	5.31	2.66	2.66	0.51	53463.14	0.18	0.19	0.56	749.70	0.97	0.48	0.48	0.09	8833.78	0.03	0.03
Tanker Trips	2051	T7 Single	2047-2049	102	100.8	36797	5,166,299	14,321	2.68	3559.02	4.59	2.30	2.30	0.44	46213.90	0.15	0.16	0.48	641.97	0.83	0.41	0.41	0.08	7564.38	0.02	0.03
Tanker Trips	2052	T7 Single	2048-2050	98	96.4	35186	4,940,114	13,759	2.57	3419.45	4.41	2.21	2.21	0.42	44401.59	0.15	0.15	0.46	613.86	0.79	0.40	0.40	0.08	7233.20	0.02	0.03

CNG Tankers		Running												
Source	Engine Year	Vehicle Class	HP	Fuel	Avg Speed	ROC	CO	NOX	PM10	PM2.5	SOX**	CO2**	N2O*	CH4*
Cummins	2017	T7 Single	400	CNG	55	0.0848	112.7273	0.1455	0.0727	0.0727	0.0140	1463.7641	0.0048	0.0051

CNG Emission Factors				
ROC	CO	NOX	PM10	PM2.5
g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr
0.012	15.5	0.02	0.01	0.01

*CCAR General Reporting Protocol Version 3.1 January 2009

**Cummins did not provide emission factors for SOx or CO2, therefore, emission factors obtained from EMFAC2014 for Trucks 3 years or newer were used.

O&M Mobile On-Road Type Vehicle Emissions

On-Site		Daily Emissions											Annual Emissions											
Process	Calendar Year	Vehicle Class	Speed (MPH)	Model Year	Annual miles	Daily Miles	ROC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	N2O (lbs/day)	CH4 (lbs/day)	ROC (tons/yr)	CO (tons/yr)	NOx (tons/yr)	PM10 (tons/yr)	PM2.5 (tons/yr)	SOx (tons/yr)	CO2 (tonne/yr)	N2O (tonne/yr)	CH4 (tonne/yr)
Maintenance Contractor Supervisor (F-250)	2021	LHD01	15	2010	10,400	40	0.03	0.14	0.04	2.4E-03	2.5E-03	5.0E-04	63.14	4.2E-04	4.5E-04	3.4E-03	1.8E-02	5.7E-03	3.3E-04	3.2E-04	6.5E-05	8.2E+00	5.5E-05	5.8E-05
Chemical Support Technician (F-250)	2021	LHD01	15	2010	15,600	60	0.04	0.21	0.07	3.9E-03	3.7E-03	7.5E-04	94.71	6.3E-04	6.7E-04	5.1E-03	2.8E-02	8.6E-03	5.0E-04	4.8E-04	9.8E-05	1.2E+01	8.3E-05	8.8E-05
FI Capital Supervisor (F-250)	2021	LHD01	15	2010	5,200	20	0.01	0.07	0.02	1.3E-03	1.2E-03	2.5E-04	31.57	2.1E-04	2.2E-04	1.7E-03	9.2E-03	2.9E-03	1.7E-04	1.6E-04	3.3E-05	4.1E+00	2.8E-05	2.9E-05
Well servicing Tool Pusher (F-250)	2021	LHD01	15	2010	14,560	40	0.03	0.14	0.04	2.4E-03	2.5E-03	5.0E-04	63.14	4.2E-04	4.5E-04	4.7E-03	2.6E-02	8.0E-03	4.7E-04	4.5E-04	9.1E-05	1.1E+01	7.7E-05	8.2E-05
B&B Supervisor (F-250)	2021	LHD01	15	2010	2,912	40	0.03	0.14	0.04	2.4E-03	2.5E-03	5.0E-04	63.14	4.2E-04	4.5E-04	5.1E-03	1.6E-03	9.4E-05	1.6E-03	1.6E-03	9.0E-05	2.3E+00	1.5E-05	1.6E-05
CLAM Maintenance - Welder Truck (F-250)	2021	LHD01	15	2010	5,200	20	0.01	0.07	0.02	1.3E-03	1.2E-03	2.5E-04	31.57	2.1E-04	2.2E-04	1.7E-03	9.2E-03	2.9E-03	1.7E-04	1.6E-04	3.3E-05	4.1E+00	2.8E-05	2.9E-05
FI Capital - Welder Truck (F-250)	2021	LHD01	15	2010	5,200	20	0.01	0.07	0.02	1.3E-03	1.2E-03	2.5E-04	31.57	2.1E-04	2.2E-04	1.7E-03	9.2E-03	2.9E-03	1.7E-04	1.6E-04	3.3E-05	4.1E+00	2.8E-05	2.9E-05
Plant Maintenance - Welder Truck (F-250)	2021	LHD01	15	2010	5,200	20	0.01	0.07	0.02	1.3E-03	1.2E-03	2.5E-04	31.57	2.1E-04	2.2E-04	1.7E-03	9.2E-03	2.9E-03	1.7E-04	1.6E-04	3.3E-05	4.1E+00	2.8E-05	2.9E-05
Pumping Unit Crew -Support (Gang Truck - F-450)	2021	LHD02	15	2010	5,200	20	0.01	0.07	0.02	1.3E-03	1.2E-03	2.8E-04	35.88	2.1E-04	2.2E-04	1.7E-03	9.2E-03	2.9E-03	1.7E-04	1.6E-04	3.7E-05	4.7E+00	2.8E-05	2.9E-05
Tank cleaning Crew (Gang Truck - F-450)	2021	LHD02	15	2010	280	10	0.01	0.04	0.01	6.4E-04	6.1E-04	1.4E-04	17.94	1.1E-04	1.1E-04	9.1E-05	4.9E-04	1.5E-04	9.0E-06	8.6E-06	2.0E-06	2.5E-01	1.5E-06	1.6E-06
Electrical Maintenance Crew (F-450)	2021	LHD02	15	2010	10,400	40	0.03	0.14	0.04	2.4E-03	2.5E-03	5.0E-04	71.76	4.2E-04	4.5E-04	1.8E-02	5.7E-03	1.3E-04	3.2E-04	7.3E-05	9.3E-05	5.5E-05	5.8E-05	
Chemical Delivery (F-450)	2021	LHD02	15	2010	4,160	80	0.05	0.28	0.09	5.1E-03	4.9E-03	1.1E-03	143.51	8.5E-04	9.0E-04	1.4E-03	7.4E-03	2.3E-03	1.3E-04	1.3E-04	2.9E-05	3.7E+00	2.2E-05	2.3E-05
FI Capital E&I Crew (F-450)	2021	LHD02	15	2010	5,200	20	0.01	0.07	0.02	1.3E-03	1.2E-03	2.8E-04	35.88	2.1E-04	2.2E-04	1.7E-03	9.2E-03	2.9E-03	1.7E-04	1.6E-04	3.7E-05	4.7E+00	2.8E-05	2.9E-05
M&R Crew (Gang Truck - F-450)	2021	LHD02	15	2010	3,456	20	0.01	0.07	0.02	1.3E-03	1.2E-03	2.8E-04	35.88	2.1E-04	2.2E-04	1.7E-03	9.2E-03	2.9E-03	1.7E-04	1.6E-04	4.7E-05	1.0E+01	7.7E-06	8.2E-06
Chemical Sheet Truck (F-450)	2021	LHD02	15	2010	1,960	20	0.01	0.07	0.02	1.3E-03	1.2E-03	2.8E-04	35.88	2.1E-04	2.2E-04	1.8E-03	5.7E-04	1.3E-05	1.3E-05	3.2E-06	7.3E-06	9.3E-01	5.5E-06	5.8E-06
Well servicing Crew (Gang Truck - F-450)	2021	LHD02	15	2010	7,280	20	0.01	0.07	0.02	1.3E-03	1.2E-03	2.8E-04	35.88	2.1E-04	2.2E-04	2.4E-03	1.3E-02	4.0E-03	2.3E-04	2.2E-04	5.1E-05	6.5E+00	3.9E-05	4.1E-05
SUM TOTAL On-Road Type Vehicles	2021	LHD01&LHD02	15	2010			0.32	1.73	0.54	0.03	0.01	0.01	823.05	5.19E-03	5.51E-03	3.24E-02	1.76E-01	5.46E-02	3.19E-03	3.05E-03	6.49E-04	8.21E+01	5.25E-04	5.58E-04

EMFAC2014		Running												
Source (Region)	Calendar Year	Vehicle Class	Fuel	Model Year	Speed	ROC (g/mile)	CO (g/mile)	NOx (g/mile)	PM10 (g/mile)	PM2.5 (g/mile)	SOx** (g/mile)	CO2 (g/mile)	N2O* (g/mile)	CH4* (g/mile)
EMFAC2014 (Santa Barbara County)	2021	LHD01	D5L	2010	15	0.29568	1.603765	0.498665	0.029157	0.027896	0.005686	716.0032	0.0048	0.0051
EMFAC2014 (Santa Barbara County)	2021	LHD02	D5L	2010	15	0.29568	1.603765	0.498665	0.029157	0.027896	0.006379	815.78009	0.0048	0.0051

*CCAR General Reporting Protocol Version 3.1 January 2009
 **SOx emission factors based on aggregate speed since EMFAC2014 will not give emission factors for individual speeds

O&M Mobile Off-Road Equipment Emissions

Year	Emissions (lb/day)					Emissions (tons/year)					Emissions (MT/year)					
	ROC	CO	NOx	SOx	PM10	PM2.5	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
2021	4.26	29.45	44.39	0.11	1.57	1.47	0.78	5.37	8.10	0.02	0.29	0.27	0.00	0.38	1,702.61	1,710.65
2022	3.84	27.59	36.89	0.11	1.33	1.24	0.70	5.03	6.73	0.02	0.24	0.23	0.00	0.38	1,704.52	1,712.55
2023	3.65	26.70	33.17	0.11	1.20	1.12	0.67	4.87	6.05	0.02	0.22	0.21	0.00	0.38	1,705.77	1,717.79
2024	3.54	26.46	30.71	0.11	1.11	1.04	0.65	4.83	5.60	0.02	0.20	0.19	0.00	0.38	1,711.46	1,719.50
2025	4.50	34.18	36.16	0.15	1.25	1.18	0.82	6.24	6.60	0.03	0.23	0.22	0.00	0.47	2,412.54	2,422.44
2026	4.50	34.18	36.16	0.15	1.25	1.18	0.82	6.24	6.60	0.03	0.23	0.22	0.00	0.47	2,412.54	2,422.44
2027	4.50	34.18	36.16	0.15	1.25	1.18	0.82	6.24	6.60	0.03	0.23	0.22	0.00	0.47	2,412.54	2,422.44
2028	4.50	34.18	36.16	0.15	1.25	1.18	0.82	6.24	6.60	0.03	0.23	0.22	0.00	0.47	2,412.54	2,422.44
2029	4.50	34.18	36.16	0.15	1.25	1.18	0.82	6.24	6.60	0.03	0.23	0.22	0.00	0.47	2,412.54	2,422.44
2030	4.27	29.75	13.55	0.16	0.46	0.46	0.78	5.43	2.47	0.03	0.08	0.08	0.00	0.06	2,685.44	2,686.72
2031	4.27	29.75	13.55	0.16	0.46	0.46	0.78	5.43	2.47	0.03	0.08	0.08	0.00	0.06	2,685.44	2,686.72
2032	4.27	29.75	13.55	0.16	0.46	0.46	0.78	5.43	2.47	0.03	0.08	0.08	0.00	0.06	2,685.44	2,686.72
2033	4.27	29.75	13.55	0.16	0.46	0.46	0.78	5.43	2.47	0.03	0.08	0.08	0.00	0.06	2,685.44	2,686.72
2034	4.27	29.75	13.55	0.16	0.46	0.46	0.78	5.43	2.47	0.03	0.08	0.08	0.00	0.06	2,685.44	2,686.72
2035	4.04	29.74	10.39	0.16	0.36	0.36	0.74	5.43	1.90	0.03	0.07	0.07	0.00	0.06	2,685.44	2,686.66
2036	4.04	29.74	10.39	0.16	0.36	0.36	0.74	5.43	1.90	0.03	0.07	0.07	0.00	0.06	2,685.44	2,686.66
2037	4.04	29.74	10.39	0.16	0.36	0.36	0.74	5.43	1.90	0.03	0.07	0.07	0.00	0.06	2,685.44	2,686.66
2038	4.04	29.74	10.39	0.16	0.36	0.36	0.74	5.43	1.90	0.03	0.07	0.07	0.00	0.06	2,685.44	2,686.66
2039	4.04	29.74	10.39	0.16	0.36	0.36	0.74	5.43	1.90	0.03	0.07	0.07	0.00	0.06	2,685.44	2,686.66
2040	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2041	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2042	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2043	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2044	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2045	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2046	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2047	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2048	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2049	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2050	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2051	3.96	29.74	9.30	0.16	0.33	0.33	0.72	5.43	1.70	0.03	0.06	0.06	0.00	0.06	2,685.44	2,686.65
2052	3.96</															

O&M Mobile Off-Road Equipment Emissions

Mitigated - Tier 4 Final Engines

On-Site

Year	Emissions (lb/day)						Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
2021	1.21	44.45	5.25	0.11	0.16	0.16	0.22	8.11	0.96	0.02	0.03	0.03	0.00	0.38	1,702.61	1,710.65
2022	1.21	44.45	5.25	0.11	0.16	0.16	0.22	8.11	0.96	0.02	0.03	0.03	0.00	0.38	1,704.52	1,712.55
2023	1.21	44.45	5.25	0.11	0.16	0.16	0.22	8.11	0.96	0.02	0.03	0.03	0.00	0.38	1,705.77	1,713.79
2024	1.21	44.45	5.25	0.11	0.16	0.16	0.22	8.11	0.96	0.02	0.03	0.03	0.00	0.38	1,711.45	1,715.50
2025	1.21	44.45	5.25	0.11	0.16	0.16	0.22	8.11	0.96	0.02	0.03	0.03	0.00	0.47	2,412.53	2,422.44
2026	1.21	44.45	5.25	0.11	0.16	0.16	0.22	8.11	0.96	0.02	0.03	0.03	0.00	0.47	2,412.53	2,422.44
2027	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.47	2,412.53	2,422.44
2028	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.47	2,419.14	2,425.07
2029	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.47	2,412.53	2,422.44
2030	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.71
2031	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.71
2032	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,692.79	2,694.07
2033	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.71
2034	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.71
2035	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.66
2036	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,692.79	2,694.02
2037	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.66
2038	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.66
2039	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.66
2040	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,692.79	2,694.01
2041	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.65
2042	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.65
2043	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.65
2044	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,692.79	2,694.01
2045	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.65
2046	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.65
2047	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.65
2048	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,692.79	2,694.01
2049	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.65
2050	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.65
2051	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,685.44	2,686.65
2052	1.69	62.14	7.34	0.15	0.23	0.23	0.31	11.34	1.34	0.03	0.04	0.04	0.00	0.06	2,692.79	2,694.01

1. Emissions calculated using the CalEEMod v2013.2.2 Program

2. Equipment size and use based on Applicant submittal

3. Tier 4 Final construction equipment was used to mitigate the construction emissions.

AERA - Santa Barbara County - Cat Canyon - ECC Project

Operational Unpaved Fugitive Dust Emission Calculations

Unmitigated

Year	Activity/Source	Max Source	Source Units	Average Source	Source Units	Emissions Factor	lbs/Day		Tons/Year	
							PM10	PM2.5	PM10	PM2.5
2021	O&M Unpaved Travel	80.0	miles/day	29,120.00	miles/year	CalEEMod	117.77	11.76	19.314	1.928

1. Unpaved road traveled emissions were calculated using CalEEMod which used the following methodology.

$$EF = \{ [[k \times (s/12)^1 \times (S/30)^{0.5}] / [(M/0.5)^{0.2}] - C \} \times [1 - (P/365)]$$

Where,

EF = emission factor

k = particle size multiplier

s = surface material silt content (%)

M = surface material moisture content (%)

S = mean vehicle speed (mph)

C = emissions factor for 1980's vehicle fleet exhaust, brake wear and tire wear

P = number of days in a year with at least 0.254 mm of precipitation

Then,

$$E = EF \times VMT$$

Where,

E = emissions

EF = emission factor

VMT = unpaved vehicle miles traveled

Mitigated

Year	Activity/Source	Max Source	Source Units	Average Source	Source Units	Emissions Factor	lbs/Day		Tons/Year	
							PM10	PM2.5	PM10	PM2.5
2021	O&M Unpaved Travel	80.0	miles/day	29,120.00	miles/year	CalEEMod	5.63	0.56	0.924	0.093

1. Unpaved road traveled emissions were calculated using CalEEMod which used the following methodology.

$$EF = \{ [[k \times (s/12)^1 \times (S/30)^{0.5}] / [(M/0.5)^{0.2}] - C \} \times [1 - (P/365)]$$

Where,

EF = emission factor

k = particle size multiplier

s = surface material silt content (%)

M = surface material moisture content (%)

S = mean vehicle speed (mph)

C = emissions factor for 1980's vehicle fleet exhaust, brake wear and tire wear

P = number of days in a year with at least 0.254 mm of precipitation

Then,

$$E = EF \times VMT$$

Where,

E = emissions

EF = emission factor

VMT = unpaved vehicle miles traveled

2. Mitigation selected in CalEEMod were using soil stabilizers (80% reduction for applying soil binders once a month per AP-42), and reduce vehicle speed to less than 15 mph.

3. CalEEMod does not give mitigation credit for water to unpaved road travel since the model thinks it is offsite travel, therefore, a 61% reduction (CalEEMod default factor) of the unpaved road travel fugitive dust emissions was taken manually to account for the onsite unpaved roads being watered 3 times daily.

Operating Paved Road Travel Emissions

Trip Type	Calendar Year	Empty Tanker Trips per Day	Full Tanker Trips per Day	Total Tanker Trips per Day	Misc Trips per Day	Misc Truck Delivery Trips per Day	9/80 Employee Trips per Day	12 HR Employee Trips per Day	Total Trips per Day	Tanker Paved miles per trip	Misc Trips Paved miles per trip	Misc Truck Delivery Paved miles per trip	Employee Paved miles per trip	Average Paved Trip Distance (miles)	PM10 k (lb/VMT)	PM2.5 k (lb/VMT)	sL (g/m ²)	W (tons)	Daily Emissions	
																			PM10 (lbs/day)	PM2.5 (lbs/day)
Total	2021	21	31	52	0	2	24	39	117	139.93	0	86.43	15.66	72.10	0.0022	0.00054	0.03	11.58	9.28	2.28
Total	2022	30	42	72	0	2	24	39	137	139.93	0	86.43	15.66	82.00	0.0022	0.00054	0.03	13.23	14.16	3.48
Total	2023	32	50	82	3	6	143	47	281	139.93	610.53	86.43	15.66	59.79	0.0022	0.00054	0.03	8.43	13.37	3.28
Total	2024	33	51	84	4	10	237	78	413	139.93	609.53	86.43	15.66	48.40	0.0022	0.00054	0.03	6.45	12.11	2.97
Total	2025	35	53	88	4	10	237	78	417	139.93	608.11	86.43	15.66	49.26	0.0022	0.00054	0.03	6.60	12.74	3.13
Total	2026	54	82	136	5	10	237	78	466	139.93	404.85	86.43	15.66	57.62	0.0022	0.00054	0.03	8.39	21.28	5.22
Total	2027	62	96	158	6	10	237	78	489	139.93	402.37	86.43	15.66	62.00	0.0022	0.00054	0.03	9.13	26.17	6.42
Total	2028	67	103	170	7	10	237	78	502	139.93	402.82	86.43	15.66	64.55	0.0022	0.00054	0.03	9.48	29.07	7.14
Total	2029	68	106	174	7	10	237	78	506	139.93	399.44	86.43	15.66	65.10	0.0022	0.00054	0.03	9.61	29.98	7.36
Total	2030	73	113	186	7	10	237	78	518	139.93	400.22	86.43	15.66	66.84	0.0022	0.00054	0.03	9.93	32.59	8.00
Total	2031	74	116	190	8	10	237	78	523	139.93	400.25	86.43	15.66	68.04	0.0022	0.00054	0.03	10.07	33.95	8.33
Total	2032	72	114	186	7	10	237	78	518	139.93	400.68	86.43	15.66	66.85	0.0022	0.00054	0.03	9.97	32.71	8.03
Total	2033	68	108	176	7	10	237	78	508	139.93	400.22	86.43	15.66	65.41	0.0022	0.00054	0.03	9.70	30.51	7.49
Total	2034	67	105	172	7	10	237	78	504	139.93	400.80	86.43	15.66	64.82	0.0022	0.00054	0.03	9.56	29.58	7.26
Total	2035	67	105	172	7	10	237	78	504	139.93	402.42	86.43	15.66	64.85	0.0022	0.00054	0.03	9.56	29.59	7.26
Total	2036	67	105	172	7	10	237	78	504	139.93	402.64	86.43	15.66	64.85	0.0022	0.00054	0.03	9.56	29.59	7.26
Total	2037	68	106	174	7	10	237	78	506	139.93	404.19	86.43	15.66	65.17	0.0022	0.00054	0.03	9.61	30.01	7.37
Total	2038	69	109	178	7	10	237	78	510	139.93	402.65	86.43	15.66	65.73	0.0022	0.00054	0.03	9.74	30.94	7.59
Total	2039	69	107	176	8	10	237	78	509	139.93	402.84	86.43	15.66	66.11	0.0022	0.00054	0.03	9.67	30.80	7.56
Total	2040	65	103	168	8	10	237	78	501	139.93	403.61	86.43	15.66	64.94	0.0022	0.00054	0.03	9.47	29.16	7.16
Total	2041	63	99	162	8	10	237	78	495	139.93	403.80	86.43	15.66	64.03	0.0022	0.00054	0.03	9.28	27.84	6.83
Total	2042	60	96	156	7	10	237	78	488	139.93	404.59	86.43	15.66	62.41	0.0022	0.00054	0.03	9.12	26.27	6.45
Total	2043	59	93	152	7	10	237	78	484	139.93	403.71	86.43	15.66	61.76	0.0022	0.00054	0.03	8.97	25.36	6.23
Total	2044	57	91	148	7	10	237	78	480	139.93	406.25	86.43	15.66	61.15	0.0022	0.00054	0.03	8.87	24.60	6.04
Total	2045	55	87	142	7	10	237	78	474	139.93	405.25	86.43	15.66	60.14	0.0022	0.00054	0.03	8.66	23.33	5.73
Total	2046	54	84	138	6	10	237	78	469	139.93	407.78	86.43	15.66	58.75	0.0022	0.00054	0.03	8.50	22.12	5.43
Total	2047	52	82	134	6	10	237	78	465	139.93	408.75	86.43	15.66	58.07	0.0022	0.00054	0.03	8.38	21.37	5.25
Total	2048	51	79	130	6	10	237	78	461	139.93	407.66	86.43	15.66	57.34	0.0022	0.00054	0.03	8.23	20.53	5.04
Total	2049	48	76	124	6	10	237	78	455	139.93	410.37	86.43	15.66	56.29	0.0022	0.00054	0.03	8.05	19.44	4.77
Total	2050	46	72	118	6	10	237	78	449	139.93	411.56	86.43	15.66	55.19	0.0022	0.00054	0.03	7.82	18.27	4.48
Total	2051	40	62	102	5	10	237	78	432	139.93	413.01	86.43	15.66	51.24	0.0022	0.00054	0.03	7.20	15.00	3.68
Total	2052	38	60	98	4	10	237	78	427	139.93	418.08	86.43	15.66	49.61	0.0022	0.00054	0.03	7.05	14.04	3.45

Notes:
 1. ADT used for estimating silt load factor was based upon averaging the roadway ADTs for all the roads used for the project. Local road ADTs were taken from the traffic study. Highway ADTs were taken from the 2016 Caltrans Traffic Data. The US 101 ADT was taken as the average from Clark Road to Highway 46. The Highway 46 ADT was taken as the average from Highway 101 to Highway 33. Highway 33 ADT was taken as the average from Highway 46 to the entrance to Belridge facility. The average of all the roadway ADTs was approximately 13,600, which is greater than 10,000, which results in an sL factor of 0.03.
 2. Average Vehicle Weight (W): Average of empty tankers (13 tons), full tankers (31 tons), Misc. trips and Misc. Truck deliveries (13 tons), employee trips (1.5 tons).
 3. PM10 and PM2.5 "k" factors were obtained from AP-42 Table 13.2.1-1

Operating Paved Road Travel Emissions

Trip Type	Calendar Year	Empty Tanker Trips per Year	Full Tanker Trips per Year	Total Tanker Trips per Year	Misc Trips per Year	Misc Truck Delivery Trips per Year	9/80 Employee Trips per Year	12 HR Employee Trips per Year	Total Trips per Year	Tanker Paved miles per trip	Misc Trips Paved miles per trip	Misc Truck Delivery Paved miles per trip	Employee Paved miles per trip	Average Paved Trip Distance (miles)	PM10 k (lb/VMT)	PM2.5 k (lb/VMT)	sL (g/m ²)	W (tons)	Annual Emissions	
																			PM10 (tons/year)	PM2.5 (tons/year)
Total	2021	7809	10798	18607	0	171	8760	14235	41773	139.93	0	86.43	15.66	71.30	0.0022	0.00054	0.03	11.32	1.60	0.39
Total	2022	10840	14992	25832	0	171	8760	14235	48998	139.93	0	86.43	15.66	81.42	0.0022	0.00054	0.03	13.11	2.49	0.61
Total	2023	11858	18031	29889	344	681	52195	17155	100264	139.93	610.53	86.43	15.66	55.23	0.0022	0.00054	0.03	8.28	2.16	0.53
Total	2024	11975	18208	30183	574	1134	86505	28470	146866	139.93	609.53	86.43	15.66	44.07	0.0022	0.00054	0.03	6.23	1.89	0.46
Total	2025	12524	19044	31568	578	1134	86505	28470	148255	139.93	608.11	86.43	15.66	44.97	0.0022	0.00054	0.03	6.39	2.00	0.49
Total	2026	19418	29528	48946	709	1134	86505	28470	165764	139.93	404.85	86.43	15.66	54.50	0.0022	0.00054	0.03	8.23	3.51	0.86
Total	2027	22489	34489	56978	778	1134	86505	28470	173865	139.93	402.37	86.43	15.66	58.58	0.0022	0.00054	0.03	8.97	4.32	1.06
Total	2028	24430	37465	61895	803	1134	86505	28470	178807	139.93	402.82	86.43	15.66	60.86	0.0022	0.00054	0.03	9.38	4.83	1.19
Total	2029	24941	38532	63473	831	1134	86505	28470	180413	139.93	399.44	86.43	15.66	61.59	0.0022	0.00054	0.03	9.52	5.00	1.23
Total	2030	26501	40942	67443	853	1134	86505	28470	184405	139.93	400.22	86.43	15.66	63.32	0.0022	0.00054	0.03	9.83	5.43	1.33
Total	2031	26836	41806	68642	855	1134	86505	28470	185606	139.93	400.25	86.43	15.66	63.82	0.0022	0.00054	0.03	9.93	5.57	1.37
Total	2032	26461	41223	67684	853	1134	86505	28470	184646	139.93	400.68	86.43	15.66	63.43	0.0022	0.00054	0.03	9.86	5.47	1.34
Total	2033	25041	39010	64051	831	1134	86505	28470	180991	139.93	400.22	86.43	15.66	61.85	0.0022	0.00054	0.03	9.57	5.07	1.25
Total	2034	24373	37970	62343	826	1134	86505	28470	179278	139.93	400.80	86.43	15.66	61.10	0.0022	0.00054	0.03	9.44	4.89	1.20
Total	2035	24468	38118	62586	839	1134	86505	28470	179534	139.93	402.42	86.43	15.66	61.24	0.0022	0.00054	0.03	9.46	4.92	1.21
Total	2036	24436	38066	62502	839	1134	86505	28470	179450	139.93	402.64	86.43	15.66	61.20	0.0022	0.00054	0.03	9.45	4.91	1.21
Total	2037	24550	38244	62794	852	1134	86505	28470	179755	139.93	404.19	86.43	15.66	61.36	0.0022	0.00054	0.03	9.47	4.95	1.21
Total	2038	25158	39192	64350	844	1134	86505	28470	181303	139.93	402.65	86.43	15.66	62.01	0.0022	0.00054	0.03	9.60	5.11	1.25
Total	2039	24843	38701	63544	866	1134	86505	28470	180519	139.93	402.84	86.43	15.66	61.71	0.0022	0.00054	0.03	9.53	5.03	1.23
Total	2040	23719	36950	60669	858	1134	86505	28470	177636	139.93	403.61	86.43	15.66	60.43	0.0022	0.00054	0.03	9.30	4.72	1.16
Total	2041	22983	35804	58787	858	1134	86505	28470	175754	139.93	403.80	86.43	15.66	59.58	0.0022	0.00054	0.03	9.14	4.53	1.11
Total	2042	22255	34670	56925	829	1134	86505	28470	173863	139.93	404.59	86.43	15.66	58.66	0.0022	0.00054	0.03	8.98	4.33	1.06
Total	2043	21628	33693	55321	812	1134	86505	28470	172242	139.93	403.71	86.43	15.66	57.87	0.0022	0.00054	0.03	8.84	4.17	1.02
Total	2044	21009	32728	53737	772	1134	86505	28470	170618	139.93	406.25	86.43	15.66	57.04	0.0022	0.00054	0.03	8.70	4.00	0.98
Total	2045	20205	31476	51681	755	1134	86505	28470	168545	139.93	405.25	86.43	15.66	55.99	0.0022	0.00054	0.03	8		

AERA - Santa Barbara County - Cat Canyon - ECC Project

Solvents and Coatings Emissions

Product	Use	Xylene (concentration)	Xylene Density (lbs/gal)	Xylene Em. Factor (lbs/gal)	Ethylbenzene (concentration)	Ethylbenzene Density (lbs/gal)	Ethylbenzene Em. Factor (lbs/gal)	Epichlorohydrin (concentration)	Epichlorohydrin Density (lbs/gal)	Epichlorohydrin Em. Factor (lbs/gal)	2-Propanol (concentration)	2-Propanol Density (lbs/gal)	Propanol Em. Factor (lbs/gal)	Methanol (concentration)	Methanol Density (lbs/gal)	Methanol Em. Factor (lbs/gal)	Propylene glycol monomethyl ether (concentration)	Propylene glycol monomethyl ether Density (lbs/gal)	Propylene glycol monomethyl ether Em. Factor (lbs/gal)
Amerlock 400 Resin	250.75	0%	0.00	0.00	0%	0	0	4.69%	9.8	0.46	0.00%	0.00	0.00	0.00%	0.00	0.00	0%	0	0
Amerlock 400 Curina Agent	250.75	0%	0.00	0.00	0%	0	0	0.00%	0	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0%	0	0
Amershield Resin	384.8	6.25%	7.26	0.45	2%	7.23	0.13	0%	0	0	0.00%	0	0	0.00%	0	0	0%	0	0
Amershield Curina Agent	96.2	0.00%	0.00	0.00	0%	0	0	0%	0	0	0.00%	0	0	0.00%	0	0	0%	0	0
Hemadur 15570 Curina Agent	19.28	15%	7.26	1.09	3.75%	7.23	0.27	0.0006%	9.8	5.63E-05	0.00%	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00	0%	0	0
Hemadur 15570 Resin	57.84	17.5%	7.26	1.27	4.00%	7.23	0.29	1.31%	9.8	1.29E-01	0.00%	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00	0%	0	0
Urethaneur 17999	19	3%	7.26	0.22	0	0	0	0.39%	9.8	2.76E-02	0.00%	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00	0%	0	0
Surfreat	945	0%	0.00	0.00	0	0	0	0.00%	0	0.00E+00	5.00%	6.70E+00	3.35E-01	2.50%	6.60E+00	1.65E-01	0%	0	0
Interseal 670 HS Part B	10.5	17.5%	7.26	1.27	0	0	0	0.00%	0	0.00E+00	0.00%	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00	0%	0	0
Interseal 670 HS Part A	10.5	5.5%	7.26	0.40	5.80%	7.23	0.40	1.31%	9.8	1.29E-01	0.00%	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00	5.50%	7.65	0.42

*Amerlock is only used in the Brine Tank area. The other solvents/coatings are divided amongst the other volume source area (excluding wells) by the modeled square footage as shown below in table J-16.

CAS No.	Solvents/Coatings (Excluding Amerlock)		Amerlock	
	lbs/yr	lbs/day	lbs/yr	lbs/day
1330207	2.91E+02	7.96E-01	0.00E+00	0.00E+00
100414	7.48E+01	2.05E-01	0.00E+00	0.00E+00
106899	9.33E+00	2.55E-02	1.15E+02	3.16E-01
67630	3.16E+02	8.67E-01	0.00E+00	0.00E+00
92261	1.36E+02	4.27E-01	0.00E+00	0.00E+00
107982	4.42E+00	1.21E-02	0.00E+00	0.00E+00
ROC Total	8.51E+02	2.33E+00	1.15E+02	3.16E-01

Stationary Source Operational Emissions

- Stationary Source Emissions Summary
 - Emergency Generator Emissions
 - Flare Emissions
- Equipment Component Leaks Fugitive Emissions
 - Equipment Component Counts
 - Truck Loading Rack Emissions
 - Steam Generators Emissions
 - Storage Tanks Emissions
- Indirect Electrical Generation Emissions

Stationary Source Emissions Summary

With 88% utilization for Steam Generators

Equipment Description	VOC (lb/day)	CO (lb/day)	NO _x (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	SO _x (lb/day)	VOC (ton/yr)	CO (ton/yr)	NO _x (ton/yr)	PM ₁₀ (ton/yr)	PM _{2.5} (ton/yr)	SO _x (ton/yr)	CO _{2e} (tonne/yr)
PHASE ONE													
85 MM Btu/hr Natural Gas Fired Steam Generator	3.26	37.56	12.34	1.43	1.43	5.81	0.52	6.03	1.98	0.23	0.23	0.93	34,775.32
85 MM Btu/hr Natural Gas Fired Steam Generator	3.26	37.56	12.34	1.43	1.43	5.81	0.52	6.03	1.98	0.23	0.23	0.93	34,775.32
85 MM Btu/hr Natural Gas Fired Steam Generator	3.26	37.56	12.34	1.43	1.43	5.81	0.52	6.03	1.98	0.23	0.23	0.93	34,775.32
62.5 MM Btu/hr Natural Gas Fired Steam Generator*	2.40	27.62	12.71	7.50	7.50	19.05	0.39	4.43	2.04	1.20	1.20	3.06	25,570.09
Emergency Flare (1.5 hr/day, 180 hr/yr, 40MMbtu/hr) ⁷	6.00	18.60	4.08	1.20	1.20	0.82	0.36	1.12	0.24	0.07	0.07	0.05	382.12
1,126 Bhp Limited Use Electrical Generator (600 hr/yr)*	2.85	12.45	4.09	0.18	0.18	0.34	0.04	0.16	0.05	0.00	0.00	0.00	272.50
HCO Truck Loading Rack (10,000 bbl/day)	5.95	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.00	0.00	0.00	20.77
6,500 Bbl Dilluent Storage Tank T-2040	3.56	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	12.38
10,000 Bbl Oil Storage Tank T-2170	1.84	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	6.48
1000 Bbl Sludge Tank T-7030	0.16	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.57
1000 Bbl Skim Tank T-7070	0.41	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	1.52
100 Bbl Drain Tank T-9560	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 1 Fugitives	12.29	0.00	0.00	0.00	0.00	0.00	2.24	0.00	0.00	0.00	0.00	0.00	88.28
Worst Case Sub Total =	45.25	171.35	57.90	13.17	13.17	37.64	6.78	23.80	8.27	1.96	1.96	5.90	130,680.67
PHASE TWO													
85 MM Btu/hr Natural Gas Fired Steam Generator	3.26	37.56	12.34	1.43	1.43	5.81	0.52	6.03	1.98	0.23	0.23	0.93	34,775.32
85 MM Btu/hr Natural Gas Fired Steam Generator	3.26	37.56	12.34	1.43	1.43	5.81	0.52	6.03	1.98	0.23	0.23	0.93	34,775.32
85 MM Btu/hr Natural Gas Fired Steam Generator	3.26	37.56	12.34	1.43	1.43	5.81	0.52	6.03	1.98	0.23	0.23	0.93	34,775.32
HCO Truck Loading Rack (+10,000 bbl/day)	5.95	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.00	0.00	0.00	20.77
6,500 Bbl Dilluent (LCO) Storage Tank T-2050	3.56	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	12.38
10,000 Bbl COS Stock Oil Storage Tank T-2180	1.84	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	6.48
1000 Bbl Sludge Tank T-7140	0.16	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.57
1000 Bbl Skim Oil Tank T-7180	0.41	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	1.52
100 Bbl Drain Tank T-9600	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 Fugitives (added components)	8.87	0.00	0.00	0.00	0.00	0.00	1.62	0.00	0.00	0.00	0.00	0.00	62.73
Worst Case Sub Total =	30.58	112.68	37.02	4.29	4.29	17.43	5.37	18.09	5.94	0.69	0.69	2.79	104,430.41
Worst Case Total =	75.83	284.03	94.92	17.46	17.46	55.07	12.15	41.89	14.21	2.65	2.65	8.69	235,111.08

Internal Combustion Engine Emission Calculations

COMPANY NAME: Aera Energy LLC

EQUIPMENT DESCRIPTION: 1126 hp I.C. Engine
 Fuel Type: Natural Gas

Engine Specifications
 8,557,600 Btu/hr
 5,134.56 MM Btu/yr

Operating Hours: 24 hr/day
 600 hr/yr

EMISSION FACTORS (grams/hp - hour)	NOx	SO2	PM10	CO	VOC
	0.069	*	0.003	0.209	0.048
lbm/hr	0.17	0.01	0.01	0.52	0.12
lbm/day	4.09	0.34	0.18	12.45	2.85
ton/year	0.05	0.00	0.00	0.16	0.04

* lb SO2/hr = (Bhp/hr)*(10 cu. ft./Bhp)*(0.88gr/100 cu. ft.)*(1lb/7000 gr)

PM10 = AP-42 Emission Factor
 NOx - Manufactures Guarantee
 VOC - Manufactures Guarantee
 CO - Manufactures Guarantee

Fuel	Units	Totals
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Natural Gas	MM Btu	5,134.56
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CO2: Tier 1 C-1b	CO2 EF (kg CO2 / MMBTU nat gas) ^A	53.02	
CH4: C-8b	CO2 Emissions (metric tons)	272.23	= Metric tons CO2 / yr
N2O: C-8b	CH4 EF (kg CH4 / MMBTU nat gas) ^B	0.001000	
	CH4 Emissions (metric tons)	0.005	= Metric tons CH4 / yr
	N2O EF (kg N2O / MMBTU nat gas) ^B	0.000100	
	N2O Emissions (metric tons)	0.00051	= Metric tons N2O / yr

CO2e = 272.50 = Metric tons/yr

Aera Energy LLC

Attachment

Permit Number:

Facility: East Cat Canyon

Flare Emission Calculations

		Reference
Flare Throughput	0.057 MMScf/day	Permit Application
Gas Btu Content	1,050 Btu/scf	Permit Application
Sulfur Content	80 ppmv as H2S	Permit Application

Emission Factors	lb/MMBtu	Reference
NOx	0.0680	AP-42, Table 13.5-1
ROC	0.1000	Manufacturer Guarantee @ 98% destruction efficiency & a THC EF of 0.14 lb/MM Btu
SOx	0.0137	Mass Balance Calculation
CO	0.3100	AP-42
PM	0.0200	APCD
PM10	0.0200	APCD

Btu Throughput	Reference
40.000 MMBtu/hour	Permit Application
60.000 MMBtu/day	MM Btu/hr times 1.5 hr/day
7,200.0 MMBtu/year	MM Btu/hr times 180 hr/yr

Emissions

	NOx	SOx	PM	PM10	CO	ROC
lb/hour	2.72	0.55	0.80	0.80	12.40	4.00
lb/day	4.08	0.82	1.20	1.20	18.60	6.00
ton/year	0.24	0.05	0.07	0.07	1.12	0.36

GHG Emissions	<u>Metric TPY</u>
CO2	381.744
CH4	0.0072
N2O	0.00072
CO2e	382.1184

Hourly Heat Release	40.000	MMBtu/hr
Daily Heat Release.....	60.000	MMBtu/day
Annual Heat Release	7,200.000	MMBtu/yr

Santa Barbara County APCD Fugitive ROC Emissions Calculation - CLP Method

ADMINISTRATIVE INFORMATION									
Attachment:									
Company:	Aera Energy LLC								
Facility:	ECC Brooks Development - Phase 1								
Processed by:	Doug mcCormick								
Date:	2/12/2016								
Path & File Name:	#N/A								
Facility Type: (Choose one facility type by marking the box to the right of the facility type with an "x")									
Production Field	<input checked="" type="checkbox"/>	Gas Processing Plant		Refinery		Offshore Platform			
Component:	Count	THC ¹ Emission Factor (lb/day- etc)	ROC/THC Ratio	Uncontrolled ROC Emission (lb/day)	Control ^{2,3} Efficiency	Controlled ROC Emission (lb/hr)	Controlled ROC Emission (lb/day)	Controlled ROC Emission (Tons/Otr)	Controlled ROC Emission (Tons/Yr)
Gas Condensate Service									
Valves - Accessible/Inaccessible		0.295	0.31	0.00	0.80	0.00	0.00	0.00	0.00
Valves - Unsafe		0.295	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Valves - Bellows		0.295	0.31	0.00	0.90	0.00	0.00	0.00	0.00
Valves - Bellows / Background ppmv		0.295	0.31	0.00	1.00	0.00	0.00	0.00	0.00
Valves - Category A		0.295	0.31	0.00	0.84	0.00	0.00	0.00	0.00
Valves - Category B		0.295	0.31	0.00	0.85	0.00	0.00	0.00	0.00
Valves - Category C		0.295	0.31	0.00	0.87	0.00	0.00	0.00	0.00
Valves - Category D		0.295	0.31	0.00	0.87	0.00	0.00	0.00	0.00
Valves - Category E		0.295	0.31	0.00	0.88	0.00	0.00	0.00	0.00
Valves - Category F		0.295	0.31	0.00	0.90	0.00	0.00	0.00	0.00
Valves - Category G	716	0.295	0.31	65.48	0.92	0.22	5.24	0.24	0.96
Flanges/Connections - Accessible/Inaccessible		0.070	0.31	0.00	0.80	0.00	0.00	0.00	0.00
Flanges/Connections - Unsafe		0.070	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Flanges/Connections - Category A		0.070	0.31	0.00	0.84	0.00	0.00	0.00	0.00
Flanges/Connections - Category B		0.070	0.31	0.00	0.85	0.00	0.00	0.00	0.00
Flanges/Connections - Category C		0.070	0.31	0.00	0.87	0.00	0.00	0.00	0.00
Flanges/Connections - Category D		0.070	0.31	0.00	0.87	0.00	0.00	0.00	0.00
Flanges/Connections - Category E		0.070	0.31	0.00	0.88	0.00	0.00	0.00	0.00
Flanges/Connections - Category F		0.070	0.31	0.00	0.90	0.00	0.00	0.00	0.00
Flanges/Connections - Category G	2,171	0.070	0.31	47.11	0.92	0.16	3.77	0.17	0.69
Compressor Seals - To Atm	2	2.143	0.31	1.33	0.80	0.01	0.27	0.01	0.05
Compressor Seals - To VRS		2.143	0.31	0.00	1.00	0.00	0.00	0.00	0.00
PSV - To Atm/Flare	4	6.670	0.31	8.27	0.80	0.07	1.65	0.08	0.30
PSV - To VRS	33	6.670	0.31	68.23	1.00	0.00	0.00	0.00	0.00
Pump Seals - Single		1.123	0.31	0.00	0.80	0.00	0.00	0.00	0.00
Pump Seals - Dual/Tandem		1.123	0.31	0.00	1.00	0.00	0.00	0.00	0.00
Sub Total	2,926			190.42		0.455	10.927	0.499	1.994

Santa Barbara County APCD Fugitive ROC Emissions Calculation - CLP Method

ADMINISTRATIVE INFORMATION									
Attachment:									
Company:	Aera Energy LLC								
Facility:	ECC Brooks Development - Phase 1								
Processed by:	Doug mcCormick								
Date:	2/12/2016								
Path & File Name:	#N/A								
Facility Type: (Choose one facility type by marking the box to the right of the facility type with an "x")									
Production Field	<input checked="" type="checkbox"/>	Gas Processing Plant		Refinery		Offshore Platform			
Component:	Count	THC ¹ Emission Factor (lb/day- op)	ROC/THC Ratio	Uncontrolled ROC Emission (lb/day)	Control ^{2,3} Efficiency	Controlled ROC Emission (lb/hr)	Controlled ROC Emission (lb/day)	Controlled ROC Emission (Tons/Otr)	Controlled ROC Emission (Tons/Yr)
Oil Service									
Valves - Accessible/Inaccessible		0.0041	0.56	0.00	0.80	0.00	0.00	0.00	0.00
Valves - Unsafe		0.0041	0.56	0.00	0.00	0.00	0.00	0.00	0.00
Valves - Bellows		0.0041	0.56	0.00	0.90	0.00	0.00	0.00	0.00
Valves - Bellows / Background ppmv		0.0041	0.56	0.00	1.00	0.00	0.00	0.00	0.00
Valves - Category A		0.0041	0.56	0.00	0.84	0.00	0.00	0.00	0.00
Valves - Category B		0.0041	0.56	0.00	0.85	0.00	0.00	0.00	0.00
Valves - Category C		0.0041	0.56	0.00	0.87	0.00	0.00	0.00	0.00
Valves - Category D		0.0041	0.56	0.00	0.87	0.00	0.00	0.00	0.00
Valves - Category E		0.0041	0.56	0.00	0.88	0.00	0.00	0.00	0.00
Valves - Category F		0.0041	0.56	0.00	0.90	0.00	0.00	0.00	0.00
Valves - Category G	3,907	0.0041	0.56	8.97	0.92	0.03	0.72	0.03	0.13
Flanges/Connections - Accessible/Inaccessible		0.002	0.56	0.00	0.80	0.00	0.00	0.00	0.00
Flanges/Connections - Unsafe		0.002	0.56	0.00	0.00	0.00	0.00	0.00	0.00
Flanges/Connections - Category A		0.002	0.56	0.00	0.84	0.00	0.00	0.00	0.00
Flanges/Connections - Category B		0.002	0.56	0.00	0.85	0.00	0.00	0.00	0.00
Flanges/Connections - Category C		0.002	0.56	0.00	0.87	0.00	0.00	0.00	0.00
Flanges/Connections - Category D		0.002	0.56	0.00	0.87	0.00	0.00	0.00	0.00
Flanges/Connections - Category E		0.002	0.56	0.00	0.88	0.00	0.00	0.00	0.00
Flanges/Connections - Category F		0.002	0.56	0.00	0.90	0.00	0.00	0.00	0.00
Flanges/Connections - Category G	6,862	0.002	0.56	7.69	0.92	0.03	0.61	0.03	0.11
PSV - To Atm/Flare	1	0.267	0.56	0.15	0.80	0.00	0.03	0.00	0.01
PSV - To VRS	12	0.267	0.56	1.79	1.00	0.00	0.00	0.00	0.00
Pump Seals - Single		0.0039	0.56	0.00	0.80	0.00	0.00	0.00	0.00
Pump Seals - Dual/Tandem	52	0.0039	0.56	0.11	1.00	0.00	0.00	0.00	0.00
Sub Total	10,834			18.71		0.057	1.362	0.062	0.249
Total	13,760			209.14		0.512	12.289	0.56	2.24
Notes:						GHG Contribution	CH4	CO2e	
1 APCD P&P # 6100.061.1998.							ton/yr	Tonnes/yr	
2 A 80% efficiency is assigned to fugitive components Rule 331 implementation.						Gas Service	4.44	84.56	
3 Emission Control efficiencies for the "category x" components are identified in "FHC Control Factors (ver 2.0)"						Oil Service	0.20	3.72	
						Total	4.63	88.28	

Santa Barbara County APCD Fugitive ROC Emissions Calculation - CLP Method

ADMINISTRATIVE INFORMATION									
Attachment:									
Company:	Aera Energy LLC								
Facility:	ECC Brooks Development - Phase 2 Increase								
Processed by:	Doug mcCormick								
Date:	2/12/2016								
Path & File Name:	#N/A								
Facility Type: (Choose one facility type by marking the box to the right of the facility type with an "x")									
Production Field	<input checked="" type="checkbox"/>	Gas Processing Plant	<input type="checkbox"/>	Refinery	<input type="checkbox"/>	Offshore Platform	<input type="checkbox"/>		
Component:	Count	THC ¹ Emission Factor (lb/day- etc)	ROC/THC Ratio	Uncontrolled ROC Emission (lb/day)	Control ^{2,3} Efficiency	Controlled ROC Emission (lb/hr)	Controlled ROC Emission (lb/day)	Controlled ROC Emission (Tons/Qtr)	Controlled ROC Emission (Tons/Yr)
Gas Condensate Service									
Valves - Accessible/Inaccessible		0.295	0.31	0.00	0.80	0.00	0.00	0.00	0.00
Valves - Unsafe		0.295	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Valves - Bellows		0.295	0.31	0.00	0.90	0.00	0.00	0.00	0.00
Valves - Bellows / Background ppmv		0.295	0.31	0.00	1.00	0.00	0.00	0.00	0.00
Valves - Category A		0.295	0.31	0.00	0.84	0.00	0.00	0.00	0.00
Valves - Category B		0.295	0.31	0.00	0.85	0.00	0.00	0.00	0.00
Valves - Category C		0.295	0.31	0.00	0.87	0.00	0.00	0.00	0.00
Valves - Category D		0.295	0.31	0.00	0.87	0.00	0.00	0.00	0.00
Valves - Category E		0.295	0.31	0.00	0.88	0.00	0.00	0.00	0.00
Valves - Category F		0.295	0.31	0.00	0.90	0.00	0.00	0.00	0.00
Valves - Category G	437	0.295	0.31	39.96	0.92	0.13	3.20	0.15	0.58
Flanges/Connections - Accessible/Inaccessible		0.070	0.31	0.00	0.80	0.00	0.00	0.00	0.00
Flanges/Connections - Unsafe		0.070	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Flanges/Connections - Category A		0.070	0.31	0.00	0.84	0.00	0.00	0.00	0.00
Flanges/Connections - Category B		0.070	0.31	0.00	0.85	0.00	0.00	0.00	0.00
Flanges/Connections - Category C		0.070	0.31	0.00	0.87	0.00	0.00	0.00	0.00
Flanges/Connections - Category D		0.070	0.31	0.00	0.87	0.00	0.00	0.00	0.00
Flanges/Connections - Category E		0.070	0.31	0.00	0.88	0.00	0.00	0.00	0.00
Flanges/Connections - Category F		0.070	0.31	0.00	0.90	0.00	0.00	0.00	0.00
Flanges/Connections - Category G	1,481	0.070	0.31	32.14	0.92	0.11	2.57	0.12	0.47
Compressor Seals - To Atm	2	2.143	0.31	1.33	0.80	0.01	0.27	0.01	0.05
Compressor Seals - To VRS		2.143	0.31	0.00	1.00	0.00	0.00	0.00	0.00
PSV - To Atm/Flare	4	6.670	0.31	8.27	0.80	0.07	1.65	0.08	0.30
PSV - To VRS	28	6.670	0.31	57.90	1.00	0.00	0.00	0.00	0.00
Pump Seals - Single		1.123	0.31	0.00	0.80	0.00	0.00	0.00	0.00
Pump Seals - Dual/Tandem	2	1.123	0.31	0.70	1.00	0.00	0.00	0.00	0.00
Sub Total	1,954			140.29		0.320	7.688	0.351	1.403

Santa Barbara County APCD Fugitive ROC Emissions Calculation - CLP Method

ADMINISTRATIVE INFORMATION									
Attachment:									
Company:	Aera Energy LLC								
Facility:	ECC Brooks Development - Phase 2 Increase								
Processed by:	Doug mcCormick								
Date:	2/12/2016								
Path & File Name:	#N/A								
Facility Type: (Choose one facility type by marking the box to the right of the facility type with an "x")									
Production Field	<input checked="" type="checkbox"/>	Gas Processing Plant		<input type="checkbox"/>	Refinery		<input type="checkbox"/>	Offshore Platform	
Component:	Count	THC ¹ Emission Factor (lb/day- op)	ROC/THC Ratio	Uncontrolled ROC Emission (lb/day)	Control ^{2,3} Efficiency	Controlled ROC Emission (lb/hr)	Controlled ROC Emission (lb/day)	Controlled ROC Emission (Tons/Qt)	Controlled ROC Emission (Tons/Yr)
Oil Service									
Valves - Accessible/Inaccessible		0.0041	0.56	0.00	0.80	0.00	0.00	0.00	0.00
Valves - Unsafe		0.0041	0.56	0.00	0.00	0.00	0.00	0.00	0.00
Valves - Bellows		0.0041	0.56	0.00	0.90	0.00	0.00	0.00	0.00
Valves - Bellows / Background ppmv		0.0041	0.56	0.00	1.00	0.00	0.00	0.00	0.00
Valves - Category A		0.0041	0.56	0.00	0.84	0.00	0.00	0.00	0.00
Valves - Category B		0.0041	0.56	0.00	0.85	0.00	0.00	0.00	0.00
Valves - Category C		0.0041	0.56	0.00	0.87	0.00	0.00	0.00	0.00
Valves - Category D		0.0041	0.56	0.00	0.87	0.00	0.00	0.00	0.00
Valves - Category E		0.0041	0.56	0.00	0.88	0.00	0.00	0.00	0.00
Valves - Category F		0.0041	0.56	0.00	0.90	0.00	0.00	0.00	0.00
Valves - Category G	3,435	0.0041	0.56	7.89	0.92	0.03	0.63	0.03	0.12
Flanges/Connections - Accessible/Inaccessible		0.002	0.56	0.00	0.80	0.00	0.00	0.00	0.00
Flanges/Connections - Unsafe		0.002	0.56	0.00	0.00	0.00	0.00	0.00	0.00
Flanges/Connections - Category A		0.002	0.56	0.00	0.84	0.00	0.00	0.00	0.00
Flanges/Connections - Category B		0.002	0.56	0.00	0.85	0.00	0.00	0.00	0.00
Flanges/Connections - Category C		0.002	0.56	0.00	0.87	0.00	0.00	0.00	0.00
Flanges/Connections - Category D		0.002	0.56	0.00	0.87	0.00	0.00	0.00	0.00
Flanges/Connections - Category E		0.002	0.56	0.00	0.88	0.00	0.00	0.00	0.00
Flanges/Connections - Category F		0.002	0.56	0.00	0.90	0.00	0.00	0.00	0.00
Flanges/Connections - Category G	5,855	0.002	0.56	6.56	0.92	0.02	0.52	0.02	0.10
PSV - To Atm/Flare	1	0.267	0.56	0.15	0.80	0.00	0.03	0.00	0.01
PSV - To VRS	10	0.267	0.56	1.50	1.00	0.00	0.00	0.00	0.00
Pump Seals - Single		0.0039	0.56	0.00	0.80	0.00	0.00	0.00	0.00
Pump Seals - Dual/Tandem	35	0.0039	0.56	0.08	1.00	0.00	0.00	0.00	0.00
Sub Total	9,336			16.17		0.049	1.185	0.054	0.216
Total	11,290			156.46		0.370	8.873	0.40	1.62
Notes:							GHG Contribution	CH4	CO2e
1 APCD P&P # 6100.061.1998.							Gas Service	ton/yr	Tonnes/yr
2 A 80% efficiency is assigned to fugitive components Rule 331 implementation.							Oil Service	3.12	59.49
3 Emission Control efficiencies for the "category x" components are identified in "FHC Control Factors (ver 2.0)"							Total	0.17	3.24
								3.29	62.73

Attachment: **E**
 Company: **Aera Energy**
 Facility: **East Cat Canyon**
 File Name: **Crude Oil shipping**

Reference: **Loading Rack**
 Rack Type: **Enter X as Appropriate** **S Factor**
 Submerged loading of a clean cargo tank _____ 0.50
 Submerged loading: Dedicated normal service **X** _____ 0.60
 Submerged loading: Dedicated vapor balance service _____ 1.00
 Splash loading of a clean cargo tank _____ 1.45
 Splash loading: Dedicated normal service _____ 1.45
 Splash loading: Dedicated vapor balance service _____ 1.00

Phase 1
One 10,000 Bbl storage tank
Shipping 7000 bbl/day

Input data Reference

S = Saturation Factor	0.60	See AP-42 Table 4.4-1	2
M = Molecular Weight	50	Crude Oil: Default = 50 lb/lb-mole	3
P = True Vapor Pressure (psia)	0.500	See AP-42 Table 12.3-5	1
T = Liquid Temperature °R	660	200 °F + 460 = °R	5
R = Loading Rate (bbl/hr)	416.67	<u>17,500</u> gallons (42 gallons = 1 bbl)	1
C = Truck Storage Capacity (bbl)	10,000	<u>420,000</u> gallons (42 gallons = 1 bbl)	1
D = Daily Production (bbl)	10,000	<u>420,000</u> gallons (42 gallons = 1 bbl)	1
A = Annual Production (bbl)	3,650,000	<u>153,300,000</u> gallons (42 gallons = 1 bbl)	1
eff = Vapor Recovery Efficiency	0.95	Default = 0.95	1
ROC/THC = Reactivity	0.885	Crude Oil: Default = 0.885	

HLPD = hours loading per day = (C/R) if < 24 = **24.00** **hours/day**
 HLPY = hours loading per year = (A/R) = **8,760.00** **hours/year**
 L_L = Loading loss (lb/1000 gal) = 12.46 (S)(P)(M)/T = **0.2832** **lb/1000 gal**

Total Uncontrolled Hydrocarbon Losses:

Hourly
 THL_H = (R)(42 gal/bbl)(L_L/1000) = **4.96** **lbs/hr**
Daily
 THL_D = (THL_H)(HLPD) = **118.94** **lbs/day**
Annual
 THL_A = (HLPY)((THL_H)(1/2000)) = **21.71** **TPY**

Total Controlled Hydrocarbon Losses:

Hourly
 THL_{HC} = (THL_H)(1-eff) = **0.25** **lbs/hr**
Daily
 THL_{DC} = (THL_D)(1-eff) = **5.95** **lbs/day**
Annual
 THL_{AC} = (THL_A)(1-eff) = **1.09** **TPY**

Processed by: **Doug McCormick**

Date: **July 15, 2015**

Notes:

1. Data provided by the applicant
2. AP-42, (Chapter 5, 5th Edition, January 1995), Table 5.2-1
3. If not otherwise provided, crude oil is assumed to be 50 lb/lb-mole.
4. If not otherwise provided, vapor pressure is calculated from CARB AB-2588 Guidelines, page 103, eq. 25
5. R is calculated by adding 460 to °F.

LOADING RACK EMISSION CALCULATION (ver 3.0)

Attachment: **E**
 Company: **Aera Energy**
 Facility: **East Cat Canyon**
 File Name: **Crude Oil shipping**

Reference: Loading Rack
 Rack Type: Enter X as Appropriate S Factor
 Submerged loading of a clean cargo tank _____ 0.50
 Submerged loading: Dedicated normal service **X** 0.60
 Submerged loading: Dedicated vapor balance service _____ 1.00
 Splash loading of a clean cargo tank _____ 1.45
 Splash loading: Dedicated normal service _____ 1.45
 Splash loading: Dedicated vapor balance service _____ 1.00

Phase 2 Increase
 Second 10,000 Bbl storage tank
 Shipping an additional 7000 bbl/day

Input data	Reference
S = Saturation Factor <u> 0.60 </u>	See AP-42 Table 4.4-1 2
M = Molecular Weight <u> 50 </u>	Crude Oil: Default = 50 lb/lb-mole 3
P = True Vapor Pressure (psia) <u> 0.500 </u>	See AP-42 Table 12.3-5 1
T = Liquid Temperature °R <u> 660 </u>	<u> 200 </u> °F + 460 = °R 5
R = Loading Rate (bbl/hr) <u> 416.67 </u>	<u> 17,500 </u> gallons (42 gallons = 1 bbl) 1
C = Storage Capacity (bbl) <u> 10,000 </u>	<u> 420,000 </u> gallons (42 gallons = 1 bbl) 1
D = Daily Production (bbl) <u> 10,000 </u>	<u> 420,000 </u> gallons (42 gallons = 1 bbl) 1
A = Annual Production (bbl) <u> 3,650,000 </u>	<u> 153,300,000 </u> gallons (42 gallons = 1 bbl) 1
eff = Vapor Recovery Efficiency <u> 0.95 </u>	Default = 0.95 1
ROC/THC = Reactivity <u> 0.885 </u>	Crude Oil: Default = 0.885

HLPD = hours loading per day = (C/R) if < 24 =	<u> 24.00 </u>	hours/day
HLPY = hours loading per year = (A/R) =	<u> 8,760.00 </u>	hours/year
L _L = Loading loss (lb/1000 gal) = 12.46 (S)(P)(M)/T =	<u> 0.2832 </u>	lb/1000 gal

Total Uncontrolled Hydrocarbon Losses:

Hourly
 THL_H = (R)(42 gal/bbl)(L_L/1000) = **4.96** lbs/hr

Daily
 THL_D = (THL_H)(HLPD) = **118.94** lbs/day

Annual
 THL_A = (HLPY)((THL_H)(1/2000)) = **21.71** TPY

Total Controlled Hydrocarbon Losses:

Hourly
 THL_{HC} = (THL_H)(1-eff) = **0.25** lbs/hr

Daily
 THL_{DC} = (THL_D)(1-eff) = **5.95** lbs/day

Annual
 THL_{AC} = (THL_A)(1-eff) = **1.09** TPY

Processed by: Name

Date: July 30, 2015

Notes:

1. Data provided by the applicant
2. AP-42, (Chapter 5, 5th Edition, January 1995), Table 5.2-1
3. If not otherwise provided, crude oil is assumed to be 50 lb/lb-mole.
4. If not otherwise provided, vapor pressure is calculated from CARB AB-2588 Guidelines, page 103, eq. 25
5. R is calculated by adding 460 to °F.

BOILER / STEAM GENERATOR CALCULATION WORKSHEET (ver. 6.0)

DATA

Permit No.	New		
Owner/Operator	Aera Energy		
Facility/Lease	East Cat Canyon		
Boiler Type	Firetube		
Boiler Mfg.	PLC Industries		
Boiler Model No.	NA		
Boiler Serial/ID No.	SG - 8620		
Boiler Horsepower	no data	Bhp	
Burner Type	Natural Gas		
Burner Mfg.	North American		
Burner Model No.	4231-85-GLE Ultra Low Nox		
Max. Firing Rate of Burner	85.000	MMBtu/hr	
Max. Annual Heat Input	744,600.000	MMBtu/yr	
Daily Operating schedule	24	hrs/day	
Yearly Load factor (%)	88	%	
Fuel Type	PUC Natural Gas		
High Heating Value	1,050	Btu/scf	
Sulfur Content of Fuel	16.00	ppmvd as H2S	
Nitrogen Content of Fuel	-	wt. % N	
Boiler Classification	Industrial		
Firing Type	Other Type		
PM Emission Factor	0.0007	lb/MMBtu	
PM ₁₀ Emission Factor	0.0007	lb/MMBtu	
NO _x Emission Factor	0.0061	lb/MMBtu	5 ppmv @ 3% O2
SO _x Emission Factor	0.0029	lb/MMBtu	
CO Emission Factor	0.0184	lb/MMBtu	
ROC Emission Factor	0.0016	lb/MMBtu	4 ppmv @ 3% O2

RESULTS

	<u>lb/hr</u>	<u>lb/day</u>	<u>TPY</u>
Nitrogen Oxides (as NO ₂)	0.51	12.34	1.98
Sulfur Oxides (as SO ₂)	0.24	5.81	0.93
PM ₁₀	0.06	1.43	0.23
Total Suspended Particulate (PM)	0.06	1.43	0.23
Carbon Monoxide	1.56	37.56	6.03
Reactive Organic Compounds (ROC)	0.14	3.26	0.52

	<u>Metric TPY</u>
GHG Emissions	
CO2	34741.25
CH4	0.655248
N2O	0.065525
CO2e	34775.32

Hourly Heat Release	85.000	MMBtu/hr
Daily Heat Release.....	2,040.000	MMBtu/day
Annual Heat Release	655,248.000	MMBtu/yr
Rule 342 Applicability	655.2	Billion Btu/yr

BOILER / STEAM GENERATOR CALCULATION WORKSHEET (ver. 6.0)**DATA**

Permit No.	New
Owner/Operator	Aera Energy
Facility/Lease	East Cat Canyon
Boiler Type	Firetube
Boiler Mfg.	PLC Industries
Boiler Model No.	NA
Boiler Serial/ID No.	SG - 8520
Boiler Horsepower	no data Bhp
Burner Type	Natural Gas
Burner Mfg.	North American
Burner Model No.	4231-85-GLE Ultra Low Nox
Max. Firing Rate of Burner	85.000 MMBtu/hr
Max. Annual Heat Input	744,600.000 MMBtu/yr
Daily Operating schedule	24 hrs/day
Yearly Load factor (%)	88 %
Fuel Type	PUC Natural Gas
High Heating Value	1,050 Btu/scf
Sulfur Content of Fuel	16.00 ppmvd as H2S
Nitrogen Content of Fuel	- wt. % N
Boiler Classification	Industrial
Firing Type	Other Type
PM Emission Factor	0.0007 lb/MMBtu
PM ₁₀ Emission Factor	0.0007 lb/MMBtu
NO _x Emission Factor	0.0061 lb/MMBtu 5 ppmv @ 3% O2
SO _x Emission Factor	0.0029 lb/MMBtu
CO Emission Factor	0.0184 lb/MMBtu
ROC Emission Factor	0.0016 lb/MMBtu 4 ppmv @ 3% O2

RESULTS

	<u>lb/hr</u>	<u>lb/day</u>	<u>TPY</u>
Nitrogen Oxides (as NO ₂)	0.51	12.34	1.98
Sulfur Oxides (as SO ₂)	0.24	5.81	0.93
PM ₁₀	0.06	1.43	0.23
Total Suspended Particulate (PM)	0.06	1.43	0.23
Carbon Monoxide	1.56	37.56	6.03
Reactive Organic Compounds (ROC)	0.14	3.26	0.52

GHG Emissions	<u>Metric TPY</u>
CO2	34741.25
CH4	0.655248
N2O	0.065525
CO2e	34775.32

Hourly Heat Release	85.000 MMBtu/hr
Daily Heat Release.....	2,040.000 MMBtu/day
Annual Heat Release	655,248.000 MMBtu/yr
Rule 342 Applicability	655.2 Billion Btu/yr

BOILER / STEAM GENERATOR CALCULATION WORKSHEET (ver. 6.0)**DATA**

Permit No.	New
Owner/Operator	Aera Energy
Facility/Lease	East Cat Canyon
Boiler Type	Firetube
Boiler Mfg.	PLC Industries
Boiler Model No.	NA
Boiler Serial/ID No.	SG - 8420
Boiler Horsepower	no data Bhp
Burner Type	Natural Gas
Burner Mfg.	North American
Burner Model No.	4231-85-GLE Ultra Low Nox
Max. Firing Rate of Burner	85.000 MMBtu/hr
Max. Annual Heat Input	744,600.000 MMBtu/yr
Daily Operating schedule	24 hrs/day
Yearly Load factor (%)	88 %
Fuel Type	PUC Natural Gas
High Heating Value	1,050 Btu/scf
Sulfur Content of Fuel	16.00 ppmvd as H2S
Nitrogen Content of Fuel	- wt. % N
Boiler Classification	Industrial
Firing Type	Other Type
PM Emission Factor	0.0007 lb/MMBtu
PM ₁₀ Emission Factor	0.0007 lb/MMBtu
NO _x Emission Factor	0.0061 lb/MMBtu 5 ppmv @ 3% O2
SO _x Emission Factor	0.0029 lb/MMBtu
CO Emission Factor	0.0184 lb/MMBtu
ROC Emission Factor	0.0016 lb/MMBtu 4 ppmv @ 3% O2

RESULTS

	<u>lb/hr</u>	<u>lb/day</u>	<u>TPY</u>
Nitrogen Oxides (as NO ₂)	0.51	12.34	1.98
Sulfur Oxides (as SO ₂)	0.24	5.81	0.93
PM ₁₀	0.06	1.43	0.23
Total Suspended Particulate (PM)	0.06	1.43	0.23
Carbon Monoxide	1.56	37.56	6.03
Reactive Organic Compounds (ROC)	0.14	3.26	0.52

GHG Emissions	<u>Metric TPY</u>
CO2	34741.25
CH4	0.655248
N2O	0.065525
CO2e	34775.32

Hourly Heat Release	85.000 MMBtu/hr
Daily Heat Release.....	2,040.000 MMBtu/day
Annual Heat Release	655,248.000 MMBtu/yr
Rule 342 Applicability	655.2 Billion Btu/yr

BOILER / STEAM GENERATOR CALCULATION WORKSHEET (ver. 6.0)

DATA

Permit No.	New		
Owner/Operator	Aera Energy		
Facility/Lease	East Cat Canyon		
Boiler Type	Firetube		
Boiler Mfg.	PLC Industries		
Boiler Model No.	NA		
Boiler Serial/ID No.	SG - 8320		
Boiler Horsepower	no data	Bhp	
Burner Type	Natural Gas		
Burner Mfg.	North American		
Burner Model No.	4231-85-GLE Ultra Low Nox		
Max. Firing Rate of Burner	85.000	MMBtu/hr	
Max. Annual Heat Input	744,600.000	MMBtu/yr	
Daily Operating schedule	24	hrs/day	
Yearly Load factor (%)	88	%	
Fuel Type	PUC Natural Gas		
High Heating Value	1,050	Btu/scf	
Sulfur Content of Fuel	16.00	ppmvd as H2S	
Nitrogen Content of Fuel	-	wt. % N	
Boiler Classification	Industrial		
Firing Type	Other Type		
PM Emission Factor	0.0007	lb/MMBtu	
PM ₁₀ Emission Factor	0.0007	lb/MMBtu	
NO _x Emission Factor	0.0061	lb/MMBtu	5 ppmv @ 3% O2
SO _x Emission Factor	0.0029	lb/MMBtu	
CO Emission Factor	0.0184	lb/MMBtu	
ROC Emission Factor	0.0016	lb/MMBtu	4 ppmv @ 3% O2

RESULTS

	<u>lb/hr</u>	<u>lb/day</u>	<u>TPY</u>
Nitrogen Oxides (as NO ₂)	0.51	12.34	1.98
Sulfur Oxides (as SO ₂)	0.24	5.81	0.93
PM ₁₀	0.06	1.43	0.23
Total Suspended Particulate (PM)	0.06	1.43	0.23
Carbon Monoxide	1.56	37.56	6.03
Reactive Organic Compounds (ROC)	0.14	3.26	0.52

	<u>Metric TPY</u>
GHG Emissions	
CO2	34741.25
CH4	0.655248
N2O	0.065525
CO2e	34775.32

Hourly Heat Release	85.000	MMBtu/hr
Daily Heat Release.....	2,040.000	MMBtu/day
Annual Heat Release	655,248.000	MMBtu/yr
Rule 342 Applicability	655.2	Billion Btu/yr

BOILER / STEAM GENERATOR CALCULATION WORKSHEET (ver. 6.0)

DATA

Permit No.	New		
Owner/Operator	Aera Energy		
Facility/Lease	East Cat Canyon		
Boiler Type	Firetube		
Boiler Mfg.	PLC Industries		
Boiler Model No.	NA		
Boiler Serial/ID No.	SG - 8220		
Boiler Horsepower	no data	Bhp	
Burner Type	Natural Gas		
Burner Mfg.	North American		
Burner Model No.	4231-85-GLE Ultra Low Nox		
Max. Firing Rate of Burner	85.000	MMBtu/hr	
Max. Annual Heat Input	744,600.000	MMBtu/yr	
Daily Operating schedule	24	hrs/day	
Yearly Load factor (%)	88	%	
Fuel Type	PUC Natural Gas		
High Heating Value	1,050	Btu/scf	
Sulfur Content of Fuel	16.00	ppmvd as H2S	
Nitrogen Content of Fuel	-	wt. % N	
Boiler Classification	Industrial		
Firing Type	Other Type		
PM Emission Factor	0.0007	lb/MMBtu	
PM ₁₀ Emission Factor	0.0007	lb/MMBtu	
NO _x Emission Factor	0.0061	lb/MMBtu	5 ppmv @ 3% O2
SO _x Emission Factor	0.0029	lb/MMBtu	
CO Emission Factor	0.0184	lb/MMBtu	
ROC Emission Factor	0.0016	lb/MMBtu	4 ppmv @ 3% O2

RESULTS

	<u>lb/hr</u>	<u>lb/day</u>	<u>TPY</u>
Nitrogen Oxides (as NO ₂)	0.51	12.34	1.98
Sulfur Oxides (as SO ₂)	0.24	5.81	0.93
PM ₁₀	0.06	1.43	0.23
Total Suspended Particulate (PM)	0.06	1.43	0.23
Carbon Monoxide	1.56	37.56	6.03
Reactive Organic Compounds (ROC)	0.14	3.26	0.52

	<u>Metric TPY</u>
GHG Emissions	
CO2	34741.25
CH4	0.655248
N2O	0.065525
CO2e	34775.32

Hourly Heat Release	85.000	MMBtu/hr
Daily Heat Release.....	2,040.000	MMBtu/day
Annual Heat Release	655,248.000	MMBtu/yr
Rule 342 Applicability	655.2	Billion Btu/yr

BOILER / STEAM GENERATOR CALCULATION WORKSHEET (ver. 6.0)

DATA

Permit No.	New		
Owner/Operator	Aera Energy		
Facility/Lease	East Cat Canyon		
Boiler Type	Firetube		
Boiler Mfg.	PLC Industries		
Boiler Model No.	NA		
Boiler Serial/ID No.	SG - 8120		
Boiler Horsepower	no data	Bhp	
Burner Type	Natural Gas		
Burner Mfg.	North American		
Burner Model No.	4231-85-GLE Ultra Low Nox		
Max. Firing Rate of Burner	85.000	MMBtu/hr	
Max. Annual Heat Input	744,600.000	MMBtu/yr	
Daily Operating schedule	24	hrs/day	
Yearly Load factor (%)	88	%	
Fuel Type	PUC Natural Gas		
High Heating Value	1,050	Btu/scf	
Sulfur Content of Fuel	16.00	ppmvd as H2S	
Nitrogen Content of Fuel	-	wt. % N	
Boiler Classification	Industrial		
Firing Type	Other Type		
PM Emission Factor	0.0007	lb/MMBtu	
PM ₁₀ Emission Factor	0.0007	lb/MMBtu	
NO _x Emission Factor	0.0061	lb/MMBtu	5 ppmv @ 3% O2
SO _x Emission Factor	0.0029	lb/MMBtu	
CO Emission Factor	0.0184	lb/MMBtu	
ROC Emission Factor	0.0016	lb/MMBtu	4 ppmv @ 3% O2

RESULTS

	<u>lb/hr</u>	<u>lb/day</u>	<u>TPY</u>
Nitrogen Oxides (as NO ₂)	0.51	12.34	1.98
Sulfur Oxides (as SO ₂)	0.24	5.81	0.93
PM ₁₀	0.06	1.43	0.23
Total Suspended Particulate (PM)	0.06	1.43	0.23
Carbon Monoxide	1.56	37.56	6.03
Reactive Organic Compounds (ROC)	0.14	3.26	0.52

	<u>Metric TPY</u>
GHG Emissions	
CO2	34741.25
CH4	0.655248
N2O	0.065525
CO2e	34775.32

Hourly Heat Release	85.000	MMBtu/hr
Daily Heat Release.....	2,040.000	MMBtu/day
Annual Heat Release	655,248.000	MMBtu/yr
Rule 342 Applicability	655.2	Billion Btu/yr

Attachment:

E

Date: 07/26/18

BOILER / STEAM GENERATOR CALCULATION WORKSHEET (ver. 6.0)**DATA**

Permit No.	New
Owner/Operator	Aera Energy
Facility/Lease	East Cat Canyon
Boiler Type	Firetube
Boiler Mfg.	PCL Industries or Equivalent
Boiler Model No.	NA
Boiler Serial/ID No.	SG - 6030
Boiler Horsepower	no data Bhp
Burner Type	Natural Gas
Burner Mfg.	North American
Burner Model No.	4231-62.5-GLE Ultra Low Nox
Max. Firing Rate of Burner	62.500 MMBtu/hr
Max. Annual Heat Input	547,500.000 MMBtu/yr
Daily Operating schedule	24 hrs/day
Yearly Load factor (%)	88.00 % Produced Gas flared for 240 hr/yr
Fuel Type	PUC Natural Gas and Produced Gas
High Heating Value	1050 - 1200 Btu/scf
Sulfur Content of Fuel	80.00 ppmvd as H2S
Nitrogen Content of Fuel	- wt. % N
Boiler Classification	Industrial
Firing Type	Other Type
PM Emission Factor	0.0050 lb/MMBtu
PM ₁₀ Emission Factor	0.0050 lb/MMBtu
NO _x Emission Factor	0.0085 lb/MMBtu 7 ppmv @ 3% O2
SO _x Emission Factor	0.0127 lb/MMBtu
CO Emission Factor	0.0184 lb/MMBtu
ROC Emission Factor	0.0016 lb/MMBtu 4 ppmv @ 3% O2

RESULTS

	<u>lb/hr</u>	<u>lb/day</u>	<u>TPY</u>
Nitrogen Oxides (as NO ₂)	0.53	12.71	2.04
Sulfur Oxides (as SO ₂)	0.79	19.05	3.06
PM ₁₀	0.31	7.50	1.20
Total Suspended Particulate (PM)	0.31	7.50	1.20
Carbon Monoxide	1.15	27.62	4.43
Reactive Organic Compounds (ROC)	0.10	2.40	0.39
GHG Emissions			<u>Metric TPY</u>
CO2			25545.04
CH4			0.4818
N2O			0.04818
CO2e			25570.09

Hourly Heat Release	62.500	MMBtu/hr
Daily Heat Release.....	1,500.000	MMBtu/day
Annual Heat Release	481,800.000	MMBtu/yr
Rule 342 Applicability	481.8	Billion Btu/yr

Press Enter to Return to the Main Menu

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid {1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6} =	4
liquid TVP =	0.5
if TVP is entered, enter TVP temperature (°F) =	180
tank heated {yes, no} =	yes
if tank is heated, enter temp (°F) =	180
vapor recovery system present? {yes, no} =	yes
is this a wash tank? {yes, no} =	no
will flashing losses occur in this tank? {yes, no} =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Attachment: E
 Permit: ATC XXXX
 Date: 01/12/16
 Tank: T-9600
 Name: Drain Tank
 Filename: ...xxxx.xls
 Distrcit: Santa Barbara
 Version: Tank-2b.xls

Tank Data	
diameter (feet) =	6
capacity (enter barrels in first col, gals will compute) =	100 4,200
conical or dome roof? {c, d} =	c
shell height (feet) =	20
roof height (def = 1):	1
ave liq height (feet):	10
color {1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh} =	4
condition {1: Good, 2: Poor} =	1
upstream pressure (psig) (def = 0 when no flashing occurs):	0

paint color	Paint Factor Matrix	
	paint condition	
	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP -4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Liquid Data		
	A	B
maximum daily throughput (bopd) =		50
Ann thruput (gal): (enter value in Column A if not max PTE)	7.665E+05	
RVP (psia):	0.09788	
°API gravity =		9

Computed Values	
roof outage ¹ (feet):	0.3
vapor space volume ² (cubic feet):	291
turnovers ³ :	182.5
turnover factor ⁴ :	0.33
paint factor ⁵ :	0.68
surface temperatures (°R, °F)	
average ⁶ :	640 180
maximum ⁷ :	641.25 181.25
minimum ⁸ :	638.75 178.75
product factor ⁹ :	0.75
diurnal vapor ranges	
temperature ¹⁰ (fahrenheit degrees):	5
vapor pressure ¹¹ (psia):	0.030783
molecular weight ¹² (lb/lb-mol):	50
TVP ¹³ (psia) [adjusted for ave liquid surface temp]:	0.5
vapor density ¹⁴ (lb/cubic foot):	0.00364
vapor expansion factor ¹⁵ :	0.006
vapor saturation factor ¹⁶ :	0.785577
vented vapor volume (scf/bbl):	8
fraction ROG - flashing losses:	0.308
fraction ROG - evaporative losses:	0.885

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	23.7
gas rvp 10	11.2
gas rvp 7	10.7
crude oil	0.5
JP -4	4.9
jet kerosene	0.0385
fuel oil 2	0.0422
fuel oil 6	0.00016

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	0.09788
JP -4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
 VRU_Eff = 95.00%
 Short-Term
 VRU_Eff = 95.00%

	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
	breathing loss ¹⁷ =	0.00	0.00	0.00	0.00	0.00
working loss ¹⁸ =	0.01	0.27	0.05	0.00	0.01	0.00
flashing loss ¹⁹ =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	0.01	0.28	0.05	0.00	0.01	0.00

NOTES: see attachment for explanation of notes (1 through 19)

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid {1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6} =	4
liquid TVP =	0.5
if TVP is entered, enter TVP temperature (°F) =	180
tank heated {yes, no} =	yes
if tank is heated, enter temp (°F) =	180
vapor recovery system present? {yes, no} =	yes
is this a wash tank? {yes, no} =	no
will flashing losses occur in this tank? {yes, no} =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Tank Data	
diameter (feet) =	6
capacity (enter barrels in first col, gals will compute) =	100 4,200
conical or dome roof? {c, d} =	c
shell height (feet) =	20
roof height (def = 1):	1
ave liq height (feet):	10
color {1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh} =	4
condition {1: Good, 2: Poor} =	1
upstream pressure (psig) (def = 0 when no flashing occurs):	0

Liquid Data		A	B
maximum daily throughput (bopd) =			50
Ann thrupt (gal): (enter value in Column A if not max PTE)		7.665E+05	
RVP (psia):		0.09788	
°API gravity =			9

Computed Values	
roof outage ¹ (feet):	0.3
vapor space volume ² (cubic feet):	291
turnovers ³ :	182.5
turnover factor ⁴ :	0.33
paint factor ⁵ :	0.68
surface temperatures (°R, °F)	
average ⁶ :	640 180
maximum ⁷ :	641.25 181.25
minimum ⁸ :	638.75 178.75
product factor ⁹ :	0.75
diurnal vapor ranges	
temperature ¹⁰ (fahrenheit degrees):	5
vapor pressure ¹¹ (psia):	0.030783
molecular weight ¹² (lb/lb-mol):	50
TVP ¹³ (psia) [adjusted for ave liquid surface temp]:	0.5
vapor density ¹⁴ (lb/cubic foot):	0.00364
vapor expansion factor ¹⁵ :	0.006
vapor saturation factor ¹⁶ :	0.785577
vented vapor volume (scf/bbl):	8
fraction ROG - flashing losses:	0.308
fraction ROG - evaporative losses:	0.885

Emissions	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss ¹⁷ =	0.00	0.00	0.00	0.00	0.00	0.00
working loss ¹⁸ =	0.01	0.27	0.05	0.00	0.01	0.00
flashing loss ¹⁹ =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	0.01	0.28	0.05	0.00	0.01	0.00

NOTES: see attachment for explanation of notes (1 through 19)

Attachment: E
 Permit: ATC XXXX
 Date: 01/12/16
 Tank: T-9560
 Name: Drain Tank
 Filename: ...xxxx.xls
 Dstrcit: Santa Barbara
 Version: Tank-2b.xls

Paint Factor Matrix		
paint color	paint condition	
	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP -4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	23.7
gas rvp 10	11.2
gas rvp 7	10.7
crude oil	0.5
JP -4	4.9
jet kerosene	0.0385
fuel oil 2	0.0422
fuel oil 6	0.00016

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	0.09788
JP -4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
 VRU_Eff = 95.00%

Short-Term
 VRU_Eff = 95.00%

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid {1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6} =	4
liquid TVP =	0.5
if TVP is entered, enter TVP temperature (°F) =	180
tank heated {yes, no} =	yes
if tank is heated, enter temp (°F) =	180
vapor recovery system present? {yes, no} =	yes
is this a wash tank? {yes, no} =	no
will flashing losses occur in this tank? {yes, no} =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Attachment: E
 Permit: ATC XXXX
 Date: 01/12/16
 Tank: T-7180
 Name: Skim Oil
 Filename: ...xxxx.xls
 Distrcit: Santa Barbara
 Version: Tank-2b.xls

Tank Data	
diameter (feet) =	21.5
capacity (enter barrels in first col, gals will compute) =	1,000 42,000
conical or dome roof? {c, d} =	c
shell height (feet) =	16
roof height (def = 1):	1
ave liq height (feet):	8
color {1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh} =	4
condition {1: Good, 2: Poor} =	1
upstream pressure (psig) (def = 0 when no flashing occurs):	0

paint color	Paint Factor Matrix	
	paint condition	
	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP -4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Liquid Data		
	A	B
maximum daily throughput (bopd) =		2,922
Ann thruput (gal): (enter value in Column A if not max P	3.806E+07	3.806E+07
RVP (psia):		0.09788
°API gravity =		9

Computed Values	
roof outage ¹ (feet):	0.3
vapor space volume ² (cubic feet):	3,013
turnovers ³ :	906.3
turnover factor ⁴ :	0.2
paint factor ⁵ :	0.68
surface temperatures (°R, °F)	
average ⁶ :	640 180
maximum ⁷ :	641.25 181.25
minimum ⁸ :	638.75 178.75
product factor ⁹ :	0.75
diurnal vapor ranges	
temperature ¹⁰ (fahrenheit degrees):	5
vapor pressure ¹¹ (psia):	0.030783
molecular weight ¹² (lb/lb-mol):	50
TVP ¹³ (psia) [adjusted for ave liquid surface temp]:	0.5
vapor density ¹⁴ (lb/cubic foot):	0.00364
vapor expansion factor ¹⁵ :	0.006
vapor saturation factor ¹⁶ :	0.819706
vented vapor volume (scf/bbl):	8
fraction ROG - flashing losses:	0.308
fraction ROG - evaporative losses:	0.885

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	23.7
gas rvp 10	11.2
gas rvp 7	10.7
crude oil	0.5
JP -4	4.9
jet kerosene	0.0385
fuel oil 2	0.0422
fuel oil 6	0.00016

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	0.09788
JP -4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
 VRU_Eff = 95.00%
 Short-Term
 VRU_Eff = 95.00%

	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
	breathing loss ¹⁷ =	0.00	0.05	0.01	0.00	0.00
working loss ¹⁸ =	0.34	8.24	1.50	0.02	0.41	0.08
flashing loss ¹⁹ =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	0.35	8.29	1.51	0.02	0.41	0.08

NOTES: see attachment for explanation of notes (1 through 19)

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid {1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6} =	4
liquid TVP =	0.5
if TVP is entered, enter TVP temperature (°F) =	180
tank heated {yes, no} =	yes
if tank is heated, enter temp (°F) =	180
vapor recovery system present? {yes, no} =	yes
is this a wash tank? {yes, no} =	no
will flashing losses occur in this tank? {yes, no} =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Attachment: E
 Permit: ATC XXXX
 Date: 01/12/16
 Tank: T-7140
 Name: Oily Sludge
 Filename: ...xxxx.xls
 Distrcit: Santa Barbara
 Version: Tank-2b.xls

Tank Data	
diameter (feet) =	21.5
capacity (enter barrels in first col, gals will compute) =	1,000 42,000
conical or dome roof? {c, d} =	c
shell height (feet) =	16
roof height (def = 1):	7
ave liq height (feet):	8
color {1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh} =	4
condition {1: Good, 2: Poor} =	1
upstream pressure (psig) (def = 0 when no flashing occurs):	0

paint color	Paint Factor Matrix	
	paint condition	
	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP -4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Liquid Data		
	A	B
maximum daily throughput (bopd) =		803
Ann thruput (gal): (enter value in Column A if not max P	9.828E+06	9.828E+06
RVP (psia):		0.09788
°API gravity =		9

Computed Values	
roof outage ¹ (feet):	2.3
vapor space volume ² (cubic feet):	3,739
turnovers ³ :	234
turnover factor ⁴ :	0.29
paint factor ⁵ :	0.68
surface temperatures (°R, °F)	
average ⁶ :	640 180
maximum ⁷ :	641.25 181.25
minimum ⁸ :	638.75 178.75
product factor ⁹ :	0.75
diurnal vapor ranges	
temperature ¹⁰ (fahrenheit degrees):	5
vapor pressure ¹¹ (psia):	0.030783
molecular weight ¹² (lb/lb-mol):	50
TVP ¹³ (psia) [adjusted for ave liquid surface temp]:	0.5
vapor density ¹⁴ (lb/cubic foot):	0.00364
vapor expansion factor ¹⁵ :	0.006
vapor saturation factor ¹⁶ :	0.785577
vented vapor volume (scf/bbl):	8
fraction ROG - flashing losses:	0.308
fraction ROG - evaporative losses:	0.885

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	23.7
gas rvp 10	11.2
gas rvp 7	10.7
crude oil	0.5
JP -4	4.9
jet kerosene	0.0385
fuel oil 2	0.0422
fuel oil 6	0.00016

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	0.09788
JP -4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
 VRU_Eff = 95.00%
 Short-Term
 VRU_Eff = 95.00%

Emissions	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss ¹⁷ =	0.00	0.06	0.01	0.00	0.00	0.00
working loss ¹⁸ =	0.13	3.09	0.56	0.01	0.15	0.03
flashing loss ¹⁹ =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	0.13	3.14	0.57	0.01	0.16	0.03

NOTES: see attachment for explanation of notes (1 through 19)

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid {1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6} =	4
liquid TVP =	0.5
if TVP is entered, enter TVP temperature (°F) =	180
tank heated {yes, no} =	yes
if tank is heated, enter temp (°F) =	180
vapor recovery system present? {yes, no} =	yes
is this a wash tank? {yes, no} =	no
will flashing losses occur in this tank? {yes, no} =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Tank Data	
diameter (feet) =	21.5
capacity (enter barrels in first col, gals will compute) =	1,000 42,000
conical or dome roof? {c, d} =	c
shell height (feet) =	16
roof height (def = 1):	1
ave liq height (feet):	8
color {1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh} =	4
condition {1: Good, 2: Poor} =	1
upstream pressure (psig) (def = 0 when no flashing occurs):	0

Liquid Data		
	A	B
maximum daily throughput (bopd) =		2,922
Ann thrupt (gal): (enter value in Column A if not max P	3.806E+07	3.806E+07
RVP (psia):		0.09788
°API gravity =		9

Computed Values	
roof outage ¹ (feet):	0.3
vapor space volume ² (cubic feet):	3,013
turnovers ³ :	906.3
turnover factor ⁴ :	0.2
paint factor ⁵ :	0.68
surface temperatures (°R, °F)	
average ⁶ :	640 180
maximum ⁷ :	641.25 181.25
minimum ⁸ :	638.75 178.75
product factor ⁹ :	0.75
diurnal vapor ranges	
temperature ¹⁰ (fahrenheit degrees):	5
vapor pressure ¹¹ (psia):	0.030783
molecular weight ¹² (lb/lb-mol):	50
TVP ¹³ (psia) [adjusted for ave liquid surface temp]:	0.5
vapor density ¹⁴ (lb/cubic foot):	0.00364
vapor expansion factor ¹⁵ :	0.006
vapor saturation factor ¹⁶ :	0.819706
vented vapor volume (scf/bbl):	8
fraction ROG - flashing losses:	0.308
fraction ROG - evaporative losses:	0.885

	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss ¹⁷ =	0.00	0.05	0.01	0.00	0.00	0.00
working loss ¹⁸ =	0.34	8.24	1.50	0.02	0.41	0.08
flashing loss ¹⁹ =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	0.35	8.29	1.51	0.02	0.41	0.08

NOTES: see attachment for explanation of notes (1 through 19)

Attachment: E
 Permit: ATC XXXX
 Date: 01/12/16
 Tank: T-7070
 Name: Skim Oil
 Filename: ...xxxx.xls
 Distrcit: Santa Barbara
 Version: Tank-2b.xls

Paint Factor Matrix		
paint color	paint condition	
	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP -4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	23.7
gas rvp 10	11.2
gas rvp 7	10.7
crude oil	0.5
JP -4	4.9
jet kerosene	0.0385
fuel oil 2	0.0422
fuel oil 6	0.00016

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	0.09788
JP -4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
 VRU_Eff = 95.00%

Short-Term
 VRU_Eff = 95.00%

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid {1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6} =	4
liquid TVP =	0.5
if TVP is entered, enter TVP temperature (°F) =	180
tank heated {yes, no} =	yes
if tank is heated, enter temp (°F) =	180
vapor recovery system present? {yes, no} =	yes
is this a wash tank? {yes, no} =	no
will flashing losses occur in this tank? {yes, no} =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Attachment: E
 Permit: ATC XXXX
 Date: 01/12/16
 Tank: T-7030
 Name: Oily Sludge
 Filename: ...xxxx.xls
 Distrcit: Santa Barbara
 Version: Tank-2b.xls

Tank Data	
diameter (feet) =	21.5
capacity (enter barrels in first col, gals will compute) =	1,000 42,000
conical or dome roof? {c, d} =	c
shell height (feet) =	16
roof height (def = 1):	7
ave liq height (feet):	8
color {1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh} =	4
condition {1: Good, 2: Poor} =	1
upstream pressure (psig) (def = 0 when no flashing occurs):	0

paint color	Paint Factor Matrix	
	paint condition	
	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP -4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Liquid Data		
	A	B
maximum daily throughput (bopd) =		803
Ann thrupt (gal): (enter value in Column A if not max P	9.828E+06	9.828E+06
RVP (psia):		0.09788
°API gravity =		9

Computed Values	
roof outage ¹ (feet):	2.3
vapor space volume ² (cubic feet):	3,739
turnovers ³ :	234
turnover factor ⁴ :	0.29
paint factor ⁵ :	0.68
surface temperatures (°R, °F)	
average ⁶ :	640 180
maximum ⁷ :	641.25 181.25
minimum ⁸ :	638.75 178.75
product factor ⁹ :	0.75
diurnal vapor ranges	
temperature ¹⁰ (fahrenheit degrees):	5
vapor pressure ¹¹ (psia):	0.030783
molecular weight ¹² (lb/lb-mol):	50
TVP ¹³ (psia) [adjusted for ave liquid surface temp]:	0.5
vapor density ¹⁴ (lb/cubic foot):	0.00364
vapor expansion factor ¹⁵ :	0.006
vapor saturation factor ¹⁶ :	0.785577
vented vapor volume (scf/bbl):	8
fraction ROG - flashing losses:	0.308
fraction ROG - evaporative losses:	0.885

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	23.7
gas rvp 10	11.2
gas rvp 7	10.7
crude oil	0.5
JP -4	4.9
jet kerosene	0.0385
fuel oil 2	0.0422
fuel oil 6	0.00016

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	0.09788
JP -4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
 VRU_Eff = 95.00%
 Short-Term
 VRU_Eff = 95.00%

Emissions	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss ¹⁷ =	0.00	0.06	0.01	0.00	0.00	0.00
working loss ¹⁸ =	0.13	3.09	0.56	0.01	0.15	0.03
flashing loss ¹⁹ =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	0.13	3.14	0.57	0.01	0.16	0.03

NOTES: see attachment for explanation of notes (1 through 19)

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid {1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6} =	4
liquid TVP =	0.5
if TVP is entered, enter TVP temperature (°F) =	200
tank heated {yes, no} =	yes
if tank is heated, enter temp (°F) =	200
vapor recovery system present? {yes, no} =	yes
is this a wash tank? {yes, no} =	no
will flashing losses occur in this tank? {yes, no} =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Attachment: E
 Permit: ATC XXXX
 Date: 01/12/16
 Tank: T-2180
 Name: HCO Storage
 Filename: ...xxxx.xls
 Distrcit: Santa Barbara
 Version: Tank-2b.xls

Tank Data	
diameter (feet) =	55
capacity (enter barrels in first col, gals will compute) =	10,000 420,000
conical or dome roof? {c, d} =	c
shell height (feet) =	24
roof height (def = 1):	1
ave liq height (feet):	12
color {1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh} =	4
condition {1: Good, 2: Poor} =	1
upstream pressure (psig) (def = 0 when no flashing occurs):	0

paint color	Paint Factor Matrix	
	paint condition	
	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP -4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Liquid Data		
	A	B
maximum daily throughput (bopd) =		10,140
Ann thruput (gal): (enter value in Column A if not max P	1.244E+08	1.244E+08
RVP (psia):		0.05672
°API gravity =		12

Computed Values	
roof outage ¹ (feet):	0.3
vapor space volume ² (cubic feet):	29,223
turnovers ³ :	296.1
turnover factor ⁴ :	0.27
paint factor ⁵ :	0.68
surface temperatures (°R, °F)	
average ⁶ :	660 200
maximum ⁷ :	661.25 201.25
minimum ⁸ :	658.75 198.75
product factor ⁹ :	0.75
diurnal vapor ranges	
temperature ¹⁰ (fahrenheit degrees):	5
vapor pressure ¹¹ (psia):	0.030851
molecular weight ¹² (lb/lb-mol):	50
TVP ¹³ (psia) [adjusted for ave liquid surface temp]:	0.50003
vapor density ¹⁴ (lb/cubic foot):	0.00353
vapor expansion factor ¹⁵ :	0.006
vapor saturation factor ¹⁶ :	0.754165
vented vapor volume (scf/bbl):	8
fraction ROG - flashing losses:	0.308
fraction ROG - evaporative losses:	0.885

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	26.5
gas rvp 10	12.2
gas rvp 7	11.9
crude oil	0.50003
JP -4	5.5
jet kerosene	0.0435
fuel oil 2	0.048
fuel oil 6	0.00018

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	0.056716
JP -4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
 VRU_Eff = 95.00%
 Short-Term
 VRU_Eff = 95.00%

	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss ¹⁷ =	0.02	0.41	0.08	0.00	0.02	0.00
working loss ¹⁸ =	1.51	36.35	6.63	0.08	1.82	0.33
flashing loss ¹⁹ =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	1.53	36.76	6.71	0.08	1.84	0.34

NOTES: see attachment for explanation of notes (1 through 19)

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid {1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6} =	4
liquid TVP =	0.5
if TVP is entered, enter TVP temperature (°F) =	200
tank heated {yes, no} =	yes
if tank is heated, enter temp (°F) =	200
vapor recovery system present? {yes, no} =	yes
is this a wash tank? {yes, no} =	no
will flashing losses occur in this tank? {yes, no} =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Attachment: E
 Permit: ATC XXXX
 Date: 01/12/16
 Tank: T-2170
 Name: HCO Storage
 Filename: ...xxxx.xls
 Distrcit: Santa Barbara
 Version: Tank-2b.xls

Tank Data	
diameter (feet) =	55
capacity (enter barrels in first col, gals will compute) =	10,000 420,000
conical or dome roof? {c, d} =	c
shell height (feet) =	24
roof height (def = 1):	1
ave liq height (feet):	12
color {1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh} =	4
condition {1: Good, 2: Poor} =	1
upstream pressure (psig) (def = 0 when no flashing occurs):	0

paint color	Paint Factor Matrix	
	paint condition	
	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP -4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Liquid Data		
	A	B
maximum daily throughput (bopd) =		10,140
Ann thruput (gal): (enter value in Column A if not max P	1.244E+08	1.244E+08
RVP (psia):		0.05672
°API gravity =		12

Computed Values	
roof outage ¹ (feet):	0.3
vapor space volume ² (cubic feet):	29,223
turnovers ³ :	296.1
turnover factor ⁴ :	0.27
paint factor ⁵ :	0.68
surface temperatures (°R, °F)	
average ⁶ :	660 200
maximum ⁷ :	661.25 201.25
minimum ⁸ :	658.75 198.75
product factor ⁹ :	0.75
diurnal vapor ranges	
temperature ¹⁰ (fahrenheit degrees):	5
vapor pressure ¹¹ (psia):	0.030851
molecular weight ¹² (lb/lb-mol):	50
TVP ¹³ (psia) [adjusted for ave liquid surface temp]:	0.50003
vapor density ¹⁴ (lb/cubic foot):	0.00353
vapor expansion factor ¹⁵ :	0.006
vapor saturation factor ¹⁶ :	0.754165
vented vapor volume (scf/bbl):	8
fraction ROG - flashing losses:	0.308
fraction ROG - evaporative losses:	0.885

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	26.5
gas rvp 10	12.2
gas rvp 7	11.9
crude oil	0.50003
JP -4	5.5
jet kerosene	0.0435
fuel oil 2	0.048
fuel oil 6	0.00018

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	0.056716
JP -4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
 VRU_Eff = 95.00%
 Short-Term
 VRU_Eff = 95.00%

Emissions	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss ¹⁷ =	0.02	0.41	0.08	0.00	0.02	0.00
working loss ¹⁸ =	1.51	36.35	6.63	0.08	1.82	0.33
flashing loss ¹⁹ =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	1.53	36.76	6.71	0.08	1.84	0.34

NOTES: see attachment for explanation of notes (1 through 19)

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid {1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6} =	4
liquid TVP =	1.57
if TVP is entered, enter TVP temperature (°F) =	60
tank heated {yes, no} =	no
if tank is heated, enter temp (°F) =	
vapor recovery system present? {yes, no} =	yes
is this a wash tank? {yes, no} =	no
will flashing losses occur in this tank? {yes, no} =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Attachment: E
 Permit: ATC XXXX
 Date: 01/12/16
 Tank: T-2050
 Name: LCO Storage
 Filename: ...xxxx.xls
 Distrcit: Santa Barbara
 Version: Tank-2b.xls

Tank Data	
diameter (feet) =	44
capacity (enter barrels in first col, gals will compute) =	6,500 273,000
conical or dome roof? {c, d} =	c
shell height (feet) =	24
roof height (def = 1):	1
ave liq height (feet):	12
color {1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh} =	4
condition {1: Good, 2: Poor} =	1
upstream pressure (psig) (def = 0 when no flashing occurs):	0

Paint Factor Matrix		
paint color	paint condition	
	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP -4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Liquid Data		
	A	B
maximum daily throughput (bopd) =		3,000
Ann thruput (gal): (enter value in Column A if not max P	3.062E+07	3.062E+07
RVP (psia):		3.19896
°API gravity =		29

Computed Values	
roof outage ¹ (feet):	0.3
vapor space volume ² (cubic feet):	18,703
turnovers ³ :	112.15
turnover factor ⁴ :	0.43
paint factor ⁵ :	0.68
surface temperatures (°R, °F)	
average ⁶ :	527.2 67.2
maximum ⁷ :	539 79
minimum ⁸ :	515.4 55.4
product factor ⁹ :	0.75
diurnal vapor ranges	
temperature ¹⁰ (fahrenheit degrees):	47.2
vapor pressure ¹¹ (psia):	0.908836
molecular weight ¹² (lb/lb-mol):	50
TVP ¹³ (psia) [adjusted for ave liquid surface temp]:	1.83059
vapor density ¹⁴ (lb/cubic foot):	0.016179
vapor expansion factor ¹⁵ :	0.155
vapor saturation factor ¹⁶ :	0.455921
vented vapor volume (scf/bbl):	100
fraction ROG - flashing losses:	0.308
fraction ROG - evaporative losses:	0.885

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	7.908
gas rvp 10	5.56
gas rvp 7	3.932
crude oil	1.83059
JP -4	1.516
jet kerosene	0.0103
fuel oil 2	0.009488
fuel oil 6	0.0000472

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	3.198957
JP -4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
 VRU_Eff = 95.00%

 Short-Term
 VRU_Eff = 95.00%

Emissions	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss ¹⁷ =	0.79	18.92	3.45	0.04	0.95	0.17
working loss ¹⁸ =	2.17	52.18	9.52	0.11	2.61	0.48
flashing loss ¹⁹ =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	2.96	71.10	12.98	0.15	3.56	0.65

NOTES: see attachment for explanation of notes (1 through 19)

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid {1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6} =	4
liquid TVP =	1.57
if TVP is entered, enter TVP temperature (°F) =	60
tank heated (yes, no) =	no
if tank is heated, enter temp (°F) =	
vapor recovery system present? (yes, no) =	yes
is this a wash tank? (yes, no) =	no
will flashing losses occur in this tank? (yes, no) =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Attachment: E
 Permit: ATC XXXX
 Date: 01/12/16
 Tank: T-2040
 Name: LCO Storage
 Filename: ..\xxxx.xls
 District: Santa Barbara
 Version: Tank-2b.xls

Tank Data	
diameter (feet) =	44
capacity (enter barrels in first col, gals will compute) =	6,500 273,000
conical or dome roof? (c, d) =	c
shell height (feet) =	24
roof height (def = 1):	1
ave liq height (feet):	12
color {1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh} =	4
condition {1: Good, 2: Poor} =	1
upstream pressure (psig) (def = 0 when no flashing occurs):	0

Paint Factor Matrix		
paint color	paint condition	
	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP -4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Liquid Data		
	A	B
maximum daily throughput (bopd) =		3,000
Ann thruput (gal): (enter value in Column A if not max P	3.062E+07	3.062E+07
RVP (psia):		3.19896
°API gravity =		29

Computed Values	
roof outage ¹ (feet):	0.3
vapor space volume ² (cubic feet):	18,703
turnovers ³ :	112.15
turnover factor ⁴ :	0.43
paint factor ⁵ :	0.68
surface temperatures (°R, °F)	
average ⁶ :	527.2 67.2
maximum ⁷ :	539 79
minimum ⁸ :	515.4 55.4
product factor ⁹ :	0.75
diurnal vapor ranges	
temperature ¹⁰ (fahrenheit degrees):	47.2
vapor pressure ¹¹ (psia):	0.908836
molecular weight ¹² (lb/lb-mol):	50
TVP ¹³ (psia) [adjusted for ave liquid surface temp]:	1.83059
vapor density ¹⁴ (lb/cubic foot):	0.016179
vapor expansion factor ¹⁵ :	0.155
vapor saturation factor ¹⁶ :	0.455921
vented vapor volume (scf/bbl):	8
fraction ROG - flashing losses:	0.308
fraction ROG - evaporative losses:	0.885

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	7.908
gas rvp 10	5.56
gas rvp 7	3.932
crude oil	1.83059
JP -4	1.516
jet kerosene	0.0103
fuel oil 2	0.009488
fuel oil 6	0.0000472

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	3.198957
JP -4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
 VRU_Eff = 95.00%

Short-Term
 VRU_Eff = 95.00%

Emissions	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss ¹⁷ =	0.79	18.92	3.45	0.04	0.95	0.17
working loss ¹⁸ =	2.17	52.18	9.52	0.11	2.61	0.48
flashing loss ¹⁹ =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	2.96	71.10	12.98	0.15	3.56	0.65

NOTES: see attachment for explanation of notes (1 through 19)

Electrical Generation Greenhouse Gas Emissions

□ Operating Indirect Electrical Generation Emissions

Operating Indirect Electrical Generation Emissions

Process	Emission Factor (lbs/MWh)	Peak Year (MWh/day)	Peak Year (MWh/year)	Emissions (lbs/year)	GWP	CO2e (lbs/Year)	CO2e (MT/Year)
Indirect Electrical Generation N2O	0.006	288	105120	631	310	195523	88.7
Indirect Electrical Generation CH4	0.029	288	105120	3048	21	64018	29.0
Indirect Electrical Generation CO2	641.35	288	105120	67418712	1	67418712	30580.6
						Total:	30,698.3

- 1) Emission Factors Obtained from CalEEMod for PG&E for Santa Barbara County.
- 2) Estimated 12 MW substation.

Emission Summaries

- ▣ Construction Emissions Summaries
- x Operational Emissions Summaries

AERA - Santa Barbara County - Cat Canyon - ECC Project

Construction Emission Summary

Unmitigated

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
Project Construction Activities										
2017	1.89	9.64	23.78	0.02	3.02	1.09	0.01	0.67	2,229.42	2,246.65
2018	3.85	21.71	37.78	0.04	18.95	3.32	0.09	1.29	4,435.47	4,489.95
2019	5.47	32.26	50.06	0.06	30.84	5.11	0.15	1.71	5,973.58	6,055.54
2020	0.75	4.35	8.12	0.01	2.37	0.52	0.01	0.29	923.46	932.80
2021	0.66	4.12	7.06	0.01	2.22	0.47	0.01	0.27	870.36	879.19
2022	0.28	1.64	3.10	0.01	0.81	0.18	0.00	0.15	458.40	462.62
2023	1.12	8.82	9.49	0.02	10.56	1.40	0.05	0.50	1,755.47	1,782.39
2024	3.42	25.37	31.65	0.06	15.91	2.69	0.07	1.74	5,749.59	5,809.29
2025	0.01	0.06	0.10	0.00	0.13	0.02	0.00	0.01	18.95	19.28
2026	0.26	2.06	2.36	0.01	0.75	0.16	0.00	0.14	464.27	468.34
2027	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2028	0.22	1.50	2.13	0.00	0.71	0.14	0.00	0.14	446.28	450.33
2029	0.11	0.79	1.01	0.00	0.40	0.07	0.00	0.05	175.33	177.00
2030	0.27	2.16	1.07	0.01	1.08	0.14	0.01	0.03	608.21	610.48
2031	0.36	2.59	1.43	0.01	1.26	0.17	0.01	0.04	805.94	808.61
2032	0.11	0.98	0.45	0.00	0.33	0.04	0.00	0.01	231.76	232.49
2033	0.00	0.02	0.01	0.00	0.06	0.01	0.00	0.00	10.57	10.68
2034	0.23	1.51	0.93	0.01	0.43	0.07	0.00	0.02	502.03	503.11
2035	0.71	5.86	2.23	0.02	3.13	0.38	0.02	0.07	1,799.36	1,805.79
2036	0.00	0.02	0.01	0.00	0.06	0.01	0.00	0.00	10.54	10.65
2037	0.00	0.02	0.01	0.00	0.06	0.01	0.00	0.00	10.53	10.65
14-Mile Fuel Line Construction Activities										
2018	3.46	24.44	36.67	0.04	7.81	2.28	0.03	1.14	4,006.06	4,049.89
115KV Interconnect and Substation Construction Activities										
2017	0.13	0.76	1.09	0.00	0.55	0.11	0.00	0.03	105.40	106.81

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Drilling and Hookup Construction Activities										
2017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018	0.23	1.20	2.57	0.00	1.08	0.18	0.01	0.04	535.79	538.28
2019	3.40	18.48	36.25	0.08	7.37	1.72	0.03	0.59	8,355.95	8,378.02
2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2021	0.07	0.44	0.08	0.00	0.52	0.07	0.00	0.02	200.81	201.93
2022	0.07	0.46	0.62	0.00	0.51	0.07	0.00	0.02	213.76	214.90
2023	0.07	0.45	0.55	0.00	0.51	0.07	0.00	0.02	213.37	214.51
2024	2.71	18.32	20.58	0.08	6.92	1.26	0.03	0.56	8,813.83	8,835.31
2025	0.11	0.83	0.80	0.00	1.03	0.12	0.01	0.03	400.25	402.48
2026	0.44	3.12	3.07	0.01	2.63	0.34	0.01	0.10	1,504.60	1,510.81
2027	0.18	1.25	1.24	0.01	1.04	0.14	0.01	0.04	603.40	605.87
2028	0.15	1.07	1.05	0.00	1.03	0.13	0.01	0.04	514.32	516.68
2029	0.40	2.84	2.82	0.01	2.11	0.29	0.01	0.09	1,373.84	1,379.02
2030	0.52	4.22	2.01	0.02	3.11	0.37	0.02	0.06	2,193.47	2,199.53
2031	0.35	2.87	1.37	0.01	2.09	0.25	0.01	0.04	1,495.63	1,499.71
2032	0.39	3.15	1.50	0.02	2.54	0.30	0.01	0.04	1,637.89	1,642.81
2033	0.13	1.04	0.49	0.01	1.01	0.11	0.01	0.02	538.37	540.29
2034	0.44	3.55	1.69	0.02	2.58	0.30	0.01	0.05	1,846.70	1,851.74
2035	0.88	7.67	2.59	0.04	5.61	0.63	0.03	0.10	4,000.30	4,011.19
2036	0.17	1.44	0.49	0.01	1.04	0.12	0.01	0.02	748.19	750.21
2037	0.17	1.44	0.49	0.01	1.04	0.12	0.01	0.02	748.05	750.07
2038	0.17	1.44	0.49	0.01	1.02	0.12	0.01	0.02	747.69	749.67
2039	0.17	1.43	0.49	0.01	1.00	0.11	0.01	0.02	747.35	749.30
2040	0.16	1.43	0.42	0.01	1.02	0.11	0.01	0.02	747.53	749.51
2041	0.16	1.43	0.42	0.01	1.02	0.11	0.01	0.02	747.47	749.45
2042	0.16	1.43	0.42	0.01	1.04	0.11	0.01	0.02	747.67	749.69
2043	0.16	1.43	0.42	0.01	1.04	0.11	0.01	0.02	747.64	749.65
2044	0.16	1.43	0.42	0.01	1.02	0.11	0.01	0.02	747.36	749.35
2045	0.16	1.43	0.42	0.01	1.02	0.11	0.01	0.02	747.34	749.32
2046	0.16	1.43	0.42	0.01	1.02	0.11	0.01	0.02	747.32	749.31
2047	0.16	1.43	0.42	0.01	1.02	0.11	0.01	0.02	747.31	749.29
2048	0.16	1.43	0.42	0.01	1.04	0.11	0.01	0.02	747.55	749.56
2049	0.16	1.43	0.42	0.01	1.02	0.11	0.01	0.02	747.29	749.27

AERA - Santa Barbara County - Cat Canyon - ECC Project

Replacement Well Drilling and Hookup Construction Activities										
2019	0.04	0.22	0.45	0.00	0.07	0.02	0.00	0.01	101.56	101.79
2020	0.04	0.22	0.39	0.00	0.06	0.02	0.00	0.01	101.25	101.48
2021	0.03	0.22	0.34	0.00	0.06	0.02	0.00	0.01	101.21	101.43
2022	0.03	0.21	0.30	0.00	0.06	0.01	0.00	0.01	101.15	101.37
2023	0.03	0.21	0.26	0.00	0.06	0.01	0.00	0.01	101.12	101.34
2024	0.03	0.21	0.24	0.00	0.06	0.01	0.00	0.01	101.10	101.31
2025	0.03	0.21	0.21	0.00	0.06	0.01	0.00	0.01	101.06	101.27
2026	0.03	0.21	0.21	0.00	0.06	0.01	0.00	0.01	101.03	101.24
2027	0.03	0.21	0.21	0.00	0.06	0.01	0.00	0.01	101.00	101.22
2028	0.03	0.21	0.21	0.00	0.06	0.01	0.00	0.01	103.31	101.20
2029	0.03	0.21	0.21	0.00	0.06	0.01	0.00	0.00	103.29	101.17
2030	0.03	0.20	0.09	0.00	0.06	0.01	0.00	0.00	103.27	103.40
2031	0.03	0.20	0.09	0.00	0.06	0.01	0.00	0.00	103.25	103.38
2032	0.03	0.20	0.09	0.00	0.06	0.01	0.00	0.00	103.24	103.36
2033	0.03	0.20	0.09	0.00	0.06	0.01	0.00	0.00	103.23	103.35
2034	0.03	0.20	0.09	0.00	0.06	0.01	0.00	0.00	103.21	103.34
2035	0.02	0.20	0.07	0.00	0.05	0.01	0.00	0.00	103.20	103.33
2036	0.02	0.20	0.07	0.00	0.05	0.01	0.00	0.00	103.20	103.32
2037	0.02	0.20	0.07	0.00	0.05	0.01	0.00	0.00	103.19	103.32
2038	0.02	0.20	0.07	0.00	0.05	0.01	0.00	0.00	103.18	103.31
2039	0.02	0.20	0.07	0.00	0.05	0.01	0.00	0.00	103.18	103.31
2040	0.02	0.20	0.06	0.00	0.05	0.01	0.00	0.00	103.18	103.30
2041	0.02	0.20	0.06	0.00	0.05	0.01	0.00	0.00	103.17	103.30
2042	0.02	0.20	0.06	0.00	0.05	0.01	0.00	0.00	103.17	103.30
2043	0.02	0.20	0.06	0.00	0.05	0.01	0.00	0.00	103.17	103.30
2044	0.02	0.20	0.06	0.00	0.05	0.01	0.00	0.00	103.17	103.30
2045	0.02	0.20	0.06	0.00	0.05	0.01	0.00	0.00	103.17	103.30
2046	0.02	0.20	0.06	0.00	0.05	0.01	0.00	0.00	103.17	103.29
2047	0.02	0.20	0.06	0.00	0.05	0.01	0.00	0.00	103.17	103.29
2048	0.02	0.20	0.06	0.00	0.05	0.01	0.00	0.00	103.17	103.29

AERA - Santa Barbara County - Cat Canyon - ECC Project

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
Total Unmitigated Construction Activities										
2017	2.02	10.39	24.88	0.02	3.56	1.19	0.01	0.70	2,334.82	2,353.46
2018	4.08	47.35	77.02	0.09	27.84	5.78	0.13	2.48	8,977.32	9,078.12
2019	8.92	50.96	86.76	0.14	38.28	6.85	0.18	2.31	14,431.10	14,535.36
2020	0.79	4.57	8.52	0.01	2.44	0.54	0.01	0.30	1,024.72	1,034.28
2021	0.76	4.78	7.49	0.01	2.80	0.55	0.01	0.29	1,172.38	1,182.54
2022	0.38	2.31	4.02	0.01	1.39	0.26	0.01	0.17	773.31	778.89
2023	1.22	9.49	10.30	0.02	11.13	1.48	0.06	0.53	2,069.96	2,098.23
2024	6.16	43.90	52.47	0.15	22.89	3.96	0.11	2.30	14,664.51	14,745.91
2025	0.15	1.10	1.12	0.00	1.22	0.15	0.01	0.04	520.26	523.04
2026	0.73	5.39	5.65	0.02	3.44	0.51	0.02	0.25	2,069.90	2,080.40
2027	0.21	1.46	1.45	0.01	1.09	0.15	0.01	0.05	704.40	707.09
2028	0.40	2.78	3.40	0.01	1.79	0.28	0.01	0.19	1,063.90	1,068.21
2029	0.54	3.84	4.04	0.02	2.57	0.37	0.01	0.15	1,652.45	1,657.19
2030	0.82	6.58	3.18	0.03	4.24	0.51	0.02	0.09	2,904.95	2,913.41
2031	0.74	5.66	2.89	0.02	3.40	0.42	0.02	0.08	2,404.83	2,411.71
2032	0.52	4.33	2.04	0.02	2.93	0.35	0.01	0.06	1,972.88	1,978.67
2033	0.16	1.26	0.60	0.01	1.13	0.13	0.01	0.02	652.16	654.33
2034	0.70	5.25	2.72	0.02	3.07	0.38	0.02	0.07	2,451.94	2,458.19
2035	1.61	13.73	4.89	0.06	8.79	1.02	0.04	0.17	5,902.86	5,920.31
2036	0.19	1.66	0.57	0.01	1.15	0.13	0.01	0.02	861.92	864.18
2037	0.19	1.66	0.57	0.01	1.15	0.13	0.01	0.02	861.77	864.03
2038	0.19	1.64	0.56	0.01	1.07	0.12	0.01	0.02	850.87	852.98
2039	0.19	1.64	0.56	0.01	1.05	0.12	0.01	0.02	850.53	852.60
2040	0.18	1.64	0.48	0.01	1.07	0.12	0.01	0.02	850.70	852.81
2041	0.18	1.64	0.48	0.01	1.07	0.12	0.01	0.02	850.65	852.76
2042	0.18	1.64	0.48	0.01	1.09	0.12	0.01	0.02	850.85	852.99
2043	0.18	1.64	0.48	0.01	1.09	0.12	0.01	0.02	850.81	852.95
2044	0.18	1.63	0.48	0.01	1.07	0.12	0.01	0.02	850.53	852.64
2045	0.18	1.63	0.48	0.01	1.07	0.12	0.01	0.02	850.51	852.62
2046	0.18	1.63	0.48	0.01	1.07	0.12	0.01	0.02	850.49	852.60
2047	0.18	1.63	0.48	0.01	1.07	0.12	0.01	0.02	850.48	852.59
2048	0.18	1.63	0.48	0.01	1.09	0.12	0.01	0.02	850.71	852.86
2049	0.16	1.43	0.42	0.01	1.02	0.11	0.01	0.02	747.29	749.27
Peak	8.92	50.96	86.76	0.15	38.28	6.85	0.18	2.48	14,664.51	14,745.91

AERA - Santa Barbara County - Cat Canyon - ECC Project

Construction Emission Summary

Mitigated

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
Project Construction Activities										
2017	0.29	11.59	1.30	0.02	0.55	0.09	0.01	0.67	2,229.41	2,246.65
2018	0.63	23.76	6.16	0.04	4.20	0.49	0.09	1.29	4,435.47	4,489.94
2019	0.89	34.33	9.79	0.06	6.93	0.81	0.15	1.71	5,973.58	6,055.54
2020	0.13	5.41	0.82	0.01	0.50	0.07	0.01	0.29	923.46	932.80
2021	0.12	5.20	0.81	0.01	0.47	0.06	0.01	0.27	870.36	879.19
2022	0.06	2.46	0.28	0.01	0.17	0.02	0.00	0.15	458.39	462.62
2023	0.25	10.03	2.64	0.02	2.45	0.27	0.05	0.50	1,755.46	1,782.39
2024	0.82	33.07	6.44	0.06	3.71	0.46	0.07	1.74	5,749.59	5,809.28
2025	0.00	0.09	0.01	0.00	0.03	0.00	0.00	0.01	18.95	19.28
2026	0.07	2.81	0.46	0.01	0.16	0.02	0.00	0.14	464.27	468.34
2027	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2028	0.06	2.40	0.27	0.00	0.16	0.02	0.00	0.14	446.28	450.33
2029	0.03	1.03	0.20	0.00	0.09	0.01	0.00	0.05	175.33	177.00
2030	0.07	3.11	0.52	0.01	0.26	0.03	0.01	0.03	608.21	610.48
2031	0.10	3.94	0.60	0.01	0.31	0.04	0.01	0.04	805.94	808.61
2032	0.03	1.29	0.25	0.00	0.08	0.01	0.00	0.01	231.76	232.49
2033	0.00	0.04	0.01	0.00	0.01	0.00	0.00	0.00	10.57	10.68
2034	0.06	2.38	0.37	0.01	0.10	0.02	0.00	0.02	502.03	503.11
2035	0.22	8.91	1.33	0.02	0.77	0.10	0.02	0.07	1,799.36	1,805.79
2036	0.00	0.04	0.01	0.00	0.01	0.00	0.00	0.00	10.54	10.65
2037	0.00	0.04	0.01	0.00	0.01	0.00	0.00	0.00	10.53	10.65
14-Mile Fuel Line Construction Activities										
2018	0.53	24.90	2.89	0.04	1.50	0.21	0.03	1.14	4,006.06	4,039.89
115KV Interconnect and Substation Construction Activities										
2017	0.02	0.66	0.18	0.00	0.12	0.01	0.00	0.03	105.40	103.81

AERA - Santa Barbara County - Cat Canyon - ECC Project

Drilling and Hookup Construction Activities										
2017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018	0.06	2.23	0.33	0.00	0.25	0.03	0.01	0.04	535.79	538.28
2019	0.98	35.62	5.01	0.08	1.62	0.28	0.03	0.59	8,355.94	8,378.02
2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2021	0.02	0.85	0.12	0.00	0.12	0.01	0.00	0.02	200.81	201.93
2022	0.02	0.91	0.12	0.00	0.12	0.02	0.00	0.02	213.76	214.90
2023	0.02	0.90	0.11	0.00	0.12	0.02	0.00	0.02	213.37	214.51
2024	1.03	37.70	4.75	0.08	1.64	0.29	0.03	0.56	8,823.82	8,835.30
2025	0.05	1.69	0.21	0.00	0.25	0.03	0.01	0.03	400.25	402.48
2026	0.17	6.39	0.80	0.01	0.63	0.08	0.01	0.10	1,504.60	1,510.81
2027	0.07	2.57	0.32	0.01	0.25	0.03	0.01	0.04	603.40	605.87
2028	0.06	2.18	0.27	0.00	0.25	0.03	0.01	0.04	514.32	516.68
2029	0.16	5.85	0.73	0.01	0.50	0.07	0.01	0.09	1,373.84	1,379.01
2030	0.25	9.13	1.14	0.02	0.76	0.11	0.02	0.06	2,193.47	2,199.53
2031	0.17	6.23	0.78	0.01	0.51	0.07	0.01	0.04	1,495.63	1,499.71
2032	0.19	6.81	0.85	0.02	0.62	0.08	0.01	0.04	1,637.89	1,642.81
2033	0.06	2.23	0.28	0.01	0.25	0.03	0.01	0.02	538.37	540.29
2034	0.21	7.69	0.96	0.02	0.63	0.09	0.01	0.05	1,846.70	1,851.74
2035	0.45	16.67	2.06	0.04	1.38	0.19	0.03	0.10	4,000.29	4,011.18
2036	0.08	3.12	0.39	0.01	0.26	0.04	0.01	0.02	748.19	750.20
2037	0.08	3.12	0.39	0.01	0.26	0.04	0.01	0.02	748.05	750.07
2038	0.08	3.11	0.39	0.01	0.25	0.04	0.01	0.02	747.68	749.67
2039	0.08	3.11	0.39	0.01	0.25	0.03	0.01	0.02	747.34	749.30
2040	0.08	3.11	0.39	0.01	0.25	0.04	0.01	0.02	747.53	749.51
2041	0.08	3.11	0.39	0.01	0.25	0.04	0.01	0.02	747.47	749.45
2042	0.08	3.11	0.39	0.01	0.26	0.04	0.01	0.02	747.67	749.69
2043	0.08	3.11	0.39	0.01	0.26	0.04	0.01	0.02	747.64	749.65
2044	0.08	3.11	0.39	0.01	0.25	0.04	0.01	0.02	747.36	749.34
2045	0.08	3.11	0.39	0.01	0.25	0.04	0.01	0.02	747.34	749.32
2046	0.08	3.11	0.39	0.01	0.25	0.04	0.01	0.02	747.32	749.31
2047	0.08	3.11	0.39	0.01	0.25	0.04	0.01	0.02	747.31	749.29
2048	0.08	3.11	0.39	0.01	0.26	0.04	0.01	0.02	747.54	749.56
2049	0.08	3.11	0.39	0.01	0.25	0.04	0.01	0.02	747.29	749.27

AERA - Santa Barbara County - Cat Canyon - ECC Project

Replacement Well Drilling and Hookup Construction Activities										
2019	0.01	0.44	0.06	0.00	0.01	0.00	0.00	0.01	101.56	101.79
2020	0.01	0.44	0.06	0.00	0.01	0.00	0.00	0.01	101.25	101.48
2021	0.01	0.43	0.06	0.00	0.01	0.00	0.00	0.01	101.21	101.43
2022	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.01	101.15	101.37
2023	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.01	101.12	101.34
2024	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.01	101.10	101.31
2025	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.01	101.06	101.27
2026	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.01	101.03	101.24
2027	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.01	101.00	101.22
2028	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.01	103.31	101.20
2029	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.29	101.17
2030	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.27	103.40
2031	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.25	103.38
2032	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.24	103.36
2033	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.23	103.35
2034	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.21	103.34
2035	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.20	103.33
2036	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.20	103.32
2037	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.19	103.32
2038	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.18	103.31
2039	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.18	103.31
2040	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.18	103.30
2041	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.17	103.30
2042	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.17	103.30
2043	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.17	103.30
2044	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.17	103.30
2045	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.17	103.30
2046	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.17	103.29
2047	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.17	103.29
2048	0.01	0.43	0.05	0.00	0.01	0.00	0.00	0.00	103.17	103.29

AERA - Santa Barbara County - Cat Canyon - ECC Project

Year	Emissions (tons/year)						Emissions (MT/year)			
	ROC	CO	NOx	SOx	PM10	PM2.5	N2O	CH4	CO2	CO2e
Total Mitigated Construction Activities										
2017	0.30	12.25	1.48	0.02	0.66	0.10	0.01	0.70	2,334.82	2,350.46
2018	1.23	50.89	9.39	0.09	5.95	0.73	0.13	2.48	8,977.31	9,068.11
2019	1.88	70.39	14.86	0.14	8.57	1.09	0.18	2.31	14,431.08	14,535.34
2020	0.14	5.85	0.88	0.01	0.52	0.07	0.01	0.30	1,024.72	1,034.28
2021	0.16	6.49	0.99	0.01	0.61	0.08	0.01	0.29	1,172.38	1,182.54
2022	0.10	3.80	0.45	0.01	0.31	0.04	0.01	0.17	773.31	778.89
2023	0.29	11.37	2.80	0.02	2.59	0.29	0.06	0.53	2,069.96	2,098.23
2024	1.86	71.21	11.24	0.15	5.36	0.74	0.11	2.30	14,674.50	14,745.90
2025	0.06	2.21	0.28	0.00	0.29	0.04	0.01	0.04	520.26	523.04
2026	0.25	9.64	1.31	0.02	0.81	0.11	0.02	0.25	2,069.89	2,080.40
2027	0.08	3.00	0.37	0.01	0.26	0.04	0.01	0.05	704.40	707.09
2028	0.13	5.02	0.59	0.01	0.42	0.06	0.01	0.19	1,063.90	1,068.20
2029	0.20	7.31	0.98	0.02	0.61	0.08	0.01	0.15	1,652.45	1,657.19
2030	0.33	12.68	1.71	0.03	1.03	0.14	0.02	0.09	2,904.95	2,913.41
2031	0.28	10.60	1.43	0.02	0.83	0.12	0.02	0.08	2,404.83	2,411.70
2032	0.23	8.54	1.15	0.02	0.71	0.10	0.01	0.06	1,972.88	1,978.66
2033	0.07	2.71	0.34	0.01	0.27	0.04	0.01	0.02	652.16	654.33
2034	0.28	10.51	1.38	0.02	0.75	0.11	0.02	0.07	2,451.94	2,458.19
2035	0.68	26.01	3.44	0.06	2.16	0.30	0.04	0.17	5,902.85	5,920.30
2036	0.10	3.59	0.45	0.01	0.28	0.04	0.01	0.02	861.92	864.18
2037	0.10	3.59	0.45	0.01	0.28	0.04	0.01	0.02	861.77	864.03
2038	0.10	3.55	0.44	0.01	0.26	0.04	0.01	0.02	850.87	852.98
2039	0.10	3.55	0.44	0.01	0.26	0.04	0.01	0.02	850.52	852.60
2040	0.10	3.55	0.44	0.01	0.26	0.04	0.01	0.02	850.70	852.81
2041	0.10	3.55	0.44	0.01	0.26	0.04	0.01	0.02	850.64	852.75
2042	0.10	3.55	0.44	0.01	0.27	0.04	0.01	0.02	850.84	852.99
2043	0.10	3.55	0.44	0.01	0.27	0.04	0.01	0.02	850.81	852.95
2044	0.10	3.55	0.44	0.01	0.26	0.04	0.01	0.02	850.53	852.64
2045	0.10	3.55	0.44	0.01	0.26	0.04	0.01	0.02	850.51	852.62
2046	0.10	3.55	0.44	0.01	0.26	0.04	0.01	0.02	850.49	852.60
2047	0.10	3.55	0.44	0.01	0.26	0.04	0.01	0.02	850.48	852.59
2048	0.10	3.55	0.44	0.01	0.27	0.04	0.01	0.02	850.71	852.86
2049	0.08	3.11	0.39	0.01	0.25	0.04	0.01	0.02	747.29	749.27
Peak	1.88	71.21	14.86	0.15	8.57	1.09	0.18	2.48	14,674.50	14,745.90

Operational Emissions Summary
Unmitigated

Year	Daily Emissions (lbs/day)						Annual Emissions (tons/year)						(MT/Year)
	ROG	CO	NOX	PM10	PM2.5	SOX	ROG	CO	NOX	PM10	PM2.5	SOX	CO2e
2021	51.29	2019.71	107.35	143.14	29.95	37.99	7.85	354.45	16.98	23.40	4.77	5.96	167136.44
2022	51.39	2715.43	100.51	148.22	31.36	38.08	7.86	480.11	15.76	24.32	5.03	5.98	168620.93
2023	51.93	3069.52	111.08	148.28	31.60	38.21	7.92	551.59	16.05	24.09	5.00	5.99	170066.02
2024	52.09	3143.14	113.37	147.41	31.43	38.26	7.93	557.34	16.12	23.86	4.95	6.00	170590.62
2025	83.70	3402.16	154.38	152.56	36.10	55.75	13.49	600.83	22.97	24.70	5.71	8.80	275985.90
2026	84.86	5075.64	153.08	162.07	39.22	55.94	13.71	903.81	23.09	26.40	6.27	8.84	279436.97
2027	85.48	5842.96	154.76	167.54	40.95	56.04	13.81	1043.82	23.25	27.30	6.56	8.85	281110.96
2028	85.84	6261.45	155.94	170.79	41.96	56.11	13.87	1129.51	23.30	27.87	6.74	8.86	282122.38
2029	85.92	6400.38	154.99	171.78	42.27	56.12	13.89	1156.93	23.29	28.06	6.80	8.87	282444.90
2030	85.99	6814.14	131.97	173.86	42.45	56.18	13.90	1225.29	19.20	28.39	6.82	8.88	283527.63
2031	86.14	6953.51	132.78	175.40	42.91	56.21	13.91	1246.11	19.17	28.54	6.86	8.88	283764.07
2032	85.95	6813.14	130.41	173.97	42.47	56.18	13.90	1229.32	19.10	28.43	6.83	8.88	283555.95
2033	85.68	6463.87	129.30	171.54	41.70	56.14	13.85	1165.87	18.95	27.99	6.69	8.87	282785.84
2034	85.56	6323.98	128.54	170.52	41.38	56.12	13.82	1136.02	18.87	27.79	6.63	8.87	282424.78
2035	85.32	6323.74	124.94	170.43	41.29	56.12	13.78	1140.22	18.28	27.80	6.62	8.87	282478.11
2036	85.31	6323.54	124.57	170.43	41.28	56.12	13.78	1138.71	18.26	27.79	6.61	8.87	282455.77
2037	85.36	6393.19	124.36	170.90	41.43	56.13	13.79	1143.79	18.25	27.83	6.63	8.87	282521.14
2038	85.46	6532.64	124.23	171.91	41.75	56.14	13.81	1170.91	18.26	28.01	6.68	8.87	282831.09
2039	85.46	6463.13	124.97	171.82	41.70	56.15	13.80	1156.84	18.24	27.92	6.65	8.87	282675.44
2040	85.17	6183.93	123.31	169.97	41.08	56.11	13.74	1106.67	17.96	27.58	6.54	8.86	282077.53
2041	85.01	5974.53	122.85	168.50	40.62	56.09	13.72	1073.83	17.91	27.36	6.47	8.86	281688.08
2042	84.79	5764.79	121.43	166.71	40.07	56.05	13.69	1041.33	17.84	27.14	6.40	8.85	281287.03
2043	84.68	5625.17	121.11	165.71	39.75	56.03	13.67	1013.34	17.79	26.96	6.34	8.85	280944.24
2044	84.58	5485.59	120.86	164.86	39.48	56.01	13.65	985.69	17.73	26.77	6.28	8.85	280595.79
2045	84.42	5276.21	120.47	163.45	39.03	55.99	13.62	949.81	17.67	26.54	6.21	8.84	280160.75
2046	84.26	5136.28	119.26	162.07	38.61	55.96	13.60	920.85	17.62	26.36	6.15	8.84	279810.54
2047	84.15	4996.70	119.05	161.23	38.33	55.94	13.58	894.55	17.57	26.19	6.10	8.83	279483.53
2048	84.05	4857.11	118.81	160.29	38.04	55.92	13.55	863.28	17.52	26.00	6.03	8.83	279103.37
2049	83.89	4647.77	118.55	159.08	37.64	55.90	13.53	832.87	17.47	25.81	5.97	8.83	278736.80
2050	83.73	4438.41	118.27	157.77	37.21	55.87	13.50	797.85	17.42	25.60	5.90	8.82	278314.68
2051	83.25	3879.79	116.59	154.05	36.01	55.79	13.42	690.10	17.22	24.97	5.70	8.81	276976.48
2052	83.09	3739.88	115.48	152.92	35.66	55.76	13.40	661.99	17.18	24.81	5.64	8.80	276631.48
Peak	86.14	6,953.51	155.94	175.40	42.91	56.21	13.91	1,246.11	23.30	28.54	6.86	8.88	283,764.07
Threshold	55.00	NA	55.00	80.00	NA	NA							
Significant?	YES	NO	YES	YES	NO	NO							

Operational Emissions Summary
Mitigated (Stationary Source Emissions Still Included)

Year	Daily Emissions (lbs/day)						Annual Emissions (tons/year)						(MT/Year)
	ROG	CO	NOX	PM10	PM2.5	SOX	ROG	CO	NOX	PM10	PM2.5	SOX	CO2e
2021	48.25	2034.71	68.22	29.60	17.42	38.02	7.29	357.19	9.84	4.75	2.70	5.96	167136.44
2022	48.76	2732.29	68.87	34.93	19.06	38.10	7.38	483.19	9.99	5.72	3.00	5.98	168620.93
2023	49.49	3087.26	83.16	35.11	19.42	38.23	7.47	554.82	10.95	5.51	2.99	5.99	170062.02
2024	49.77	3161.12	87.92	34.33	19.34	38.28	7.51	560.62	11.48	5.30	2.95	6.00	170590.62
2025	80.42	3412.42	123.48	39.33	23.86	55.73	12.89	602.70	17.33	6.11	3.68	8.79	275985.89
2026	81.57	5085.91	122.17	48.84	26.99	55.92	13.11	905.68	17.45	7.81	4.25	8.83	279436.97
2027	82.67	5870.91	125.94	54.37	28.78	56.07	13.30	1048.93	17.99	8.72	4.55	8.85	281110.96
2028	83.03	6289.40	127.13	57.63	29.79	56.13	13.36	1134.61	18.04	9.29	4.73	8.86	282129.01
2029	83.11	6428.33	126.17	58.62	30.09	56.15	13.38	1162.03	18.03	9.48	4.79	8.87	282444.90
2030	83.41	6846.52	125.77	61.49	31.00	56.20	13.43	1231.20	18.07	9.96	4.94	8.88	283527.62
2031	83.56	6985.90	126.57	63.03	31.45	56.23	13.44	1252.02	18.04	10.11	4.99	8.88	283764.06
2032	83.37	6845.53	124.21	61.60	31.02	56.20	13.43	1235.23	17.96	9.99	4.95	8.88	283563.31
2033	83.10	6496.26	123.10	59.17	30.25	56.15	13.38	1171.78	17.82	9.56	4.81	8.87	282785.83
2034	82.98	6356.36	122.34	58.15	29.93	56.14	13.35	1141.93	17.74	9.35	4.75	8.86	282424.77
2035	82.97	6356.14	121.90	58.16	29.93	56.13	13.36	1146.13	17.73	9.39	4.76	8.86	282478.11
2036	82.96	6355.94	121.53	58.16	29.93	56.13	13.35	1144.63	17.70	9.38	4.75	8.86	282463.13
2037	83.01	6425.59	121.32	58.62	30.08	56.14	13.36	1149.70	17.69	9.41	4.77	8.86	282521.14
2038	83.11	6565.04	121.19	59.64	30.39	56.16	13.38	1176.82	17.71	9.59	4.82	8.87	282831.09
2039	83.11	6495.53	121.93	59.55	30.35	56.16	13.37	1162.75	17.68	9.50	4.79	8.87	282675.44
2040	82.90	6216.33	121.35	57.73	29.76	56.13	13.33	1112.58	17.60	9.17	4.69	8.86	282084.89
2041	82.74	6006.92	120.89	56.27	29.30	56.10	13.30	1079.74	17.55	8.95	4.62	8.86	281688.08
2042	82.52	5797.19	119.47	54.47	28.75	56.06	13.28	1047.24	17.49	8.73	4.55	8.85	281287.03
2043	82.42	5657.57	119.16	53.48	28.43	56.05	13.26	1019.25	17.43	8.55	4.49	8.85	280944.23
2044	82.31	5517.99	118.91	52.62	28.16	56.03	13.23	991.60	17.37	8.36	4.43	8.84	280603.15
2045	82.15	5308.61	118.51	51.22	27.71	56.00	13.21	955.73	17.31	8.13	4.36	8.84	280160.75
2046	81.99	5168.68	117.31	49.83	27.29	55.97	13.18	926.76	17.26	7.95	4.30	8.84	279810.54
2047	81.88	5029.10	117.09	49.00	27.02	55.96	13.16	900.46	17.21	7.78	4.24	8.83	279483.53
2048	81.78	4889.51	116.86	48.06	26.72	55.94	13.14	869.19	17.16	7.59	4.18	8.83	279110.73
2049	81.62	4680.16	116.60	46.84	26.32	55.91	13.12	838.78	17.11	7.40	4.12	8.83	278736.80
2050	81.46	4470.81	116.32	45.53	25.89	55.89	13.09	803.76	17.06	7.20	4.05	8.82	278314.68
2051	80.99	3912.19	114.63	41.81	24.70	55.81	13.00	696.01	16.87	6.56	3.84	8.81	276976.48
2052	80.82	3772.28	113.52	40.68	24.34	55.78	12.98	667.90	16.82	6.40	3.79	8.80	276638.84
Peak	83.56	6,985.90	127.13	63.03	31.45	56.23	13.44	1,252.02	18.07	10.11	4.99	8.88	283,764.06
Threshold	55.00	NA	55.00	80.00	NA	NA							
Significant?	YES	NO	YES	NO	NO	NO							

Operational Emissions Summary
Mitigated (Stationary Source ROG & NOx Emissions also Mitigated)

Year	Daily Emissions (lbs/day)						Annual Emissions (tons/year)						(MT/Year)
	ROG	CO	NOX	PM10	PM2.5	SOX	ROG	CO	NOX	PM10	PM2.5	SOX	CO2e
2021	48.25	2034.71	54.99	29.60	17.42	38.02	7.29	357.19	7.44	4.75	2.70	5.96	167136.44
2022	48.76	2732.29	54.99	34.93	19.06	38.10	7.38	483.19	7.48	5.72	3.00	5.98	168620.93
2023	49.49	3087.26	54.99	35.11	19.42	38.23	7.47	554.82	5.82	5.51	2.99	5.99	170062.02
2024	49.77	3161.12	54.99	34.33	19.34	38.28	7.51	560.62	5.48	5.30	2.95	6.00	170590.62
2025	54.99	3412.42	54.99	39.33	23.86	55.73	8.26	602.70	4.85	6.11	3.68	8.79	275985.89
2026	54.99	5085.91	54.99	48.84	26.99	55.92	8.27	905.68	5.21	7.81	4.25	8.83	279436.97
2027	54.99	5870.91	54.99	54.37	28.78	56.07	8.26	1048.93	4.68	8.72	4.55	8.85	281110.96
2028	54.99	6289.40	54.99	57.63	29.79	56.13	8.25	1134.61	4.51	9.29	4.73	8.86	282129.01
2029	54.99	6428.33	54.99	58.62	30.09	56.15	8.25	1162.03	4.66	9.48	4.79	8.87	282444.90
2030	54.99	6846.52	54.99	61.49	31.00	56.20	8.25	1231.20	4.79	9.96	4.94	8.88	283527.62
2031	54.99	6985.90	54.99	63.03	31.45	56.23	8.24	1252.02	4.61	10.11	4.99	8.88	283764.06
2032	54.99	6845.53	54.99	61.60	31.02	56.20	8.25	1235.23	4.96	9.99	4.95	8.88	283563.31
2033	54.99	6496.26	54.99	59.17	30.25	56.15	8.25	1171.78	5.02	9.56	4.81	8.87	282785.83
2034	54.99	6356.36	54.99	58.15	29.93	56.14	8.25	1141.93	5.09	9.35	4.75	8.86	282424.77
2035	54.99	6356.14	54.99	58.16	29.93	56.13	8.25	1146.13	5.14	9.39	4.76	8.86	282478.11
2036	54.99	6355.94	54.99	58.16	29.93	56.13	8.25	1144.63	5.19	9.38	4.75	8.86	282463.13
2037	54.99	6425.59	54.99	58.62	30.08	56.14	8.26	1149.70	5.23	9.41	4.77	8.86	282521.14
2038	54.99	6565.04	54.99	59.64	30.39	56.16	8.26	1176.82	5.26	9.59	4.82	8.87	282831.09
2039	54.99	6495.53	54.99	59.55	30.35	56.16	8.25	1162.75	5.11	9.50	4.79	8.87	282675.44
2040	54.99	6216.33	54.99	57.73	29.76	56.13	8.25	1112.58	5.13	9.17	4.69	8.86	282084.89
2041	54.99	6006.92	54.99	56.27	29.30	56.10	8.25	1079.74	5.15	8.95	4.62	8.86	281688.08
2042	54.99	5797.19	54.99	54.47	28.75	56.06	8.26	1047.24	5.34	8.73	4.55	8.85	281287.03
2043	54.99	5657.57	54.99	53.48	28.43	56.05	8.26	1019.25	5.35	8.55	4.49	8.85	280944.23
2044	54.99	5517.99	54.99	52.62	28.16	56.03	8.25	991.60	5.34	8.36	4.43	8.84	280603.15
2045	54.99	5308.61	54.99	51.22	27.71	56.00	8.25	955.73	5.35	8.13	4.36	8.84	280160.75
2046	54.99	5168.68	54.99	49.83	27.29	55.97	8.26	926.76	5.52	7.95	4.30	8.84	279810.54
2047	54.99	5029.10	54.99	49.00	27.02	55.96	8.26	900.46	5.51	7.78	4.24	8.83	279483.53
2048	54.99	4889.51	54.99	48.06	26.72	55.94	8.26	869.19	5.51	7.59	4.18	8.83	279110.73
2049	54.99	4680.16	54.99	46.84	26.32	55.91	8.26	838.78	5.50	7.40	4.12	8.83	278736.80
2050	54.99	4470.81	54.99	45.53	25.89	55.89	8.26	803.76	5.49	7.20	4.05	8.82	278314.68
2051	54.99	3912.19	54.99	41.81	24.70	55.81	8.27	696.01	5.62	6.56	3.84	8.81	276976.48
2052	54.99	3772.28	54.99	40.68	24.34	55.78	8.28	667.90	5.77	6.40	3.79	8.80	276638.84
Peak	54.99	6,985.90	54.99	63.03	31.45	56.23	8.28	1,252.02	7.48	10.11	4.99	8.88	283,764.06
Threshold	55.00	NA	55.00	80.00	NA	NA							
Significant?	NO	NO	NO	NO	NO	NO							

ATTACHMENT B

CalEEMod v.2013.2.2 Output Files

AERA - Santa Barbara - ECC On-Site Construction Equipment Years -3 thru 4
Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - Anticipated Construction Schedule Provided by the Project Applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

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by the applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Trips and VMT - Employee Trips are included in the offsite calculations.

On-road Fugitive Dust -

Vehicle Trips - Construction Run Only

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust -

Consumer Products - Construction Run Only

Area Coating -

Landscape Equipment - Construction Run Only

Construction Off-road Equipment Mitigation - Using Tier 4 Final Engines to Mitigate Construction Emissions

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	39.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	96.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	217.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	312.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	98.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	111.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	51.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1,120.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	106.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	62.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	33.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	112.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	298.00
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tblConstructionPhase	PhaseStartDate	4/30/2017	5/1/2017

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tblOffRoadEquipment	UsageHours	8.00	10.00
tblProjectCharacteristics	OperationalYear	2014	2035
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction**Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	1.8842	23.7156	9.4862	0.0236	0.0000	0.9517	0.9517	0.0000	0.8766	0.8766	0.0000	2,178.7046	2,178.7046	0.6624	0.0000	2,192.6148
2018	3.8143	37.2093	20.5538	0.0446	0.0000	1.7128	1.7128	0.0000	1.5922	1.5922	0.0000	3,983.2616	3,983.2616	1.1937	0.0000	4,008.3290
2019	5.4166	49.1911	31.7251	0.0607	0.0000	2.3907	2.3907	0.0000	2.2313	2.2313	0.0000	5,283.8798	5,283.8798	1.5526	0.0000	5,316.4854
2020	0.7471	8.1057	4.2386	0.0102	0.0000	0.3444	0.3444	0.0000	0.3187	0.3187	0.0000	882.2343	882.2343	0.2766	0.0000	888.0425
2021	0.6571	7.0487	4.0251	9.5700e-003	0.0000	0.2979	0.2979	0.0000	0.2755	0.2755	0.0000	832.0075	832.0075	0.2599	0.0000	837.4661
2022	0.2760	3.0912	1.6047	5.0600e-003	0.0000	0.1215	0.1215	0.0000	0.1118	0.1118	0.0000	444.5558	444.5558	0.1438	0.0000	447.5752
2023	1.1100	9.4125	8.3773	0.0179	0.0000	0.4187	0.4187	0.0000	0.3909	0.3909	0.0000	1,525.8548	1,525.8548	0.4458	0.0000	1,535.2171
Total	13.9053	137.7741	80.0108	0.1715	0.0000	6.2377	6.2377	0.0000	5.7970	5.7970	0.0000	15,130.4984	15,130.4984	4.5348	0.0000	15,225.7301

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Year -3 Month 1	Building Construction	1/1/2017	1/31/2017	6	26	
2	Year -3 Month 2	Building Construction	2/1/2017	2/28/2017	6	24	
3	Year -3 Month 3	Building Construction	3/1/2017	3/31/2017	6	27	

4	Year -3 Month 4	Building Construction	4/1/2017	4/29/2017	6	25
5	Year -3 Month 5	Building Construction	5/1/2017	5/31/2017	6	27
6	Year -3 Month 6	Building Construction	6/1/2017	6/30/2017	6	26
7	Year -3 Month 7	Building Construction	7/1/2017	7/31/2017	6	26
8	Year -3 Month 8	Building Construction	8/1/2017	8/31/2017	6	27
9	Year -3 Month 9	Building Construction	9/1/2017	9/30/2017	6	25
10	Year -3 Month 10	Building Construction	10/1/2017	10/31/2017	6	27
11	Year -3 Month 11	Building Construction	11/1/2017	11/30/2017	6	26
12	Year -3 Month 12	Building Construction	12/1/2017	12/31/2017	6	26
13	Year -2 Month 1	Building Construction	1/1/2018	1/31/2018	6	27
14	Year -2 Month 2	Building Construction	2/1/2018	2/28/2018	6	24
15	Year -2 Month 3	Building Construction	3/1/2018	3/31/2018	6	27
16	Year -2 Month 4	Building Construction	4/1/2018	4/30/2018	6	25
17	Year -2 Month 5	Building Construction	5/1/2018	5/31/2018	6	27
18	Year -2 Month 6	Building Construction	6/1/2018	6/30/2018	6	26
19	Year -2 Month 7	Building Construction	7/1/2018	7/31/2018	6	26
20	Year -2 Month 8	Building Construction	8/1/2018	8/31/2018	6	27
21	Year -2 Month 9	Building Construction	9/1/2018	9/29/2018	6	25
22	Year -2 Month 10	Building Construction	10/1/2018	10/31/2018	6	27
23	Year -2 Month 11	Building Construction	11/1/2018	11/30/2018	6	26
24	Year -2 Month 12	Building Construction	12/1/2018	12/31/2018	6	26
25	Year -1 Month 1	Building Construction	1/1/2019	1/31/2019	6	27
26	Year -1 Month 2	Building Construction	2/1/2019	2/28/2019	6	24
27	Year -1 Month 3	Building Construction	3/1/2019	3/30/2019	6	26
28	Year -1 Month 4	Building Construction	4/1/2019	4/30/2019	6	26
29	Year -1 Month 5	Building Construction	5/1/2019	5/31/2019	6	27
30	Year -1 Month 6	Building Construction	6/1/2019	6/29/2019	6	25
31	Year -1 Month 7	Building Construction	7/1/2019	7/31/2019	6	27

32	Year -1 Month 8	Building Construction	8/1/2019	8/31/2019	6	27
33	Year -1 Month 9	Building Construction	9/1/2019	9/30/2019	6	25
34	Year -1 Month 10	Building Construction	10/1/2019	10/31/2019	6	27
35	Year -1 Month 11	Building Construction	11/1/2019	11/30/2019	6	26
36	Year -1 Month 12	Building Construction	12/1/2019	12/31/2019	6	26
37	Year 1 Month 1	Building Construction	1/1/2020	1/31/2020	6	27
38	Year 1 Month 2	Building Construction	2/1/2020	2/28/2020	6	24
39	Year 1 Month 3	Building Construction	3/1/2020	3/31/2020	6	26
40	Year 1 Month 4	Building Construction	4/1/2020	4/30/2020	6	26
41	Year 1 Month 5	Building Construction	5/1/2020	5/30/2020	6	26
42	Year 1 Month 6	Building Construction	6/1/2020	6/30/2020	6	26
43	Year 1 Month 7	Building Construction	7/1/2020	7/31/2020	6	27
44	Year 1 Month 8	Building Construction	8/1/2020	8/31/2020	6	26
45	Year 1 Month 9	Building Construction	9/1/2020	9/30/2020	6	26
46	Year 1 Month 10	Building Construction	10/1/2020	10/31/2020	6	27
47	Year 1 Month 11	Building Construction	11/1/2020	11/30/2020	6	25
48	Year 1 Month 12	Building Construction	12/1/2020	12/31/2020	6	27
49	Year 2 Month 1	Building Construction	1/1/2021	1/30/2021	6	26
50	Year 2 Month 2	Building Construction	2/1/2021	2/27/2021	6	24
51	Year 2 Month 3	Building Construction	3/1/2021	3/31/2021	6	27
52	Year 2 Month 4	Building Construction	4/1/2021	4/30/2021	6	26
53	Year 2 Month 5	Building Construction	5/1/2021	5/31/2021	6	26
54	Year 2 Month 6	Building Construction	6/1/2021	6/30/2021	6	26
55	Year 2 Month 7	Building Construction	7/1/2021	7/31/2021	6	27
56	Year 2 Month 8	Building Construction	8/1/2021	8/31/2021	6	26
57	Year 2 Month 9	Building Construction	9/1/2021	9/30/2021	6	26
58	Year 2 Month 10	Building Construction	10/1/2021	10/30/2021	6	26
59	Year 2 Month 11	Building Construction	11/1/2021	11/30/2021	6	26

60	Year 2 Month 12	Building Construction	12/1/2021	12/31/2021	6	27
61	Year 3 Month 1	Building Construction	1/1/2022	1/31/2022	6	26
62	Year 3 Month 2	Building Construction	2/1/2022	2/28/2022	6	24
63	Year 3 Month 3	Building Construction	3/1/2022	3/31/2022	6	27
64	Year 3 Month 4	Building Construction	4/1/2022	4/30/2022	6	26
65	Year 3 Month 5	Building Construction	5/1/2022	5/31/2022	6	26
66	Year 3 Month 6	Building Construction	6/1/2022	6/30/2022	6	26
67	Year 3 Month 7	Building Construction	7/1/2022	7/30/2022	6	26
68	Year 3 Month 8	Building Construction	8/1/2022	8/31/2022	6	27
69	Year 3 Month 9	Building Construction	9/1/2022	9/30/2022	6	26
70	Year 3 Month 10	Building Construction	10/1/2022	10/31/2022	6	26
71	Year 3 Month 11	Building Construction	11/1/2022	11/30/2022	6	26
72	Year 3 Month 12	Building Construction	12/1/2022	12/31/2022	6	27
73	Year 4 Month 1	Building Construction	1/1/2023	1/31/2023	6	26
74	Year 4 Month 2	Building Construction	2/1/2023	2/28/2023	6	24
75	Year 4 Month 3	Building Construction	3/1/2023	3/31/2023	6	27
76	Year 4 Month 4	Building Construction	4/1/2023	4/29/2023	6	25
77	Year 4 Month 5	Building Construction	5/1/2023	5/31/2023	6	27
78	Year 4 Month 6	Building Construction	6/1/2023	6/30/2023	6	26
79	Year 4 Month 7	Building Construction	7/1/2023	7/31/2023	6	26
80	Year 4 Month 8	Building Construction	8/1/2023	8/31/2023	6	27
81	Year 4 Month 9	Building Construction	9/1/2023	9/30/2023	6	26
82	Year 4 Month 10	Building Construction	10/1/2023	10/31/2023	6	26
83	Year 4 Month 11	Building Construction	11/1/2023	11/30/2023	6	26
84	Year 4 Month 12	Building Construction	12/1/2023	12/30/2023	6	26

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Year -3 Month 1	Crawler Tractors	1	10.00	585	0.43
Year -3 Month 1	Crawler Tractors	1	10.00	207	0.43
Year -3 Month 1	Crawler Tractors	4	10.00	232	0.43
Year -3 Month 1	Generator Sets	1	10.00	18	0.74
Year -3 Month 1	Graders	1	10.00	259	0.41
Year -3 Month 1	Other Construction Equipment	1	10.00	407	0.42
Year -3 Month 1	Other Construction Equipment	3	10.00	130	0.42
Year -3 Month 2	Crawler Tractors	1	10.00	585	0.43
Year -3 Month 2	Crawler Tractors	1	10.00	207	0.43
Year -3 Month 2	Crawler Tractors	4	10.00	232	0.43
Year -3 Month 2	Generator Sets	1	10.00	18	0.74
Year -3 Month 2	Graders	1	10.00	259	0.41
Year -3 Month 2	Other Construction Equipment	1	10.00	407	0.42
Year -3 Month 2	Other Construction Equipment	3	10.00	130	0.42
Year -3 Month 3	Crawler Tractors	1	10.00	585	0.43
Year -3 Month 3	Crawler Tractors	1	10.00	207	0.43
Year -3 Month 3	Crawler Tractors	4	10.00	232	0.43
Year -3 Month 3	Generator Sets	1	10.00	18	0.74
Year -3 Month 3	Graders	1	10.00	259	0.41
Year -3 Month 3	Other Construction Equipment	1	10.00	407	0.42
Year -3 Month 3	Other Construction Equipment	3	10.00	130	0.42
Year -3 Month 4	Crawler Tractors	1	10.00	585	0.43
Year -3 Month 4	Crawler Tractors	1	10.00	207	0.43

Year -3 Month 4	Crawler Tractors	4	10.00	232	0.43
Year -3 Month 4	Generator Sets	1	10.00	18	0.74
Year -3 Month 4	Graders	1	10.00	259	0.41
Year -3 Month 4	Other Construction Equipment	1	10.00	407	0.42
Year -3 Month 4	Other Construction Equipment	3	10.00	130	0.42
Year -3 Month 5	Crawler Tractors	1	10.00	585	0.43
Year -3 Month 5	Crawler Tractors	1	10.00	207	0.43
Year -3 Month 5	Crawler Tractors	4	10.00	232	0.43
Year -3 Month 5	Generator Sets	1	10.00	18	0.74
Year -3 Month 5	Graders	1	10.00	259	0.41
Year -3 Month 5	Other Construction Equipment	1	10.00	407	0.42
Year -3 Month 5	Other Construction Equipment	3	10.00	130	0.42
Year -3 Month 6	Crawler Tractors	1	10.00	585	0.43
Year -3 Month 6	Crawler Tractors	1	10.00	207	0.43
Year -3 Month 6	Crawler Tractors	4	10.00	232	0.43
Year -3 Month 6	Generator Sets	1	10.00	18	0.74
Year -3 Month 6	Graders	1	10.00	259	0.41
Year -3 Month 6	Other Construction Equipment	1	10.00	407	0.42
Year -3 Month 6	Other Construction Equipment	3	10.00	130	0.42
Year -3 Month 7	Crawler Tractors	2	10.00	585	0.43
Year -3 Month 7	Crawler Tractors	2	10.00	207	0.43
Year -3 Month 7	Crawler Tractors	8	10.00	232	0.43
Year -3 Month 7	Generator Sets	2	10.00	18	0.74
Year -3 Month 7	Graders	2	10.00	259	0.41
Year -3 Month 7	Other Construction Equipment	2	10.00	407	0.42
Year -3 Month 7	Other Construction Equipment	6	10.00	130	0.42
Year -3 Month 8	Crawler Tractors	2	10.00	585	0.43
Year -3 Month 8	Crawler Tractors	2	10.00	207	0.43

Year -3 Month 8	Crawler Tractors	8	10.00	232	0.43
Year -3 Month 8	Generator Sets	2	10.00	18	0.74
Year -3 Month 8	Graders	2	10.00	259	0.41
Year -3 Month 8	Other Construction Equipment	2	10.00	407	0.42
Year -3 Month 8	Other Construction Equipment	6	10.00	130	0.42
Year -3 Month 9	Crawler Tractors	1	10.00	585	0.43
Year -3 Month 9	Crawler Tractors	1	10.00	207	0.43
Year -3 Month 9	Crawler Tractors	4	10.00	232	0.43
Year -3 Month 9	Generator Sets	1	10.00	18	0.74
Year -3 Month 9	Graders	1	10.00	259	0.41
Year -3 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year -3 Month 9	Other Construction Equipment	3	10.00	130	0.42
Year -3 Month 10	Crawler Tractors	1	10.00	585	0.43
Year -3 Month 10	Crawler Tractors	1	10.00	207	0.43
Year -3 Month 10	Crawler Tractors	4	10.00	232	0.43
Year -3 Month 10	Generator Sets	1	10.00	18	0.74
Year -3 Month 10	Graders	1	10.00	259	0.41
Year -3 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year -3 Month 10	Other Construction Equipment	3	10.00	130	0.42
Year -3 Month 11	Crawler Tractors	1	10.00	585	0.43
Year -3 Month 11	Crawler Tractors	1	10.00	207	0.43
Year -3 Month 11	Crawler Tractors	4	10.00	232	0.43
Year -3 Month 11	Generator Sets	1	10.00	18	0.74
Year -3 Month 11	Graders	1	10.00	259	0.41
Year -3 Month 11	Other Construction Equipment	1	10.00	407	0.42
Year -3 Month 11	Other Construction Equipment	3	10.00	130	0.42
Year -3 Month 12	Crawler Tractors	1	10.00	585	0.43
Year -3 Month 12	Crawler Tractors	1	10.00	207	0.43

Year -3 Month 12	Crawler Tractors	4	10.00	232	0.43
Year -3 Month 12	Generator Sets	1	10.00	18	0.74
Year -3 Month 12	Graders	1	10.00	259	0.41
Year -3 Month 12	Other Construction Equipment	1	10.00	407	0.42
Year -3 Month 12	Other Construction Equipment	3	10.00	130	0.42
Year -2 Month 1	Air Compressors	1	10.00	50	0.48
Year -2 Month 1	Cranes	1	10.00	62	0.29
Year -2 Month 1	Crawler Tractors	1	10.00	585	0.43
Year -2 Month 1	Crawler Tractors	1	10.00	207	0.43
Year -2 Month 1	Crawler Tractors	4	10.00	232	0.43
Year -2 Month 1	Excavators	1	10.00	42	0.38
Year -2 Month 1	Forklifts	2	10.00	73	0.20
Year -2 Month 1	Generator Sets	1	10.00	18	0.74
Year -2 Month 1	Graders	1	10.00	259	0.41
Year -2 Month 1	Other Construction Equipment	4	10.00	180	0.42
Year -2 Month 1	Other Construction Equipment	4	10.00	130	0.42
Year -2 Month 1	Other Construction Equipment	1	10.00	407	0.42
Year -2 Month 1	Other Construction Equipment	3	10.00	210	0.42
Year -2 Month 1	Other Construction Equipment	1	10.00	273	0.42
Year -2 Month 1	Other Construction Equipment	2	10.00	50	0.42
Year -2 Month 1	Plate Compactors	1	10.00	3	0.43
Year -2 Month 1	Plate Compactors	1	10.00	8	0.43
Year -2 Month 1	Rubber Tired Loaders	1	10.00	125	0.36
Year -2 Month 1	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 1	Tractors/Loaders/Backhoes	2	10.00	67	0.37
Year -2 Month 1	Welders	1	10.00	48	0.45
Year -2 Month 2	Air Compressors	2	10.00	50	0.48
Year -2 Month 2	Cranes	3	10.00	62	0.29

Year -2 Month 2	Cranes	1	10.00	150	0.29
Year -2 Month 2	Crawler Tractors	1	10.00	585	0.43
Year -2 Month 2	Crawler Tractors	1	10.00	207	0.43
Year -2 Month 2	Crawler Tractors	4	10.00	232	0.43
Year -2 Month 2	Excavators	1	10.00	42	0.38
Year -2 Month 2	Forklifts	4	10.00	73	0.20
Year -2 Month 2	Generator Sets	2	10.00	18	0.74
Year -2 Month 2	Graders	1	10.00	259	0.41
Year -2 Month 2	Other Construction Equipment	4	10.00	180	0.42
Year -2 Month 2	Other Construction Equipment	4	10.00	130	0.42
Year -2 Month 2	Other Construction Equipment	1	10.00	407	0.42
Year -2 Month 2	Other Construction Equipment	3	10.00	210	0.42
Year -2 Month 2	Other Construction Equipment	1	10.00	273	0.42
Year -2 Month 2	Other Construction Equipment	2	10.00	50	0.42
Year -2 Month 2	Plate Compactors	1	10.00	3	0.43
Year -2 Month 2	Plate Compactors	2	10.00	8	0.43
Year -2 Month 2	Rubber Tired Loaders	1	10.00	125	0.36
Year -2 Month 2	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 2	Tractors/Loaders/Backhoes	3	10.00	67	0.37
Year -2 Month 2	Welders	2	10.00	48	0.45
Year -2 Month 3	Aerial Lifts	1	10.00	24	0.31
Year -2 Month 3	Air Compressors	4	10.00	50	0.48
Year -2 Month 3	Cranes	3	10.00	62	0.29
Year -2 Month 3	Cranes	1	10.00	150	0.29
Year -2 Month 3	Crawler Tractors	3	10.00	585	0.43
Year -2 Month 3	Crawler Tractors	2	10.00	207	0.43
Year -2 Month 3	Crawler Tractors	5	10.00	232	0.43
Year -2 Month 3	Excavators	1	10.00	42	0.38

Year -2 Month 3	Forklifts	4	10.00	73	0.20
Year -2 Month 3	Generator Sets	4	10.00	18	0.74
Year -2 Month 3	Graders	2	10.00	259	0.41
Year -2 Month 3	Other Construction Equipment	7	10.00	180	0.42
Year -2 Month 3	Other Construction Equipment	6	10.00	130	0.42
Year -2 Month 3	Other Construction Equipment	2	10.00	407	0.42
Year -2 Month 3	Other Construction Equipment	4	10.00	210	0.42
Year -2 Month 3	Other Construction Equipment	1	10.00	273	0.42
Year -2 Month 3	Other Construction Equipment	4	10.00	50	0.42
Year -2 Month 3	Other Construction Equipment	4	10.00	305	0.42
Year -2 Month 3	Plate Compactors	1	10.00	3	0.43
Year -2 Month 3	Plate Compactors	2	10.00	8	0.43
Year -2 Month 3	Rubber Tired Loaders	2	10.00	125	0.36
Year -2 Month 3	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 3	Tractors/Loaders/Backhoes	3	10.00	67	0.37
Year -2 Month 3	Welders	4	10.00	48	0.45
Year -2 Month 4	Aerial Lifts	2	10.00	24	0.31
Year -2 Month 4	Air Compressors	4	10.00	50	0.48
Year -2 Month 4	Cranes	3	10.00	62	0.29
Year -2 Month 4	Cranes	1	10.00	150	0.29
Year -2 Month 4	Crawler Tractors	3	10.00	585	0.43
Year -2 Month 4	Crawler Tractors	2	10.00	207	0.43
Year -2 Month 4	Crawler Tractors	5	10.00	232	0.43
Year -2 Month 4	Excavators	1	10.00	42	0.38
Year -2 Month 4	Forklifts	4	10.00	73	0.20
Year -2 Month 4	Generator Sets	4	10.00	18	0.74
Year -2 Month 4	Graders	2	10.00	259	0.41
Year -2 Month 4	Other Construction Equipment	7	10.00	180	0.42

Year -2 Month 4	Other Construction Equipment	6	10.00	130	0.42
Year -2 Month 4	Other Construction Equipment	2	10.00	407	0.42
Year -2 Month 4	Other Construction Equipment	4	10.00	210	0.42
Year -2 Month 4	Other Construction Equipment	1	10.00	273	0.42
Year -2 Month 4	Other Construction Equipment	4	10.00	50	0.42
Year -2 Month 4	Other Construction Equipment	4	10.00	305	0.42
Year -2 Month 4	Plate Compactors	1	10.00	3	0.43
Year -2 Month 4	Plate Compactors	2	10.00	8	0.43
Year -2 Month 4	Rubber Tired Loaders	2	10.00	125	0.36
Year -2 Month 4	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 4	Tractors/Loaders/Backhoes	3	10.00	67	0.37
Year -2 Month 4	Welders	4	10.00	48	0.45
Year -2 Month 5	Aerial Lifts	2	10.00	24	0.31
Year -2 Month 5	Air Compressors	4	10.00	50	0.48
Year -2 Month 5	Cranes	3	10.00	62	0.29
Year -2 Month 5	Cranes	1	10.00	150	0.29
Year -2 Month 5	Crawler Tractors	3	10.00	585	0.43
Year -2 Month 5	Crawler Tractors	2	10.00	207	0.43
Year -2 Month 5	Crawler Tractors	5	10.00	232	0.43
Year -2 Month 5	Excavators	1	10.00	42	0.38
Year -2 Month 5	Forklifts	4	10.00	73	0.20
Year -2 Month 5	Generator Sets	4	10.00	18	0.74
Year -2 Month 5	Graders	2	10.00	259	0.41
Year -2 Month 5	Other Construction Equipment	8	10.00	180	0.42
Year -2 Month 5	Other Construction Equipment	6	10.00	130	0.42
Year -2 Month 5	Other Construction Equipment	2	10.00	407	0.42
Year -2 Month 5	Other Construction Equipment	6	10.00	210	0.42
Year -2 Month 5	Other Construction Equipment	1	10.00	273	0.42

Year -2 Month 5	Other Construction Equipment	4	10.00	50	0.42
Year -2 Month 5	Other Construction Equipment	5	10.00	305	0.42
Year -2 Month 5	Plate Compactors	1	10.00	3	0.43
Year -2 Month 5	Plate Compactors	2	10.00	8	0.43
Year -2 Month 5	Rubber Tired Loaders	2	10.00	125	0.36
Year -2 Month 5	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 5	Tractors/Loaders/Backhoes	2	10.00	67	0.37
Year -2 Month 5	Welders	7	10.00	48	0.45
Year -2 Month 6	Aerial Lifts	2	10.00	24	0.31
Year -2 Month 6	Air Compressors	4	10.00	50	0.48
Year -2 Month 6	Cranes	5	10.00	62	0.29
Year -2 Month 6	Cranes	1	10.00	150	0.29
Year -2 Month 6	Cranes	1	10.00	240	0.29
Year -2 Month 6	Crawler Tractors	3	10.00	585	0.43
Year -2 Month 6	Crawler Tractors	2	10.00	207	0.43
Year -2 Month 6	Crawler Tractors	5	10.00	232	0.43
Year -2 Month 6	Excavators	1	10.00	42	0.38
Year -2 Month 6	Forklifts	4	10.00	73	0.20
Year -2 Month 6	Generator Sets	4	10.00	18	0.74
Year -2 Month 6	Graders	2	10.00	259	0.41
Year -2 Month 6	Other Construction Equipment	8	10.00	180	0.42
Year -2 Month 6	Other Construction Equipment	6	10.00	130	0.42
Year -2 Month 6	Other Construction Equipment	2	10.00	407	0.42
Year -2 Month 6	Other Construction Equipment	6	10.00	210	0.42
Year -2 Month 6	Other Construction Equipment	1	10.00	273	0.42
Year -2 Month 6	Other Construction Equipment	4	10.00	50	0.42
Year -2 Month 6	Other Construction Equipment	6	10.00	305	0.42
Year -2 Month 6	Plate Compactors	1	10.00	3	0.43

Year -2 Month 6	Plate Compactors	2	10.00	8	0.43
Year -2 Month 6	Rubber Tired Loaders	2	10.00	125	0.36
Year -2 Month 6	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 6	Tractors/Loaders/Backhoes	2	10.00	67	0.37
Year -2 Month 6	Welders	7	10.00	48	0.45
Year -2 Month 7	Aerial Lifts	2	10.00	24	0.31
Year -2 Month 7	Air Compressors	4	10.00	50	0.48
Year -2 Month 7	Cranes	4	10.00	62	0.29
Year -2 Month 7	Cranes	1	10.00	150	0.29
Year -2 Month 7	Crawler Tractors	3	10.00	585	0.43
Year -2 Month 7	Crawler Tractors	2	10.00	207	0.43
Year -2 Month 7	Crawler Tractors	5	10.00	232	0.43
Year -2 Month 7	Forklifts	4	10.00	73	0.20
Year -2 Month 7	Generator Sets	4	10.00	18	0.74
Year -2 Month 7	Graders	2	10.00	259	0.41
Year -2 Month 7	Other Construction Equipment	7	10.00	180	0.42
Year -2 Month 7	Other Construction Equipment	4	10.00	130	0.42
Year -2 Month 7	Other Construction Equipment	2	10.00	407	0.42
Year -2 Month 7	Other Construction Equipment	6	10.00	210	0.42
Year -2 Month 7	Other Construction Equipment	1	10.00	273	0.42
Year -2 Month 7	Other Construction Equipment	4	10.00	50	0.42
Year -2 Month 7	Other Construction Equipment	6	10.00	305	0.42
Year -2 Month 7	Plate Compactors	1	10.00	3	0.43
Year -2 Month 7	Plate Compactors	2	10.00	8	0.43
Year -2 Month 7	Rubber Tired Loaders	2	10.00	125	0.36
Year -2 Month 7	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 7	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year -2 Month 7	Welders	7	10.00	48	0.45

Year -2 Month 8	Aerial Lifts	1	10.00	24	0.31
Year -2 Month 8	Air Compressors	2	10.00	50	0.48
Year -2 Month 8	Cranes	4	10.00	62	0.29
Year -2 Month 8	Cranes	1	10.00	150	0.29
Year -2 Month 8	Crawler Tractors	3	10.00	585	0.43
Year -2 Month 8	Crawler Tractors	2	10.00	207	0.43
Year -2 Month 8	Crawler Tractors	5	10.00	232	0.43
Year -2 Month 8	Forklifts	4	10.00	73	0.20
Year -2 Month 8	Generator Sets	2	10.00	18	0.74
Year -2 Month 8	Graders	2	10.00	259	0.41
Year -2 Month 8	Other Construction Equipment	7	10.00	180	0.42
Year -2 Month 8	Other Construction Equipment	4	10.00	130	0.42
Year -2 Month 8	Other Construction Equipment	2	10.00	407	0.42
Year -2 Month 8	Other Construction Equipment	6	10.00	210	0.42
Year -2 Month 8	Other Construction Equipment	1	10.00	273	0.42
Year -2 Month 8	Other Construction Equipment	4	10.00	50	0.42
Year -2 Month 8	Other Construction Equipment	4	10.00	305	0.42
Year -2 Month 8	Plate Compactors	1	10.00	3	0.43
Year -2 Month 8	Plate Compactors	2	10.00	8	0.43
Year -2 Month 8	Rubber Tired Loaders	1	10.00	125	0.36
Year -2 Month 8	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 8	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year -2 Month 8	Welders	7	10.00	48	0.45
Year -2 Month 9	Aerial Lifts	1	10.00	24	0.31
Year -2 Month 9	Air Compressors	2	10.00	50	0.48
Year -2 Month 9	Cranes	2	10.00	62	0.29
Year -2 Month 9	Cranes	1	10.00	150	0.29
Year -2 Month 9	Crawler Tractors	2	10.00	585	0.43

Year -2 Month 9	Crawler Tractors	4	10.00	232	0.43
Year -2 Month 9	Forklifts	3	10.00	73	0.20
Year -2 Month 9	Generator Sets	2	10.00	18	0.74
Year -2 Month 9	Graders	1	10.00	259	0.41
Year -2 Month 9	Other Construction Equipment	6	10.00	180	0.42
Year -2 Month 9	Other Construction Equipment	2	10.00	130	0.42
Year -2 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year -2 Month 9	Other Construction Equipment	4	10.00	210	0.42
Year -2 Month 9	Other Construction Equipment	1	10.00	273	0.42
Year -2 Month 9	Other Construction Equipment	4	10.00	50	0.42
Year -2 Month 9	Other Construction Equipment	4	10.00	305	0.42
Year -2 Month 9	Plate Compactors	1	10.00	3	0.43
Year -2 Month 9	Plate Compactors	2	10.00	8	0.43
Year -2 Month 9	Rubber Tired Loaders	1	10.00	125	0.36
Year -2 Month 9	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 9	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year -2 Month 9	Welders	7	10.00	48	0.45
Year -2 Month 10	Aerial Lifts	1	10.00	24	0.31
Year -2 Month 10	Air Compressors	2	10.00	50	0.48
Year -2 Month 10	Cranes	2	10.00	62	0.29
Year -2 Month 10	Crawler Tractors	1	10.00	585	0.43
Year -2 Month 10	Crawler Tractors	1	10.00	207	0.43
Year -2 Month 10	Crawler Tractors	4	10.00	232	0.43
Year -2 Month 10	Forklifts	3	10.00	73	0.20
Year -2 Month 10	Generator Sets	2	10.00	18	0.74
Year -2 Month 10	Graders	1	10.00	259	0.41
Year -2 Month 10	Other Construction Equipment	6	10.00	180	0.42
Year -2 Month 10	Other Construction Equipment	2	10.00	130	0.42

Year -2 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year -2 Month 10	Other Construction Equipment	4	10.00	210	0.42
Year -2 Month 10	Other Construction Equipment	1	10.00	273	0.42
Year -2 Month 10	Other Construction Equipment	2	10.00	50	0.42
Year -2 Month 10	Plate Compactors	1	10.00	3	0.43
Year -2 Month 10	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 10	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year -2 Month 10	Welders	4	10.00	48	0.45
Year -2 Month 11	Aerial Lifts	1	10.00	24	0.31
Year -2 Month 11	Air Compressors	2	10.00	50	0.48
Year -2 Month 11	Cranes	2	10.00	62	0.29
Year -2 Month 11	Forklifts	2	10.00	73	0.20
Year -2 Month 11	Generator Sets	2	10.00	18	0.74
Year -2 Month 11	Other Construction Equipment	3	10.00	180	0.42
Year -2 Month 11	Other Construction Equipment	3	10.00	210	0.42
Year -2 Month 11	Other Construction Equipment	1	10.00	273	0.42
Year -2 Month 11	Other Construction Equipment	2	10.00	50	0.42
Year -2 Month 11	Plate Compactors	1	10.00	3	0.43
Year -2 Month 11	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 11	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year -2 Month 11	Welders	2	10.00	48	0.45
Year -2 Month 12	Aerial Lifts	1	10.00	24	0.31
Year -2 Month 12	Air Compressors	1	10.00	50	0.48
Year -2 Month 12	Cranes	2	10.00	62	0.29
Year -2 Month 12	Forklifts	2	10.00	73	0.20
Year -2 Month 12	Generator Sets	1	10.00	18	0.74
Year -2 Month 12	Other Construction Equipment	3	10.00	180	0.42
Year -2 Month 12	Other Construction Equipment	3	10.00	210	0.42

Year -2 Month 12	Other Construction Equipment	1	10.00	273	0.42
Year -2 Month 12	Other Construction Equipment	1	10.00	50	0.42
Year -2 Month 12	Skid Steer Loaders	1	10.00	45	0.37
Year -2 Month 12	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year -2 Month 12	Welders	1	10.00	48	0.45
Year -1 Month 1	Air Compressors	1	10.00	50	0.48
Year -1 Month 1	Crawler Tractors	2	10.00	232	0.43
Year -1 Month 1	Forklifts	2	10.00	73	0.20
Year -1 Month 1	Generator Sets	1	10.00	18	0.74
Year -1 Month 1	Other Construction Equipment	1	10.00	180	0.42
Year -1 Month 1	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 1	Other Construction Equipment	2	10.00	50	0.42
Year -1 Month 1	Other Construction Equipment	2	10.00	210	0.42
Year -1 Month 1	Other Construction Equipment	4	10.00	130	0.42
Year -1 Month 1	Other Construction Equipment	4	10.00	180	0.42
Year -1 Month 1	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 1	Plate Compactors	2	10.00	33	0.43
Year -1 Month 1	Plate Compactors	1	10.00	14	0.43
Year -1 Month 1	Plate Compactors	1	10.00	3	0.43
Year -1 Month 1	Rubber Tired Loaders	1	10.00	125	0.36
Year -1 Month 1	Rubber Tired Loaders	2	10.00	160	0.36
Year -1 Month 1	Skid Steer Loaders	1	10.00	45	0.37
Year -1 Month 1	Tractors/Loaders/Backhoes	6	10.00	67	0.37
Year -1 Month 1	Welders	1	10.00	48	0.45
Year -1 Month 2	Air Compressors	2	10.00	50	0.48
Year -1 Month 2	Cranes	8	10.00	226	0.29
Year -1 Month 2	Cranes	2	10.00	62	0.29
Year -1 Month 2	Cranes	1	10.00	150	0.29

Year -1 Month 2	Crawler Tractors	2	10.00	232	0.43
Year -1 Month 2	Forklifts	4	10.00	73	0.20
Year -1 Month 2	Generator Sets	2	10.00	18	0.74
Year -1 Month 2	Other Construction Equipment	1	10.00	180	0.42
Year -1 Month 2	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 2	Other Construction Equipment	2	10.00	50	0.42
Year -1 Month 2	Other Construction Equipment	2	10.00	210	0.42
Year -1 Month 2	Other Construction Equipment	13	10.00	130	0.42
Year -1 Month 2	Other Construction Equipment	13	10.00	180	0.42
Year -1 Month 2	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 2	Plate Compactors	2	10.00	33	0.43
Year -1 Month 2	Plate Compactors	2	10.00	14	0.43
Year -1 Month 2	Plate Compactors	1	10.00	3	0.43
Year -1 Month 2	Rubber Tired Loaders	1	10.00	125	0.36
Year -1 Month 2	Rubber Tired Loaders	2	10.00	160	0.36
Year -1 Month 2	Skid Steer Loaders	1	10.00	45	0.37
Year -1 Month 2	Tractors/Loaders/Backhoes	9	10.00	67	0.37
Year -1 Month 2	Welders	2	10.00	48	0.45
Year -1 Month 3	Aerial Lifts	1	10.00	24	0.31
Year -1 Month 3	Air Compressors	4	10.00	50	0.48
Year -1 Month 3	Cranes	8	10.00	226	0.29
Year -1 Month 3	Cranes	2	10.00	62	0.29
Year -1 Month 3	Cranes	1	10.00	150	0.29
Year -1 Month 3	Crawler Tractors	6	10.00	232	0.43
Year -1 Month 3	Crawler Tractors	1	10.00	585	0.43
Year -1 Month 3	Crawler Tractors	1	10.00	207	0.43
Year -1 Month 3	Forklifts	4	10.00	73	0.20
Year -1 Month 3	Generator Sets	4	10.00	18	0.74

Year -1 Month 3	Graders	1	10.00	259	0.41
Year -1 Month 3	Other Construction Equipment	1	10.00	407	0.42
Year -1 Month 3	Other Construction Equipment	1	10.00	180	0.42
Year -1 Month 3	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 3	Other Construction Equipment	4	10.00	50	0.42
Year -1 Month 3	Other Construction Equipment	3	10.00	210	0.42
Year -1 Month 3	Other Construction Equipment	4	10.00	305	0.42
Year -1 Month 3	Other Construction Equipment	15	10.00	130	0.42
Year -1 Month 3	Other Construction Equipment	16	10.00	180	0.42
Year -1 Month 3	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 3	Plate Compactors	2	10.00	33	0.43
Year -1 Month 3	Plate Compactors	2	10.00	14	0.43
Year -1 Month 3	Plate Compactors	1	10.00	3	0.43
Year -1 Month 3	Rubber Tired Loaders	2	10.00	125	0.36
Year -1 Month 3	Rubber Tired Loaders	2	10.00	160	0.36
Year -1 Month 3	Skid Steer Loaders	1	10.00	45	0.37
Year -1 Month 3	Tractors/Loaders/Backhoes	9	10.00	67	0.37
Year -1 Month 3	Welders	14	10.00	42	0.45
Year -1 Month 3	Welders	4	10.00	48	0.45
Year -1 Month 3	Welders	14	10.00	42	0.45
Year -1 Month 4	Aerial Lifts	2	10.00	24	0.31
Year -1 Month 4	Air Compressors	5	10.00	50	0.48
Year -1 Month 4	Cranes	8	10.00	226	0.29
Year -1 Month 4	Cranes	2	10.00	62	0.29
Year -1 Month 4	Cranes	1	10.00	150	0.29
Year -1 Month 4	Crawler Tractors	6	10.00	232	0.43
Year -1 Month 4	Crawler Tractors	1	10.00	585	0.43
Year -1 Month 4	Crawler Tractors	1	10.00	207	0.43

Year -1 Month 4	Forklifts	4	10.00	73	0.20
Year -1 Month 4	Generator Sets	5	10.00	18	0.74
Year -1 Month 4	Graders	1	10.00	259	0.41
Year -1 Month 4	Other Construction Equipment	1	10.00	407	0.42
Year -1 Month 4	Other Construction Equipment	1	10.00	180	0.42
Year -1 Month 4	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 4	Other Construction Equipment	4	10.00	50	0.42
Year -1 Month 4	Other Construction Equipment	8	10.00	210	0.42
Year -1 Month 4	Other Construction Equipment	4	10.00	305	0.42
Year -1 Month 4	Other Construction Equipment	17	10.00	130	0.42
Year -1 Month 4	Other Construction Equipment	19	10.00	180	0.42
Year -1 Month 4	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 4	Plate Compactors	2	10.00	33	0.43
Year -1 Month 4	Plate Compactors	2	10.00	14	0.43
Year -1 Month 4	Plate Compactors	1	10.00	3	0.43
Year -1 Month 4	Rubber Tired Loaders	2	10.00	125	0.36
Year -1 Month 4	Rubber Tired Loaders	2	10.00	160	0.36
Year -1 Month 4	Skid Steer Loaders	1	10.00	45	0.37
Year -1 Month 4	Tractors/Loaders/Backhoes	9	10.00	67	0.37
Year -1 Month 4	Welders	4	10.00	48	0.45
Year -1 Month 4	Welders	14	10.00	42	0.45
Year -1 Month 5	Aerial Lifts	2	10.00	24	0.31
Year -1 Month 5	Air Compressors	5	10.00	50	0.48
Year -1 Month 5	Cranes	8	10.00	226	0.29
Year -1 Month 5	Cranes	2	10.00	62	0.29
Year -1 Month 5	Cranes	1	10.00	150	0.29
Year -1 Month 5	Crawler Tractors	6	10.00	232	0.43
Year -1 Month 5	Crawler Tractors	1	10.00	585	0.43

Year -1 Month 5	Crawler Tractors	1	10.00	207	0.43
Year -1 Month 5	Forklifts	4	10.00	73	0.20
Year -1 Month 5	Generator Sets	5	10.00	18	0.74
Year -1 Month 5	Graders	1	10.00	259	0.41
Year -1 Month 5	Other Construction Equipment	1	10.00	407	0.42
Year -1 Month 5	Other Construction Equipment	2	10.00	180	0.42
Year -1 Month 5	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 5	Other Construction Equipment	4	10.00	50	0.42
Year -1 Month 5	Other Construction Equipment	9	10.00	210	0.42
Year -1 Month 5	Other Construction Equipment	5	10.00	305	0.42
Year -1 Month 5	Other Construction Equipment	17	10.00	130	0.42
Year -1 Month 5	Other Construction Equipment	20	10.00	180	0.42
Year -1 Month 5	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 5	Plate Compactors	2	10.00	33	0.43
Year -1 Month 5	Plate Compactors	2	10.00	14	0.43
Year -1 Month 5	Plate Compactors	1	10.00	3	0.43
Year -1 Month 5	Rubber Tired Loaders	2	10.00	125	0.36
Year -1 Month 5	Rubber Tired Loaders	2	10.00	160	0.36
Year -1 Month 5	Skid Steer Loaders	1	10.00	45	0.37
Year -1 Month 5	Tractors/Loaders/Backhoes	8	10.00	67	0.37
Year -1 Month 5	Welders	7	10.00	48	0.45
Year -1 Month 5	Welders	14	10.00	42	0.45
Year -1 Month 6	Aerial Lifts	2	10.00	24	0.31
Year -1 Month 6	Air Compressors	5	10.00	50	0.48
Year -1 Month 6	Concrete/Industrial Saws	1	10.00	6	0.73
Year -1 Month 6	Concrete/Industrial Saws	1	10.00	20	0.73
Year -1 Month 6	Concrete/Industrial Saws	1	10.00	8	0.73
Year -1 Month 6	Cranes	8	10.00	226	0.29

Year -1 Month 6	Cranes	4	10.00	62	0.29
Year -1 Month 6	Cranes	1	10.00	150	0.29
Year -1 Month 6	Crawler Tractors	6	10.00	232	0.43
Year -1 Month 6	Crawler Tractors	1	10.00	585	0.43
Year -1 Month 6	Crawler Tractors	1	10.00	207	0.43
Year -1 Month 6	Forklifts	4	10.00	73	0.20
Year -1 Month 6	Generator Sets	5	10.00	18	0.74
Year -1 Month 6	Graders	1	10.00	259	0.41
Year -1 Month 6	Other Construction Equipment	1	10.00	407	0.42
Year -1 Month 6	Other Construction Equipment	2	10.00	180	0.42
Year -1 Month 6	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 6	Other Construction Equipment	4	10.00	50	0.42
Year -1 Month 6	Other Construction Equipment	9	10.00	210	0.42
Year -1 Month 6	Other Construction Equipment	6	10.00	305	0.42
Year -1 Month 6	Other Construction Equipment	16	10.00	130	0.42
Year -1 Month 6	Other Construction Equipment	20	10.00	180	0.42
Year -1 Month 6	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 6	Plate Compactors	3	10.00	33	0.43
Year -1 Month 6	Plate Compactors	2	10.00	14	0.43
Year -1 Month 6	Plate Compactors	3	10.00	3	0.43
Year -1 Month 6	Rubber Tired Loaders	2	10.00	125	0.36
Year -1 Month 6	Rubber Tired Loaders	2	10.00	160	0.36
Year -1 Month 6	Rubber Tired Loaders	1	10.00	200	0.36
Year -1 Month 6	Skid Steer Loaders	1	10.00	45	0.37
Year -1 Month 6	Tractors/Loaders/Backhoes	7	10.00	67	0.37
Year -1 Month 6	Tractors/Loaders/Backhoes	1	10.00	100	0.37
Year -1 Month 6	Welders	7	10.00	48	0.45
Year -1 Month 6	Welders	14	10.00	42	0.45

Year -1 Month 7	Aerial Lifts	2	10.00	24	0.31
Year -1 Month 7	Air Compressors	5	10.00	50	0.48
Year -1 Month 7	Concrete/Industrial Saws	1	10.00	6	0.73
Year -1 Month 7	Concrete/Industrial Saws	1	10.00	20	0.73
Year -1 Month 7	Concrete/Industrial Saws	1	10.00	8	0.73
Year -1 Month 7	Cranes	8	10.00	226	0.29
Year -1 Month 7	Cranes	4	10.00	62	0.29
Year -1 Month 7	Cranes	1	10.00	150	0.29
Year -1 Month 7	Crawler Tractors	6	10.00	232	0.43
Year -1 Month 7	Crawler Tractors	1	10.00	585	0.43
Year -1 Month 7	Crawler Tractors	1	10.00	207	0.43
Year -1 Month 7	Forklifts	4	10.00	73	0.20
Year -1 Month 7	Generator Sets	5	10.00	18	0.74
Year -1 Month 7	Graders	1	10.00	259	0.41
Year -1 Month 7	Other Construction Equipment	1	10.00	407	0.42
Year -1 Month 7	Other Construction Equipment	2	10.00	180	0.42
Year -1 Month 7	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 7	Other Construction Equipment	4	10.00	50	0.42
Year -1 Month 7	Other Construction Equipment	9	10.00	210	0.42
Year -1 Month 7	Other Construction Equipment	6	10.00	305	0.42
Year -1 Month 7	Other Construction Equipment	16	10.00	130	0.42
Year -1 Month 7	Other Construction Equipment	20	10.00	180	0.42
Year -1 Month 7	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 7	Plate Compactors	3	10.00	33	0.43
Year -1 Month 7	Plate Compactors	2	10.00	14	0.43
Year -1 Month 7	Plate Compactors	3	10.00	3	0.43
Year -1 Month 7	Rubber Tired Loaders	2	10.00	125	0.36
Year -1 Month 7	Rubber Tired Loaders	2	10.00	160	0.36

Year -1 Month 7	Rubber Tired Loaders	1	10.00	200	0.36
Year -1 Month 7	Skid Steer Loaders	1	10.00	45	0.37
Year -1 Month 7	Tractors/Loaders/Backhoes	7	10.00	67	0.37
Year -1 Month 7	Tractors/Loaders/Backhoes	1	10.00	100	0.37
Year -1 Month 7	Welders	7	10.00	48	0.45
Year -1 Month 7	Welders	14	10.00	42	0.45
Year -1 Month 8	Aerial Lifts	1	10.00	24	0.31
Year -1 Month 8	Air Compressors	3	10.00	50	0.48
Year -1 Month 8	Cranes	8	10.00	226	0.29
Year -1 Month 8	Cranes	5	10.00	62	0.29
Year -1 Month 8	Cranes	1	10.00	150	0.29
Year -1 Month 8	Crawler Tractors	5	10.00	232	0.43
Year -1 Month 8	Crawler Tractors	1	10.00	585	0.43
Year -1 Month 8	Crawler Tractors	1	10.00	207	0.43
Year -1 Month 8	Forklifts	4	10.00	73	0.20
Year -1 Month 8	Generator Sets	3	10.00	18	0.74
Year -1 Month 8	Graders	1	10.00	259	0.41
Year -1 Month 8	Other Construction Equipment	1	10.00	407	0.42
Year -1 Month 8	Other Construction Equipment	2	10.00	180	0.42
Year -1 Month 8	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 8	Other Construction Equipment	4	10.00	50	0.42
Year -1 Month 8	Other Construction Equipment	9	10.00	210	0.42
Year -1 Month 8	Other Construction Equipment	4	10.00	305	0.42
Year -1 Month 8	Other Construction Equipment	15	10.00	130	0.42
Year -1 Month 8	Other Construction Equipment	19	10.00	180	0.42
Year -1 Month 8	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 8	Plate Compactors	1	10.00	33	0.43
Year -1 Month 8	Plate Compactors	2	10.00	14	0.43

Year -1 Month 8	Plate Compactors	1	10.00	3	0.43
Year -1 Month 8	Rubber Tired Loaders	1	10.00	125	0.36
Year -1 Month 8	Rubber Tired Loaders	1	10.00	160	0.36
Year -1 Month 8	Skid Steer Loaders	1	10.00	45	0.37
Year -1 Month 8	Tractors/Loaders/Backhoes	5	10.00	67	0.37
Year -1 Month 8	Welders	7	10.00	48	0.45
Year -1 Month 8	Welders	14	10.00	42	0.45
Year -1 Month 9	Aerial Lifts	1	10.00	24	0.31
Year -1 Month 9	Air Compressors	3	10.00	50	0.48
Year -1 Month 9	Cranes	7	10.00	226	0.29
Year -1 Month 9	Cranes	3	10.00	62	0.29
Year -1 Month 9	Cranes	1	10.00	150	0.29
Year -1 Month 9	Crawler Tractors	5	10.00	232	0.43
Year -1 Month 9	Crawler Tractors	1	10.00	585	0.43
Year -1 Month 9	Crawler Tractors	1	10.00	207	0.43
Year -1 Month 9	Forklifts	3	10.00	73	0.20
Year -1 Month 9	Generator Sets	3	10.00	18	0.74
Year -1 Month 9	Graders	1	10.00	259	0.41
Year -1 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year -1 Month 9	Other Construction Equipment	1	10.00	180	0.42
Year -1 Month 9	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 9	Other Construction Equipment	4	10.00	50	0.42
Year -1 Month 9	Other Construction Equipment	4	10.00	210	0.42
Year -1 Month 9	Other Construction Equipment	4	10.00	305	0.42
Year -1 Month 9	Other Construction Equipment	16	10.00	130	0.42
Year -1 Month 9	Other Construction Equipment	16	10.00	180	0.42
Year -1 Month 9	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 9	Plate Compactors	1	10.00	33	0.43

Year -1 Month 9	Plate Compactors	2	10.00	14	0.43
Year -1 Month 9	Plate Compactors	1	10.00	3	0.43
Year -1 Month 9	Rubber Tired Loaders	1	10.00	125	0.36
Year -1 Month 9	Rubber Tired Loaders	1	10.00	160	0.36
Year -1 Month 9	Skid Steer Loaders	1	10.00	45	0.37
Year -1 Month 9	Tractors/Loaders/Backhoes	5	10.00	67	0.37
Year -1 Month 9	Welders	7	10.00	48	0.45
Year -1 Month 9	Welders	13	10.00	42	0.45
Year -1 Month 10	Aerial Lifts	1	10.00	24	0.31
Year -1 Month 10	Air Compressors	3	10.00	50	0.48
Year -1 Month 10	Cranes	4	10.00	226	0.29
Year -1 Month 10	Cranes	2	10.00	62	0.29
Year -1 Month 10	Crawler Tractors	4	10.00	232	0.43
Year -1 Month 10	Crawler Tractors	1	10.00	585	0.43
Year -1 Month 10	Crawler Tractors	1	10.00	207	0.43
Year -1 Month 10	Forklifts	3	10.00	73	0.20
Year -1 Month 10	Generator Sets	3	10.00	18	0.74
Year -1 Month 10	Graders	1	10.00	259	0.41
Year -1 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year -1 Month 10	Other Construction Equipment	1	10.00	180	0.42
Year -1 Month 10	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 10	Other Construction Equipment	2	10.00	50	0.42
Year -1 Month 10	Other Construction Equipment	4	10.00	210	0.42
Year -1 Month 10	Other Construction Equipment	12	10.00	130	0.42
Year -1 Month 10	Other Construction Equipment	12	10.00	180	0.42
Year -1 Month 10	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 10	Plate Compactors	1	10.00	3	0.43
Year -1 Month 10	Skid Steer Loaders	1	10.00	45	0.37

Year -1 Month 10	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year -1 Month 10	Welders	4	10.00	48	0.45
Year -1 Month 10	Welders	7	10.00	42	0.45
Year -1 Month 11	Aerial Lifts	1	10.00	24	0.31
Year -1 Month 11	Air Compressors	3	10.00	50	0.48
Year -1 Month 11	Cranes	4	10.00	226	0.29
Year -1 Month 11	Cranes	2	10.00	62	0.29
Year -1 Month 11	Forklifts	2	10.00	73	0.20
Year -1 Month 11	Generator Sets	3	10.00	18	0.74
Year -1 Month 11	Other Construction Equipment	1	10.00	180	0.42
Year -1 Month 11	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 11	Other Construction Equipment	2	10.00	50	0.42
Year -1 Month 11	Other Construction Equipment	3	10.00	210	0.42
Year -1 Month 11	Other Construction Equipment	10	10.00	130	0.42
Year -1 Month 11	Other Construction Equipment	9	10.00	180	0.42
Year -1 Month 11	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 11	Plate Compactors	1	10.00	3	0.43
Year -1 Month 11	Skid Steer Loaders	1	10.00	45	0.37
Year -1 Month 11	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year -1 Month 11	Welders	2	10.00	48	0.45
Year -1 Month 11	Welders	7	10.00	42	0.45
Year -1 Month 12	Aerial Lifts	1	10.00	40	0.31
Year -1 Month 12	Aerial Lifts	1	10.00	24	0.31
Year -1 Month 12	Air Compressors	2	10.00	50	0.48
Year -1 Month 12	Cranes	2	10.00	62	0.29
Year -1 Month 12	Forklifts	2	10.00	73	0.20
Year -1 Month 12	Generator Sets	2	10.00	18	0.74
Year -1 Month 12	Other Construction Equipment	1	10.00	180	0.42

Year -1 Month 12	Other Construction Equipment	1	10.00	260	0.42
Year -1 Month 12	Other Construction Equipment	1	10.00	50	0.42
Year -1 Month 12	Other Construction Equipment	2	10.00	210	0.42
Year -1 Month 12	Other Construction Equipment	2	10.00	130	0.42
Year -1 Month 12	Other Construction Equipment	2	10.00	180	0.42
Year -1 Month 12	Other Construction Equipment	1	10.00	273	0.42
Year -1 Month 12	Skid Steer Loaders	1	10.00	45	0.37
Year -1 Month 12	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year -1 Month 12	Welders	1	10.00	48	0.45
Year -1 Month 12	Welders	3	10.00	18	0.45
Year 1 Month 1	Crawler Tractors	1	10.00	232	0.43
Year 1 Month 1	Other Construction Equipment	1	10.00	130	0.42
Year 1 Month 1	Other Construction Equipment	1	10.00	180	0.42
Year 1 Month 1	Rubber Tired Loaders	1	10.00	160	0.36
Year 1 Month 1	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 1 Month 2	Cranes	3	10.00	226	0.29
Year 1 Month 2	Crawler Tractors	1	10.00	232	0.43
Year 1 Month 2	Other Construction Equipment	3	10.00	130	0.42
Year 1 Month 2	Other Construction Equipment	3	10.00	180	0.42
Year 1 Month 2	Rubber Tired Loaders	1	10.00	160	0.36
Year 1 Month 2	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 1 Month 2	Welders	3	10.00	42	0.45
Year 1 Month 3	Cranes	3	10.00	226	0.29
Year 1 Month 3	Other Construction Equipment	2	10.00	130	0.42
Year 1 Month 3	Other Construction Equipment	2	10.00	180	0.42
Year 1 Month 3	Welders	3	10.00	42	0.45
Year 1 Month 4	Cranes	3	10.00	226	0.29
Year 1 Month 4	Cranes	1	10.00	226	0.29

Year 1 Month 4	Other Construction Equipment	2	10.00	130	0.42
Year 1 Month 4	Other Construction Equipment	5	10.00	180	0.42
Year 1 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 1 Month 4	Welders	3	10.00	42	0.45
Year 1 Month 5	Cranes	3	10.00	226	0.29
Year 1 Month 5	Cranes	1	10.00	226	0.29
Year 1 Month 5	Other Construction Equipment	2	10.00	130	0.42
Year 1 Month 5	Other Construction Equipment	5	10.00	180	0.42
Year 1 Month 5	Other Construction Equipment	3	10.00	210	0.42
Year 1 Month 5	Welders	3	10.00	42	0.45
Year 1 Month 6	Cranes	2	10.00	226	0.29
Year 1 Month 6	Cranes	1	10.00	226	0.29
Year 1 Month 6	Other Construction Equipment	2	10.00	130	0.42
Year 1 Month 6	Other Construction Equipment	5	10.00	180	0.42
Year 1 Month 6	Other Construction Equipment	3	10.00	210	0.42
Year 1 Month 6	Welders	2	10.00	42	0.45
Year 1 Month 7	Cranes	2	10.00	226	0.29
Year 1 Month 7	Crawler Tractors	1	10.00	585	0.43
Year 1 Month 7	Crawler Tractors	1	10.00	207	0.43
Year 1 Month 7	Crawler Tractors	3	10.00	232	0.43
Year 1 Month 7	Graders	1	10.00	259	0.41
Year 1 Month 7	Other Construction Equipment	4	10.00	130	0.42
Year 1 Month 7	Other Construction Equipment	2	10.00	180	0.42
Year 1 Month 7	Other Construction Equipment	1	10.00	407	0.42
Year 1 Month 7	Welders	2	10.00	42	0.45
Year 1 Month 8	Cranes	2	10.00	226	0.29
Year 1 Month 8	Crawler Tractors	1	10.00	585	0.43
Year 1 Month 8	Crawler Tractors	1	10.00	207	0.43

Year 1 Month 8	Crawler Tractors	3	10.00	232	0.43
Year 1 Month 8	Graders	1	10.00	259	0.41
Year 1 Month 8	Other Construction Equipment	4	10.00	130	0.42
Year 1 Month 8	Other Construction Equipment	2	10.00	180	0.42
Year 1 Month 8	Other Construction Equipment	1	10.00	407	0.42
Year 1 Month 8	Welders	2	10.00	42	0.45
Year 1 Month 9	Crawler Tractors	1	10.00	585	0.43
Year 1 Month 9	Crawler Tractors	1	10.00	207	0.43
Year 1 Month 9	Crawler Tractors	3	10.00	232	0.43
Year 1 Month 9	Graders	1	10.00	259	0.41
Year 1 Month 9	Other Construction Equipment	2	10.00	130	0.42
Year 1 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year 1 Month 10	Crawler Tractors	1	10.00	585	0.43
Year 1 Month 10	Crawler Tractors	1	10.00	207	0.43
Year 1 Month 10	Crawler Tractors	3	10.00	232	0.43
Year 1 Month 10	Graders	1	10.00	259	0.41
Year 1 Month 10	Other Construction Equipment	2	10.00	130	0.42
Year 1 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year 2 Month 1	Crawler Tractors	1	10.00	232	0.43
Year 2 Month 1	Other Construction Equipment	1	10.00	130	0.42
Year 2 Month 1	Other Construction Equipment	1	10.00	180	0.42
Year 2 Month 1	Rubber Tired Loaders	1	10.00	160	0.36
Year 2 Month 1	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 2 Month 2	Cranes	3	10.00	226	0.29
Year 2 Month 2	Crawler Tractors	1	10.00	232	0.43
Year 2 Month 2	Other Construction Equipment	3	10.00	130	0.42
Year 2 Month 2	Other Construction Equipment	3	10.00	180	0.42
Year 2 Month 2	Rubber Tired Loaders	1	10.00	160	0.36

Year 2 Month 2	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 2 Month 2	Welders	3	10.00	42	0.45
Year 2 Month 3	Cranes	3	10.00	226	0.29
Year 2 Month 3	Crawler Tractors	1	10.00	232	0.43
Year 2 Month 3	Other Construction Equipment	3	10.00	130	0.42
Year 2 Month 3	Other Construction Equipment	3	10.00	180	0.42
Year 2 Month 3	Rubber Tired Loaders	1	10.00	160	0.36
Year 2 Month 3	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 2 Month 3	Welders	3	10.00	42	0.45
Year 2 Month 4	Cranes	3	10.00	226	0.29
Year 2 Month 4	Cranes	1	10.00	226	0.29
Year 2 Month 4	Crawler Tractors	1	10.00	232	0.43
Year 2 Month 4	Other Construction Equipment	3	10.00	130	0.42
Year 2 Month 4	Other Construction Equipment	6	10.00	180	0.42
Year 2 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 2 Month 4	Rubber Tired Loaders	1	10.00	160	0.36
Year 2 Month 4	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 2 Month 4	Welders	3	10.00	42	0.45
Year 2 Month 5	Cranes	3	10.00	226	0.29
Year 2 Month 5	Other Construction Equipment	2	10.00	130	0.42
Year 2 Month 5	Other Construction Equipment	5	10.00	180	0.42
Year 2 Month 5	Other Construction Equipment	3	10.00	210	0.42
Year 2 Month 5	Welders	2	10.00	42	0.45
Year 2 Month 6	Cranes	3	10.00	226	0.29
Year 2 Month 6	Other Construction Equipment	2	10.00	130	0.42
Year 2 Month 6	Other Construction Equipment	5	10.00	180	0.42
Year 2 Month 6	Other Construction Equipment	3	10.00	210	0.42
Year 2 Month 6	Welders	2	10.00	42	0.45

Year 2 Month 7	Cranes	2	10.00	226	0.29
Year 2 Month 7	Other Construction Equipment	2	10.00	130	0.42
Year 2 Month 7	Other Construction Equipment	2	10.00	180	0.42
Year 2 Month 7	Welders	2	10.00	42	0.45
Year 2 Month 8	Cranes	2	10.00	226	0.29
Year 2 Month 8	Crawler Tractors	1	10.00	585	0.43
Year 2 Month 8	Crawler Tractors	1	10.00	207	0.43
Year 2 Month 8	Crawler Tractors	4	10.00	232	0.43
Year 2 Month 8	Graders	1	10.00	259	0.41
Year 2 Month 8	Other Construction Equipment	4	10.00	130	0.42
Year 2 Month 8	Other Construction Equipment	2	10.00	180	0.42
Year 2 Month 8	Other Construction Equipment	1	10.00	407	0.42
Year 2 Month 8	Welders	2	10.00	42	0.45
Year 2 Month 9	Crawler Tractors	1	10.00	585	0.43
Year 2 Month 9	Crawler Tractors	1	10.00	207	0.43
Year 2 Month 9	Crawler Tractors	4	10.00	232	0.43
Year 2 Month 9	Graders	1	10.00	259	0.41
Year 2 Month 9	Other Construction Equipment	2	10.00	130	0.42
Year 2 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year 2 Month 10	Crawler Tractors	1	10.00	585	0.43
Year 2 Month 10	Crawler Tractors	1	10.00	207	0.43
Year 2 Month 10	Crawler Tractors	4	10.00	232	0.43
Year 2 Month 10	Graders	1	10.00	259	0.41
Year 2 Month 10	Other Construction Equipment	2	10.00	130	0.42
Year 2 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year 3 Month 4	Cranes	1	10.00	226	0.29
Year 3 Month 4	Other Construction Equipment	3	10.00	180	0.42
Year 3 Month 4	Other Construction Equipment	3	10.00	210	0.42

Year 3 Month 5	Cranes	1	10.00	226	0.29
Year 3 Month 5	Other Construction Equipment	3	10.00	180	0.42
Year 3 Month 5	Other Construction Equipment	3	10.00	210	0.42
Year 3 Month 6	Cranes	1	10.00	226	0.29
Year 3 Month 6	Other Construction Equipment	3	10.00	180	0.42
Year 3 Month 6	Other Construction Equipment	3	10.00	210	0.42
Year 3 Month 7	Other Construction Equipment	0	10.00	180	0.42
Year 3 Month 8	Crawler Tractors	1	10.00	585	0.43
Year 3 Month 8	Crawler Tractors	1	10.00	207	0.43
Year 3 Month 8	Crawler Tractors	4	10.00	232	0.43
Year 3 Month 8	Graders	1	10.00	259	0.41
Year 3 Month 8	Other Construction Equipment	2	10.00	130	0.42
Year 3 Month 8	Other Construction Equipment	1	10.00	407	0.42
Year 3 Month 9	Crawler Tractors	1	10.00	585	0.43
Year 3 Month 9	Crawler Tractors	1	10.00	207	0.43
Year 3 Month 9	Crawler Tractors	4	10.00	232	0.43
Year 3 Month 9	Graders	1	10.00	259	0.41
Year 3 Month 9	Other Construction Equipment	2	10.00	130	0.42
Year 3 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year 3 Month 10	Crawler Tractors	1	10.00	585	0.43
Year 3 Month 10	Crawler Tractors	1	10.00	207	0.43
Year 3 Month 10	Crawler Tractors	4	10.00	232	0.43
Year 3 Month 10	Graders	1	10.00	259	0.41
Year 3 Month 10	Other Construction Equipment	2	10.00	130	0.42
Year 3 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year 4 Month 1	Excavators	1	10.00	42	0.38
Year 4 Month 1	Excavators	1	10.00	176	0.38
Year 4 Month 1	Generator Sets	1	10.00	18	0.74

Year 4 Month 1	Other Construction Equipment	3	10.00	130	0.42
Year 4 Month 1	Other Construction Equipment	1	10.00	210	0.42
Year 4 Month 1	Plate Compactors	2	10.00	3	0.43
Year 4 Month 1	Plate Compactors	2	10.00	33	0.43
Year 4 Month 1	Rubber Tired Loaders	1	10.00	200	0.36
Year 4 Month 1	Tractors/Loaders/Backhoes	2	10.00	100	0.37
Year 4 Month 2	Air Compressors	1	10.00	50	0.48
Year 4 Month 2	Excavators	1	10.00	42	0.38
Year 4 Month 2	Excavators	1	10.00	176	0.38
Year 4 Month 2	Generator Sets	1	10.00	18	0.74
Year 4 Month 2	Other Construction Equipment	4	10.00	130	0.42
Year 4 Month 2	Other Construction Equipment	1	10.00	210	0.42
Year 4 Month 2	Plate Compactors	2	10.00	3	0.43
Year 4 Month 2	Plate Compactors	2	10.00	33	0.43
Year 4 Month 2	Rubber Tired Loaders	1	10.00	200	0.36
Year 4 Month 2	Tractors/Loaders/Backhoes	2	10.00	100	0.37
Year 4 Month 3	Air Compressors	1	10.00	50	0.48
Year 4 Month 3	Generator Sets	1	10.00	18	0.74
Year 4 Month 3	Other Construction Equipment	4	10.00	130	0.42
Year 4 Month 3	Other Construction Equipment	1	10.00	210	0.42
Year 4 Month 4	Aerial Lifts	1	10.00	24	0.31
Year 4 Month 4	Air Compressors	3	10.00	50	0.48
Year 4 Month 4	Cranes	1	10.00	226	0.29
Year 4 Month 4	Cranes	1	10.00	62	0.29
Year 4 Month 4	Cranes	1	10.00	150	0.29
Year 4 Month 4	Forklifts	2	10.00	73	0.20
Year 4 Month 4	Generator Sets	3	10.00	18	0.74
Year 4 Month 4	Other Construction Equipment	4	10.00	180	0.42

Year 4 Month 4	Other Construction Equipment	5	10.00	210	0.42
Year 4 Month 4	Other Construction Equipment	2	10.00	50	0.42
Year 4 Month 4	Other Construction Equipment	2	10.00	305	0.42
Year 4 Month 4	Other Construction Equipment	3	10.00	130	0.42
Year 4 Month 4	Other Construction Equipment	1	10.00	273	0.42
Year 4 Month 4	Plate Compactors	1	10.00	14	0.43
Year 4 Month 4	Plate Compactors	1	10.00	3	0.43
Year 4 Month 4	Rubber Tired Loaders	1	10.00	125	0.36
Year 4 Month 4	Skid Steer Loaders	1	10.00	45	0.37
Year 4 Month 4	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 4 Month 4	Welders	2	10.00	48	0.45
Year 4 Month 5	Aerial Lifts	1	10.00	24	0.31
Year 4 Month 5	Air Compressors	3	10.00	50	0.48
Year 4 Month 5	Concrete/Industrial Saws	1	10.00	6	0.73
Year 4 Month 5	Concrete/Industrial Saws	1	10.00	20	0.73
Year 4 Month 5	Concrete/Industrial Saws	1	10.00	8	0.73
Year 4 Month 5	Cranes	1	10.00	62	0.29
Year 4 Month 5	Cranes	1	10.00	150	0.29
Year 4 Month 5	Forklifts	2	10.00	73	0.20
Year 4 Month 5	Generator Sets	3	10.00	18	0.74
Year 4 Month 5	Other Construction Equipment	3	10.00	180	0.42
Year 4 Month 5	Other Construction Equipment	4	10.00	210	0.42
Year 4 Month 5	Other Construction Equipment	2	10.00	50	0.42
Year 4 Month 5	Other Construction Equipment	2	10.00	305	0.42
Year 4 Month 5	Other Construction Equipment	2	10.00	130	0.42
Year 4 Month 5	Other Construction Equipment	1	10.00	273	0.42
Year 4 Month 5	Plate Compactors	1	10.00	33	0.43
Year 4 Month 5	Plate Compactors	1	10.00	14	0.43

Year 4 Month 5	Plate Compactors	3	10.00	3	0.43
Year 4 Month 5	Rubber Tired Loaders	1	10.00	125	0.36
Year 4 Month 5	Rubber Tired Loaders	1	10.00	200	0.36
Year 4 Month 5	Skid Steer Loaders	1	10.00	45	0.37
Year 4 Month 5	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 4 Month 5	Tractors/Loaders/Backhoes	1	10.00	100	0.37
Year 4 Month 5	Welders	4	10.00	48	0.45
Year 4 Month 6	Aerial Lifts	1	10.00	24	0.31
Year 4 Month 6	Air Compressors	3	10.00	50	0.48
Year 4 Month 6	Concrete/Industrial Saws	1	10.00	6	0.73
Year 4 Month 6	Concrete/Industrial Saws	1	10.00	20	0.73
Year 4 Month 6	Concrete/Industrial Saws	1	10.00	8	0.73
Year 4 Month 6	Cranes	2	10.00	62	0.29
Year 4 Month 6	Cranes	1	10.00	150	0.29
Year 4 Month 6	Forklifts	2	10.00	73	0.20
Year 4 Month 6	Generator Sets	3	10.00	18	0.74
Year 4 Month 6	Other Construction Equipment	3	10.00	180	0.42
Year 4 Month 6	Other Construction Equipment	4	10.00	210	0.42
Year 4 Month 6	Other Construction Equipment	2	10.00	50	0.42
Year 4 Month 6	Other Construction Equipment	3	10.00	305	0.42
Year 4 Month 6	Other Construction Equipment	2	10.00	130	0.42
Year 4 Month 6	Other Construction Equipment	1	10.00	273	0.42
Year 4 Month 6	Plate Compactors	1	10.00	33	0.43
Year 4 Month 6	Plate Compactors	1	10.00	14	0.43
Year 4 Month 6	Plate Compactors	3	10.00	3	0.43
Year 4 Month 6	Rubber Tired Loaders	1	10.00	125	0.36
Year 4 Month 6	Rubber Tired Loaders	1	10.00	200	0.36
Year 4 Month 6	Skid Steer Loaders	1	10.00	45	0.37

Year 4 Month 6	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 4 Month 6	Tractors/Loaders/Backhoes	1	10.00	100	0.37
Year 4 Month 6	Welders	4	10.00	48	0.45
Year 4 Month 7	Aerial Lifts	1	10.00	24	0.31
Year 4 Month 7	Air Compressors	3	10.00	50	0.48
Year 4 Month 7	Cranes	3	10.00	62	0.29
Year 4 Month 7	Cranes	1	10.00	150	0.29
Year 4 Month 7	Forklifts	2	10.00	73	0.20
Year 4 Month 7	Generator Sets	3	10.00	18	0.74
Year 4 Month 7	Other Construction Equipment	3	10.00	180	0.42
Year 4 Month 7	Other Construction Equipment	4	10.00	210	0.42
Year 4 Month 7	Other Construction Equipment	2	10.00	50	0.42
Year 4 Month 7	Other Construction Equipment	3	10.00	305	0.42
Year 4 Month 7	Other Construction Equipment	2	10.00	130	0.42
Year 4 Month 7	Other Construction Equipment	1	10.00	273	0.42
Year 4 Month 7	Plate Compactors	1	10.00	14	0.43
Year 4 Month 7	Plate Compactors	1	10.00	3	0.43
Year 4 Month 7	Rubber Tired Loaders	1	10.00	125	0.36
Year 4 Month 7	Skid Steer Loaders	1	10.00	45	0.37
Year 4 Month 7	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 4 Month 7	Welders	4	10.00	48	0.45
Year 4 Month 8	Aerial Lifts	1	10.00	24	0.31
Year 4 Month 8	Air Compressors	2	10.00	50	0.48
Year 4 Month 8	Cranes	3	10.00	62	0.29
Year 4 Month 8	Cranes	1	10.00	150	0.29
Year 4 Month 8	Crawler Tractors	4	10.00	232	0.43
Year 4 Month 8	Crawler Tractors	1	10.00	585	0.43
Year 4 Month 8	Crawler Tractors	1	10.00	207	0.43

Year 4 Month 8	Forklifts	2	10.00	73	0.20
Year 4 Month 8	Generator Sets	2	10.00	18	0.74
Year 4 Month 8	Graders	1	10.00	259	0.41
Year 4 Month 8	Other Construction Equipment	1	10.00	407	0.42
Year 4 Month 8	Other Construction Equipment	3	10.00	180	0.42
Year 4 Month 8	Other Construction Equipment	5	10.00	210	0.42
Year 4 Month 8	Other Construction Equipment	2	10.00	50	0.42
Year 4 Month 8	Other Construction Equipment	2	10.00	305	0.42
Year 4 Month 8	Other Construction Equipment	5	10.00	130	0.42
Year 4 Month 8	Other Construction Equipment	1	10.00	273	0.42
Year 4 Month 8	Plate Compactors	1	10.00	14	0.43
Year 4 Month 8	Plate Compactors	1	10.00	3	0.43
Year 4 Month 8	Rubber Tired Loaders	1	10.00	125	0.36
Year 4 Month 8	Skid Steer Loaders	1	10.00	45	0.37
Year 4 Month 8	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 4 Month 8	Welders	4	10.00	48	0.45
Year 4 Month 9	Aerial Lifts	1	10.00	24	0.31
Year 4 Month 9	Air Compressors	2	10.00	50	0.48
Year 4 Month 9	Cranes	1	10.00	62	0.29
Year 4 Month 9	Cranes	1	10.00	150	0.29
Year 4 Month 9	Crawler Tractors	4	10.00	232	0.43
Year 4 Month 9	Crawler Tractors	1	10.00	585	0.43
Year 4 Month 9	Crawler Tractors	1	10.00	207	0.43
Year 4 Month 9	Forklifts	2	10.00	73	0.20
Year 4 Month 9	Generator Sets	2	10.00	18	0.74
Year 4 Month 9	Graders	1	10.00	259	0.41
Year 4 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year 4 Month 9	Other Construction Equipment	3	10.00	180	0.42

Year 4 Month 9	Other Construction Equipment	4	10.00	210	0.42
Year 4 Month 9	Other Construction Equipment	2	10.00	50	0.42
Year 4 Month 9	Other Construction Equipment	2	10.00	305	0.42
Year 4 Month 9	Other Construction Equipment	5	10.00	130	0.42
Year 4 Month 9	Other Construction Equipment	1	10.00	273	0.42
Year 4 Month 9	Plate Compactors	1	10.00	14	0.43
Year 4 Month 9	Plate Compactors	1	10.00	3	0.43
Year 4 Month 9	Rubber Tired Loaders	1	10.00	125	0.36
Year 4 Month 9	Skid Steer Loaders	1	10.00	45	0.37
Year 4 Month 9	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 4 Month 9	Welders	4	10.00	48	0.45
Year 4 Month 10	Aerial Lifts	1	10.00	24	0.31
Year 4 Month 10	Air Compressors	2	10.00	50	0.48
Year 4 Month 10	Cranes	1	10.00	62	0.29
Year 4 Month 10	Crawler Tractors	4	10.00	232	0.43
Year 4 Month 10	Crawler Tractors	1	10.00	585	0.43
Year 4 Month 10	Crawler Tractors	1	10.00	207	0.43
Year 4 Month 10	Forklifts	2	10.00	73	0.20
Year 4 Month 10	Generator Sets	2	10.00	18	0.74
Year 4 Month 10	Graders	1	10.00	259	0.41
Year 4 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year 4 Month 10	Other Construction Equipment	3	10.00	180	0.42
Year 4 Month 10	Other Construction Equipment	4	10.00	210	0.42
Year 4 Month 10	Other Construction Equipment	1	10.00	50	0.42
Year 4 Month 10	Other Construction Equipment	5	10.00	130	0.42
Year 4 Month 10	Other Construction Equipment	1	10.00	273	0.42
Year 4 Month 10	Plate Compactors	1	10.00	3	0.43
Year 4 Month 10	Skid Steer Loaders	1	10.00	45	0.37

Year 4 Month 10	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 4 Month 10	Welders	2	10.00	48	0.45
Year 4 Month 11	Aerial Lifts	1	10.00	60	0.31
Year 4 Month 11	Aerial Lifts	1	10.00	24	0.31
Year 4 Month 11	Air Compressors	2	10.00	50	0.48
Year 4 Month 11	Cranes	1	10.00	62	0.29
Year 4 Month 11	Forklifts	2	10.00	73	0.20
Year 4 Month 11	Generator Sets	2	10.00	18	0.74
Year 4 Month 11	Other Construction Equipment	2	10.00	180	0.42
Year 4 Month 11	Other Construction Equipment	3	10.00	210	0.42
Year 4 Month 11	Other Construction Equipment	1	10.00	50	0.42
Year 4 Month 11	Other Construction Equipment	2	10.00	130	0.42
Year 4 Month 11	Other Construction Equipment	1	10.00	273	0.42
Year 4 Month 11	Plate Compactors	1	10.00	3	0.43
Year 4 Month 11	Skid Steer Loaders	1	10.00	45	0.37
Year 4 Month 11	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 4 Month 11	Welders	3	10.00	18	0.45
Year 4 Month 11	Welders	1	10.00	48	0.45
Year 4 Month 12	Aerial Lifts	1	10.00	24	0.31
Year 4 Month 12	Air Compressors	1	10.00	50	0.48
Year 4 Month 12	Cranes	1	10.00	62	0.29
Year 4 Month 12	Forklifts	2	10.00	73	0.20
Year 4 Month 12	Generator Sets	1	10.00	18	0.74
Year 4 Month 12	Other Construction Equipment	2	10.00	180	0.42
Year 4 Month 12	Other Construction Equipment	3	10.00	210	0.42
Year 4 Month 12	Other Construction Equipment	1	10.00	50	0.42
Year 4 Month 12	Other Construction Equipment	1	10.00	273	0.42
Year 4 Month 12	Skid Steer Loaders	1	10.00	45	0.37

Year 4 Month 12	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 4 Month 12	Welders	1	10.00	48	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Year -3 Month 1	12	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 2	12	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 3	12	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 4	12	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 5	12	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 6	12	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 7	24	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 8	24	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 9	12	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 10	12	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 11	12	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 12	12	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -2 Month 1	35	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -2 Month 2	45	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -2 Month 3	71	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -2 Month 4	72	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -2 Month 5	78	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -2 Month 6	82	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -2 Month 7	75	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -2 Month 8	67	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -2 Month 9	53	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -2 Month 10	40	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

Year -2 Month 11	23	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -2 Month 12	18	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 1	36	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 2	74	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 3	130	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 4	129	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 5	135	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 6	144	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 7	144	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 8	122	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 9	109	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 10	71	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 11	54	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1 Month 12	26	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 1 Month 1	5	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 1 Month 2	15	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 1 Month 3	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 1 Month 4	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 1 Month 5	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 1 Month 6	15	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 1 Month 7	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 1 Month 8	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 1 Month 9	9	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 1 Month 10	9	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 1 Month 11				0.00	12.30	4.60				
Year 1 Month 12				0.00	12.30	4.60				
Year 2 Month 1	5	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 2 Month 2	15	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

Year 2 Month 3	15	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 2 Month 4	22	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 2 Month 5	15	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 2 Month 6	15	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 2 Month 7	8	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 2 Month 8	18	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 2 Month 9	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 2 Month 10	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 2 Month 11				0.00	12.30	4.60				
Year 2 Month 12				0.00	12.30	4.60				
Year 3 Month 1				0.00	12.30	4.60				
Year 3 Month 2				0.00	12.30	4.60				
Year 3 Month 3				0.00	12.30	4.60				
Year 3 Month 4	7	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 3 Month 5	7	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 3 Month 6	7	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 3 Month 7	0	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 3 Month 8	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 3 Month 9	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 3 Month 10	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 3 Month 11				0.00	12.30	4.60				
Year 3 Month 12				0.00	12.30	4.60				
Year 4 Month 1	14	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 4 Month 2	16	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 4 Month 3	7	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 4 Month 4	36	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 4 Month 5	42	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 4 Month 6	44	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

Year 4 Month 7	37	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 4 Month 8	46	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 4 Month 9	43	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 4 Month 10	35	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 4 Month 11	25	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 4 Month 12	16	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Year -3 Month 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863
Total	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863

3.2 Year -3 Month 1 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861
Total	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861

3.2 Year -3 Month 1 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.3 Year -3 Month 2 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1239	1.5594	0.6238	1.5500e-003		0.0626	0.0626		0.0576	0.0576	0.0000	143.2573	143.2573	0.0436	0.0000	144.1719
Total	0.1239	1.5594	0.6238	1.5500e-003		0.0626	0.0626		0.0576	0.0576	0.0000	143.2573	143.2573	0.0436	0.0000	144.1719

3.3 Year -3 Month 2 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0187	0.0812	0.7521	1.5500e-003		2.5000e-003	2.5000e-003		2.5000e-003	2.5000e-003	0.0000	143.2571	143.2571	0.0436	0.0000	144.1718
Total	0.0187	0.0812	0.7521	1.5500e-003		2.5000e-003	2.5000e-003		2.5000e-003	2.5000e-003	0.0000	143.2571	143.2571	0.0436	0.0000	144.1718

3.3 Year -3 Month 2 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.4 Year -3 Month 3 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1394	1.7543	0.7017	1.7400e-003		0.0704	0.0704		0.0648	0.0648	0.0000	161.1645	161.1645	0.0490	0.0000	162.1934
Total	0.1394	1.7543	0.7017	1.7400e-003		0.0704	0.0704		0.0648	0.0648	0.0000	161.1645	161.1645	0.0490	0.0000	162.1934

3.4 Year -3 Month 3 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0211	0.0914	0.8461	1.7400e-003		2.8100e-003	2.8100e-003		2.8100e-003	2.8100e-003	0.0000	161.1643	161.1643	0.0490	0.0000	162.1932
Total	0.0211	0.0914	0.8461	1.7400e-003		2.8100e-003	2.8100e-003		2.8100e-003	2.8100e-003	0.0000	161.1643	161.1643	0.0490	0.0000	162.1932

3.4 Year -3 Month 3 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.5 Year -3 Month 4 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1291	1.6244	0.6497	1.6100e-003		0.0652	0.0652		0.0600	0.0600	0.0000	149.2263	149.2263	0.0454	0.0000	150.1791
Total	0.1291	1.6244	0.6497	1.6100e-003		0.0652	0.0652		0.0600	0.0600	0.0000	149.2263	149.2263	0.0454	0.0000	150.1791

3.5 Year -3 Month 4 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0195	0.0846	0.7834	1.6100e-003		2.6000e-003	2.6000e-003		2.6000e-003	2.6000e-003	0.0000	149.2262	149.2262	0.0454	0.0000	150.1789
Total	0.0195	0.0846	0.7834	1.6100e-003		2.6000e-003	2.6000e-003		2.6000e-003	2.6000e-003	0.0000	149.2262	149.2262	0.0454	0.0000	150.1789

3.5 Year -3 Month 4 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.6 Year -3 Month 5 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1394	1.7543	0.7017	1.7400e-003		0.0704	0.0704		0.0648	0.0648	0.0000	161.1645	161.1645	0.0490	0.0000	162.1934
Total	0.1394	1.7543	0.7017	1.7400e-003		0.0704	0.0704		0.0648	0.0648	0.0000	161.1645	161.1645	0.0490	0.0000	162.1934

3.6 Year -3 Month 5 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0211	0.0914	0.8461	1.7400e-003		2.8100e-003	2.8100e-003		2.8100e-003	2.8100e-003	0.0000	161.1643	161.1643	0.0490	0.0000	162.1932
Total	0.0211	0.0914	0.8461	1.7400e-003		2.8100e-003	2.8100e-003		2.8100e-003	2.8100e-003	0.0000	161.1643	161.1643	0.0490	0.0000	162.1932

3.6 Year -3 Month 5 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.7 Year -3 Month 6 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863
Total	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863

3.7 Year -3 Month 6 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861
Total	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861

3.7 Year -3 Month 6 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.8 Year -3 Month 7 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2684	3.3787	1.3515	3.3600e-003		0.1356	0.1356		0.1249	0.1249	0.0000	310.3908	310.3908	0.0944	0.0000	312.3725
Total	0.2684	3.3787	1.3515	3.3600e-003		0.1356	0.1356		0.1249	0.1249	0.0000	310.3908	310.3908	0.0944	0.0000	312.3725

3.8 Year -3 Month 7 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0406	0.1759	1.6295	3.3600e-003		5.4100e-003	5.4100e-003		5.4100e-003	5.4100e-003	0.0000	310.3904	310.3904	0.0944	0.0000	312.3722
Total	0.0406	0.1759	1.6295	3.3600e-003		5.4100e-003	5.4100e-003		5.4100e-003	5.4100e-003	0.0000	310.3904	310.3904	0.0944	0.0000	312.3722

3.8 Year -3 Month 7 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.9 Year -3 Month 8 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2788	3.5086	1.4034	3.4900e-003		0.1408	0.1408		0.1297	0.1297	0.0000	322.3289	322.3289	0.0980	0.0000	324.3869
Total	0.2788	3.5086	1.4034	3.4900e-003		0.1408	0.1408		0.1297	0.1297	0.0000	322.3289	322.3289	0.0980	0.0000	324.3869

3.9 Year -3 Month 8 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0422	0.1827	1.6922	3.4900e-003		5.6200e-003	5.6200e-003		5.6200e-003	5.6200e-003	0.0000	322.3285	322.3285	0.0980	0.0000	324.3865
Total	0.0422	0.1827	1.6922	3.4900e-003		5.6200e-003	5.6200e-003		5.6200e-003	5.6200e-003	0.0000	322.3285	322.3285	0.0980	0.0000	324.3865

3.9 Year -3 Month 8 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.10 Year -3 Month 9 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863
Total	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863

3.10 Year -3 Month 9 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861
Total	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861

3.10 Year -3 Month 9 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.11 Year -3 Month 10 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863
Total	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863

3.11 Year -3 Month 10 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861
Total	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861

3.11 Year -3 Month 10 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.12 Year -3 Month 11 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863
Total	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863

3.12 Year -3 Month 11 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861
Total	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861

3.12 Year -3 Month 11 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.13 Year -3 Month 12 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863
Total	0.1342	1.6893	0.6757	1.6800e-003		0.0678	0.0678		0.0624	0.0624	0.0000	155.1954	155.1954	0.0472	0.0000	156.1863

3.13 Year -3 Month 12 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861
Total	0.0203	0.0880	0.8148	1.6800e-003		2.7100e-003	2.7100e-003		2.7100e-003	2.7100e-003	0.0000	155.1952	155.1952	0.0472	0.0000	156.1861

3.13 Year -3 Month 12 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.14 Year -2 Month 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2030	2.1372	1.1172	2.4200e-003		0.0972	0.0972		0.0899	0.0899	0.0000	218.4307	218.4307	0.0667	0.0000	219.8316
Total	0.2030	2.1372	1.1172	2.4200e-003		0.0972	0.0972		0.0899	0.0899	0.0000	218.4307	218.4307	0.0667	0.0000	219.8316

3.14 Year -2 Month 1 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0327	0.2850	1.2762	2.4200e-003		3.8400e-003	3.8400e-003		3.8400e-003	3.8400e-003	0.0000	218.4304	218.4304	0.0667	0.0000	219.8313
Total	0.0327	0.2850	1.2762	2.4200e-003		3.8400e-003	3.8400e-003		3.8400e-003	3.8400e-003	0.0000	218.4304	218.4304	0.0667	0.0000	219.8313

3.14 Year -2 Month 1 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.15 Year -2 Month 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2220	2.1930	1.2073	2.4400e-003		0.1058	0.1058		0.0981	0.0981	0.0000	218.3988	218.3988	0.0657	0.0000	219.7785
Total	0.2220	2.1930	1.2073	2.4400e-003		0.1058	0.1058		0.0981	0.0981	0.0000	218.3988	218.3988	0.0657	0.0000	219.7785

3.15 Year -2 Month 2 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0340	0.3547	1.3120	2.4400e-003		3.7900e-003	3.7900e-003		3.7900e-003	3.7900e-003	0.0000	218.3986	218.3986	0.0657	0.0000	219.7782
Total	0.0340	0.3547	1.3120	2.4400e-003		3.7900e-003	3.7900e-003		3.7900e-003	3.7900e-003	0.0000	218.3986	218.3986	0.0657	0.0000	219.7782

3.15 Year -2 Month 2 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.16 Year -2 Month 3 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4529	4.5376	2.4769	5.4500e-003		0.2064	0.2064		0.1916	0.1916	0.0000	488.3157	488.3157	0.1471	0.0000	491.4044
Total	0.4529	4.5376	2.4769	5.4500e-003		0.2064	0.2064		0.1916	0.1916	0.0000	488.3157	488.3157	0.1471	0.0000	491.4044

3.16 Year -2 Month 3 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0722	0.6343	2.7676	5.4500e-003		8.4800e-003	8.4800e-003		8.4800e-003	8.4800e-003	0.0000	488.3151	488.3151	0.1471	0.0000	491.4038
Total	0.0722	0.6343	2.7676	5.4500e-003		8.4800e-003	8.4800e-003		8.4800e-003	8.4800e-003	0.0000	488.3151	488.3151	0.1471	0.0000	491.4038

3.16 Year -2 Month 3 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.17 Year -2 Month 4 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4197	4.2081	2.2998	5.0600e-003		0.1913	0.1913		0.1775	0.1775	0.0000	453.1588	453.1588	0.1365	0.0000	456.0253
Total	0.4197	4.2081	2.2998	5.0600e-003		0.1913	0.1913		0.1775	0.1775	0.0000	453.1588	453.1588	0.1365	0.0000	456.0253

3.17 Year -2 Month 4 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0669	0.5873	2.5626	5.0600e-003		7.8500e-003	7.8500e-003		7.8500e-003	7.8500e-003	0.0000	453.1583	453.1583	0.1365	0.0000	456.0248
Total	0.0669	0.5873	2.5626	5.0600e-003		7.8500e-003	7.8500e-003		7.8500e-003	7.8500e-003	0.0000	453.1583	453.1583	0.1365	0.0000	456.0248

3.17 Year -2 Month 4 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.18 Year -2 Month 5 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4831	4.7237	2.6239	5.7500e-003		0.2148	0.2148		0.1998	0.1998	0.0000	513.1110	513.1110	0.1536	0.0000	516.3368
Total	0.4831	4.7237	2.6239	5.7500e-003		0.2148	0.2148		0.1998	0.1998	0.0000	513.1110	513.1110	0.1536	0.0000	516.3368

3.18 Year -2 Month 5 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0760	0.6771	2.9033	5.7500e-003		8.8800e-003	8.8800e-003		8.8800e-003	8.8800e-003	0.0000	513.1104	513.1104	0.1536	0.0000	516.3362
Total	0.0760	0.6771	2.9033	5.7500e-003		8.8800e-003	8.8800e-003		8.8800e-003	8.8800e-003	0.0000	513.1104	513.1104	0.1536	0.0000	516.3362

3.18 Year -2 Month 5 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.19 Year -2 Month 6 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4937	4.8619	2.6817	5.8600e-003		0.2220	0.2220		0.2064	0.2064	0.0000	523.9949	523.9949	0.1572	0.0000	527.2967
Total	0.4937	4.8619	2.6817	5.8600e-003		0.2220	0.2220		0.2064	0.2064	0.0000	523.9949	523.9949	0.1572	0.0000	527.2967

3.19 Year -2 Month 6 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0778	0.6950	2.9585	5.8600e-003		9.0800e-003	9.0800e-003		9.0800e-003	9.0800e-003	0.0000	523.9943	523.9943	0.1572	0.0000	527.2961
Total	0.0778	0.6950	2.9585	5.8600e-003		9.0800e-003	9.0800e-003		9.0800e-003	9.0800e-003	0.0000	523.9943	523.9943	0.1572	0.0000	527.2961

3.19 Year -2 Month 6 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.20 Year -2 Month 7 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4595	4.5074	2.4663	5.5300e-003		0.2028	0.2028		0.1887	0.1887	0.0000	493.5179	493.5179	0.1477	0.0000	496.6204
Total	0.4595	4.5074	2.4663	5.5300e-003		0.2028	0.2028		0.1887	0.1887	0.0000	493.5179	493.5179	0.1477	0.0000	496.6204

3.20 Year -2 Month 7 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0727	0.6355	2.7347	5.5300e-003		8.5400e-003	8.5400e-003		8.5400e-003	8.5400e-003	0.0000	493.5173	493.5173	0.1477	0.0000	496.6198
Total	0.0727	0.6355	2.7347	5.5300e-003		8.5400e-003	8.5400e-003		8.5400e-003	8.5400e-003	0.0000	493.5173	493.5173	0.1477	0.0000	496.6198

3.20 Year -2 Month 7 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.21 Year -2 Month 8 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4271	4.2695	2.2724	5.1300e-003		0.1920	0.1920		0.1783	0.1783	0.0000	459.8755	459.8755	0.1386	0.0000	462.7862
Total	0.4271	4.2695	2.2724	5.1300e-003		0.1920	0.1920		0.1783	0.1783	0.0000	459.8755	459.8755	0.1386	0.0000	462.7862

3.21 Year -2 Month 8 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0684	0.5975	2.5697	5.1300e-003		8.0400e-003	8.0400e-003		8.0400e-003	8.0400e-003	0.0000	459.8749	459.8749	0.1386	0.0000	462.7857
Total	0.0684	0.5975	2.5697	5.1300e-003		8.0400e-003	8.0400e-003		8.0400e-003	8.0400e-003	0.0000	459.8749	459.8749	0.1386	0.0000	462.7857

3.21 Year -2 Month 8 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.22 Year -2 Month 9 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2985	2.7936	1.5884	3.4500e-003		0.1286	0.1286		0.1198	0.1198	0.0000	307.1711	307.1711	0.0914	0.0000	309.0906
Total	0.2985	2.7936	1.5884	3.4500e-003		0.1286	0.1286		0.1198	0.1198	0.0000	307.1711	307.1711	0.0914	0.0000	309.0906

3.22 Year -2 Month 9 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0465	0.4494	1.7276	3.4500e-003		5.3100e-003	5.3100e-003		5.3100e-003	5.3100e-003	0.0000	307.1707	307.1707	0.0914	0.0000	309.0902
Total	0.0465	0.4494	1.7276	3.4500e-003		5.3100e-003	5.3100e-003		5.3100e-003	5.3100e-003	0.0000	307.1707	307.1707	0.0914	0.0000	309.0902

3.22 Year -2 Month 9 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.23 Year -2 Month 10 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2192	2.0807	1.1068	2.4000e-003		0.0964	0.0964		0.0898	0.0898	0.0000	212.9760	212.9760	0.0632	0.0000	214.3022
Total	0.2192	2.0807	1.1068	2.4000e-003		0.0964	0.0964		0.0898	0.0898	0.0000	212.9760	212.9760	0.0632	0.0000	214.3022

3.23 Year -2 Month 10 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0328	0.3390	1.2010	2.4000e-003		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	212.9757	212.9757	0.0632	0.0000	214.3019
Total	0.0328	0.3390	1.2010	2.4000e-003		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	212.9757	212.9757	0.0632	0.0000	214.3019

3.23 Year -2 Month 10 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.24 Year -2 Month 11 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0809	0.5035	0.4126	6.3000e-004		0.0317	0.0317		0.0300	0.0300	0.0000	53.0072	53.0072	0.0142	0.0000	53.3060
Total	0.0809	0.5035	0.4126	6.3000e-004		0.0317	0.0317		0.0300	0.0300	0.0000	53.0072	53.0072	0.0142	0.0000	53.3060

3.24 Year -2 Month 11 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0102	0.1970	0.3335	6.3000e-004		8.1000e-004	8.1000e-004		8.1000e-004	8.1000e-004	0.0000	53.0071	53.0071	0.0142	0.0000	53.3060
Total	0.0102	0.1970	0.3335	6.3000e-004		8.1000e-004	8.1000e-004		8.1000e-004	8.1000e-004	0.0000	53.0071	53.0071	0.0142	0.0000	53.3060

3.24 Year -2 Month 11 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.25 Year -2 Month 12 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0546	0.3931	0.3006	4.8000e-004		0.0239	0.0239		0.0224	0.0224	0.0000	41.3041	41.3041	0.0117	0.0000	41.5503
Total	0.0546	0.3931	0.3006	4.8000e-004		0.0239	0.0239		0.0224	0.0224	0.0000	41.3041	41.3041	0.0117	0.0000	41.5503

3.25 Year -2 Month 12 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.9300e-003	0.1447	0.2604	4.8000e-004		6.6000e-004	6.6000e-004		6.6000e-004	6.6000e-004	0.0000	41.3041	41.3041	0.0117	0.0000	41.5502
Total	7.9300e-003	0.1447	0.2604	4.8000e-004		6.6000e-004	6.6000e-004		6.6000e-004	6.6000e-004	0.0000	41.3041	41.3041	0.0117	0.0000	41.5502

3.25 Year -2 Month 12 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.26 Year -1 Month 1 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1405	1.3310	0.9468	1.6600e-003		0.0685	0.0685		0.0634	0.0634	0.0000	146.3726	146.3726	0.0447	0.0000	147.3113
Total	0.1405	1.3310	0.9468	1.6600e-003		0.0685	0.0685		0.0634	0.0634	0.0000	146.3726	146.3726	0.0447	0.0000	147.3113

3.26 Year -1 Month 1 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0244	0.2923	1.0094	1.6600e-003		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003	0.0000	146.3724	146.3724	0.0447	0.0000	147.3111
Total	0.0244	0.2923	1.0094	1.6600e-003		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003	0.0000	146.3724	146.3724	0.0447	0.0000	147.3111

3.26 Year -1 Month 1 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.27 Year -1 Month 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2798	2.7842	1.7932	3.1400e-003		0.1415	0.1415		0.1309	0.1309	0.0000	277.7266	277.7266	0.0850	0.0000	279.5117
Total	0.2798	2.7842	1.7932	3.1400e-003		0.1415	0.1415		0.1309	0.1309	0.0000	277.7266	277.7266	0.0850	0.0000	279.5117

3.27 Year -1 Month 2 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0444	0.4669	1.9095	3.1400e-003		4.9300e-003	4.9300e-003		4.9300e-003	4.9300e-003	0.0000	277.7263	277.7263	0.0850	0.0000	279.5114
Total	0.0444	0.4669	1.9095	3.1400e-003		4.9300e-003	4.9300e-003		4.9300e-003	4.9300e-003	0.0000	277.7263	277.7263	0.0850	0.0000	279.5114

3.27 Year -1 Month 2 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.28 Year -1 Month 3 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6575	5.6950	3.7606	7.1300e-003		0.2780	0.2780		0.2606	0.2606	0.0000	615.2129	615.2129	0.1772	0.0000	618.9331
Total	0.6575	5.6950	3.7606	7.1300e-003		0.2780	0.2780		0.2606	0.2606	0.0000	615.2129	615.2129	0.1772	0.0000	618.9331

3.28 Year -1 Month 3 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0998	1.1531	3.9644	7.1300e-003		0.0107	0.0107		0.0107	0.0107	0.0000	615.2121	615.2121	0.1772	0.0000	618.9323
Total	0.0998	1.1531	3.9644	7.1300e-003		0.0107	0.0107		0.0107	0.0107	0.0000	615.2121	615.2121	0.1772	0.0000	618.9323

3.28 Year -1 Month 3 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.29 Year -1 Month 4 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6013	5.5518	3.5396	6.8400e-003		0.2675	0.2675		0.2495	0.2495	0.0000	596.3098	596.3098	0.1761	0.0000	600.0083
Total	0.6013	5.5518	3.5396	6.8400e-003		0.2675	0.2675		0.2495	0.2495	0.0000	596.3098	596.3098	0.1761	0.0000	600.0083

3.29 Year -1 Month 4 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0934	0.9715	3.7947	6.8400e-003		0.0104	0.0104		0.0104	0.0104	0.0000	596.3091	596.3091	0.1761	0.0000	600.0076
Total	0.0934	0.9715	3.7947	6.8400e-003		0.0104	0.0104		0.0104	0.0104	0.0000	596.3091	596.3091	0.1761	0.0000	600.0076

3.29 Year -1 Month 4 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.30 Year -1 Month 5 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6509	5.9327	3.8080	7.3900e-003		0.2852	0.2852		0.2663	0.2663	0.0000	642.7247	642.7247	0.1888	0.0000	646.6903
Total	0.6509	5.9327	3.8080	7.3900e-003		0.2852	0.2852		0.2663	0.2663	0.0000	642.7247	642.7247	0.1888	0.0000	646.6903

3.30 Year -1 Month 5 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1007	1.0516	4.0763	7.3900e-003		0.0112	0.0112		0.0112	0.0112	0.0000	642.7239	642.7239	0.1888	0.0000	646.6895
Total	0.1007	1.0516	4.0763	7.3900e-003		0.0112	0.0112		0.0112	0.0112	0.0000	642.7239	642.7239	0.1888	0.0000	646.6895

3.30 Year -1 Month 5 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.31 Year -1 Month 6 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6229	5.7005	3.6255	7.1300e-003		0.2731	0.2731		0.2549	0.2549	0.0000	620.6199	620.6199	0.1825	0.0000	624.4521
Total	0.6229	5.7005	3.6255	7.1300e-003		0.2731	0.2731		0.2549	0.2549	0.0000	620.6199	620.6199	0.1825	0.0000	624.4521

3.31 Year -1 Month 6 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0966	0.9952	3.8891	7.1300e-003		0.0108	0.0108		0.0108	0.0108	0.0000	620.6192	620.6192	0.1825	0.0000	624.4514
Total	0.0966	0.9952	3.8891	7.1300e-003		0.0108	0.0108		0.0108	0.0108	0.0000	620.6192	620.6192	0.1825	0.0000	624.4514

3.31 Year -1 Month 6 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.32 Year -1 Month 7 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.6727	6.1565	3.9156	7.7000e-003		0.2949	0.2949		0.2753	0.2753	0.0000	670.2695	670.2695	0.1971	0.0000	674.4083
Total	0.6727	6.1565	3.9156	7.7000e-003		0.2949	0.2949		0.2753	0.2753	0.0000	670.2695	670.2695	0.1971	0.0000	674.4083

3.32 Year -1 Month 7 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1044	1.0749	4.2002	7.7000e-003		0.0117	0.0117		0.0117	0.0117	0.0000	670.2687	670.2687	0.1971	0.0000	674.4075
Total	0.1044	1.0749	4.2002	7.7000e-003		0.0117	0.0117		0.0117	0.0117	0.0000	670.2687	670.2687	0.1971	0.0000	674.4075

3.32 Year -1 Month 7 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.33 Year -1 Month 8 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.5874	5.3361	3.3735	6.5500e-003		0.2583	0.2583		0.2410	0.2410	0.0000	570.1117	570.1117	0.1677	0.0000	573.6335
Total	0.5874	5.3361	3.3735	6.5500e-003		0.2583	0.2583		0.2410	0.2410	0.0000	570.1117	570.1117	0.1677	0.0000	573.6335

3.33 Year -1 Month 8 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0904	0.9618	3.6185	6.5500e-003		0.0100	0.0100		0.0100	0.0100	0.0000	570.1110	570.1110	0.1677	0.0000	573.6328
Total	0.0904	0.9618	3.6185	6.5500e-003		0.0100	0.0100		0.0100	0.0100	0.0000	570.1110	570.1110	0.1677	0.0000	573.6328

3.33 Year -1 Month 8 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.34 Year -1 Month 9 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.5269	4.8053	3.0542	5.9500e-003		0.2310	0.2310		0.2156	0.2156	0.0000	517.7552	517.7552	0.1525	0.0000	520.9572
Total	0.5269	4.8053	3.0542	5.9500e-003		0.2310	0.2310		0.2156	0.2156	0.0000	517.7552	517.7552	0.1525	0.0000	520.9572

3.34 Year -1 Month 9 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0813	0.8373	3.2935	5.9500e-003		9.0900e-003	9.0900e-003		9.0900e-003	9.0900e-003	0.0000	517.7545	517.7545	0.1525	0.0000	520.9566
Total	0.0813	0.8373	3.2935	5.9500e-003		9.0900e-003	9.0900e-003		9.0900e-003	9.0900e-003	0.0000	517.7545	517.7545	0.1525	0.0000	520.9566

3.34 Year -1 Month 9 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.35 Year -1 Month 10 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3629	3.3640	2.0471	4.0800e-003		0.1593	0.1593		0.1487	0.1487	0.0000	355.3066	355.3066	0.1047	0.0000	357.5042
Total	0.3629	3.3640	2.0471	4.0800e-003		0.1593	0.1593		0.1487	0.1487	0.0000	355.3066	355.3066	0.1047	0.0000	357.5042

3.35 Year -1 Month 10 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0548	0.5378	2.2333	4.0800e-003		6.2200e-003	6.2200e-003		6.2200e-003	6.2200e-003	0.0000	355.3061	355.3061	0.1047	0.0000	357.5037
Total	0.0548	0.5378	2.2333	4.0800e-003		6.2200e-003	6.2200e-003		6.2200e-003	6.2200e-003	0.0000	355.3061	355.3061	0.1047	0.0000	357.5037

3.35 Year -1 Month 10 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.36 Year -1 Month 11 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2278	1.8523	1.3418	2.2500e-003		0.0974	0.0974		0.0913	0.0913	0.0000	192.4341	192.4341	0.0544	0.0000	193.5756
Total	0.2278	1.8523	1.3418	2.2500e-003		0.0974	0.0974		0.0913	0.0913	0.0000	192.4341	192.4341	0.0544	0.0000	193.5756

3.36 Year -1 Month 11 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0314	0.3885	1.3275	2.2500e-003		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	192.4339	192.4339	0.0544	0.0000	193.5754
Total	0.0314	0.3885	1.3275	2.2500e-003		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	192.4339	192.4339	0.0544	0.0000	193.5754

3.36 Year -1 Month 11 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.37 Year -1 Month 12 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0862	0.6819	0.5193	9.2000e-004		0.0362	0.0362		0.0340	0.0340	0.0000	79.0364	79.0364	0.0221	0.0000	79.4999
Total	0.0862	0.6819	0.5193	9.2000e-004		0.0362	0.0362		0.0340	0.0340	0.0000	79.0364	79.0364	0.0221	0.0000	79.4999

3.37 Year -1 Month 12 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0129	0.1896	0.4850	9.2000e-004		1.2400e-003	1.2400e-003		1.2400e-003	1.2400e-003	0.0000	79.0363	79.0363	0.0221	0.0000	79.4998
Total	0.0129	0.1896	0.4850	9.2000e-004		1.2400e-003	1.2400e-003		1.2400e-003	1.2400e-003	0.0000	79.0363	79.0363	0.0221	0.0000	79.4998

3.37 Year -1 Month 12 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.38 Year 1 Month 1 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0259	0.2892	0.1831	3.4000e-004		0.0136	0.0136		0.0125	0.0125	0.0000	30.1759	30.1759	9.7600e-003	0.0000	30.3809
Total	0.0259	0.2892	0.1831	3.4000e-004		0.0136	0.0136		0.0125	0.0125	0.0000	30.1759	30.1759	9.7600e-003	0.0000	30.3809

3.38 Year 1 Month 1 - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.6700e-003	0.0366	0.2162	3.4000e-004		5.6000e-004	5.6000e-004		5.6000e-004	5.6000e-004	0.0000	30.1759	30.1759	9.7600e-003	0.0000	30.3808
Total	4.6700e-003	0.0366	0.2162	3.4000e-004		5.6000e-004	5.6000e-004		5.6000e-004	5.6000e-004	0.0000	30.1759	30.1759	9.7600e-003	0.0000	30.3808

3.38 Year 1 Month 1 - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.39 Year 1 Month 2 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0683	0.6778	0.4219	8.0000e-004		0.0317	0.0317		0.0294	0.0294	0.0000	69.1917	69.1917	0.0210	0.0000	69.6331
Total	0.0683	0.6778	0.4219	8.0000e-004		0.0317	0.0317		0.0294	0.0294	0.0000	69.1917	69.1917	0.0210	0.0000	69.6331

3.39 Year 1 Month 2 - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0108	0.0948	0.4750	8.0000e-004		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003	0.0000	69.1916	69.1916	0.0210	0.0000	69.6330
Total	0.0108	0.0948	0.4750	8.0000e-004		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003	0.0000	69.1916	69.1916	0.0210	0.0000	69.6330

3.39 Year 1 Month 2 - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.40 Year 1 Month 3 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0490	0.4558	0.2808	5.4000e-004		0.0213	0.0213		0.0199	0.0199	0.0000	45.8994	45.8994	0.0134	0.0000	46.1802
Total	0.0490	0.4558	0.2808	5.4000e-004		0.0213	0.0213		0.0199	0.0199	0.0000	45.8994	45.8994	0.0134	0.0000	46.1802

3.40 Year 1 Month 3 - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.2100e-003	0.0675	0.3064	5.4000e-004		8.3000e-004	8.3000e-004		8.3000e-004	8.3000e-004	0.0000	45.8993	45.8993	0.0134	0.0000	46.1801
Total	7.2100e-003	0.0675	0.3064	5.4000e-004		8.3000e-004	8.3000e-004		8.3000e-004	8.3000e-004	0.0000	45.8993	45.8993	0.0134	0.0000	46.1801

3.40 Year 1 Month 3 - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.41 Year 1 Month 4 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0562	0.5415	0.3144	6.3000e-004		0.0248	0.0248		0.0231	0.0231	0.0000	53.9586	53.9586	0.0160	0.0000	54.2942
Total	0.0562	0.5415	0.3144	6.3000e-004		0.0248	0.0248		0.0231	0.0231	0.0000	53.9586	53.9586	0.0160	0.0000	54.2942

3.41 Year 1 Month 4 - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.3400e-003	0.0724	0.3477	6.3000e-004		9.8000e-004	9.8000e-004		9.8000e-004	9.8000e-004	0.0000	53.9585	53.9585	0.0160	0.0000	54.2941
Total	8.3400e-003	0.0724	0.3477	6.3000e-004		9.8000e-004	9.8000e-004		9.8000e-004	9.8000e-004	0.0000	53.9585	53.9585	0.0160	0.0000	54.2941

3.41 Year 1 Month 4 - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.42 Year 1 Month 5 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0562	0.5415	0.3144	6.3000e-004		0.0248	0.0248		0.0231	0.0231	0.0000	53.9586	53.9586	0.0160	0.0000	54.2942
Total	0.0562	0.5415	0.3144	6.3000e-004		0.0248	0.0248		0.0231	0.0231	0.0000	53.9586	53.9586	0.0160	0.0000	54.2942

3.42 Year 1 Month 5 - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.3400e-003	0.0724	0.3477	6.3000e-004		9.8000e-004	9.8000e-004		9.8000e-004	9.8000e-004	0.0000	53.9585	53.9585	0.0160	0.0000	54.2941
Total	8.3400e-003	0.0724	0.3477	6.3000e-004		9.8000e-004	9.8000e-004		9.8000e-004	9.8000e-004	0.0000	53.9585	53.9585	0.0160	0.0000	54.2941

3.42 Year 1 Month 5 - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.43 Year 1 Month 6 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0439	0.4325	0.2546	5.0000e-004		0.0200	0.0200		0.0186	0.0186	0.0000	43.1067	43.1067	0.0130	0.0000	43.3789
Total	0.0439	0.4325	0.2546	5.0000e-004		0.0200	0.0200		0.0186	0.0186	0.0000	43.1067	43.1067	0.0130	0.0000	43.3789

3.43 Year 1 Month 6 - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.5600e-003	0.0526	0.2842	5.0000e-004		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	43.1067	43.1067	0.0130	0.0000	43.3789
Total	6.5600e-003	0.0526	0.2842	5.0000e-004		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	43.1067	43.1067	0.0130	0.0000	43.3789

3.43 Year 1 Month 6 - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.44 Year 1 Month 7 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1331	1.4963	0.7437	1.9200e-003		0.0616	0.0616		0.0569	0.0569	0.0000	167.4475	167.4475	0.0531	0.0000	168.5634
Total	0.1331	1.4963	0.7437	1.9200e-003		0.0616	0.0616		0.0569	0.0569	0.0000	167.4475	167.4475	0.0531	0.0000	168.5634

3.44 Year 1 Month 7 - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0240	0.1289	0.9729	1.9200e-003		3.1100e-003	3.1100e-003		3.1100e-003	3.1100e-003	0.0000	167.4473	167.4473	0.0531	0.0000	168.5632
Total	0.0240	0.1289	0.9729	1.9200e-003		3.1100e-003	3.1100e-003		3.1100e-003	3.1100e-003	0.0000	167.4473	167.4473	0.0531	0.0000	168.5632

3.44 Year 1 Month 7 - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.45 Year 1 Month 8 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1282	1.4409	0.7162	1.8500e-003		0.0593	0.0593		0.0548	0.0548	0.0000	161.2457	161.2457	0.0512	0.0000	162.3203
Total	0.1282	1.4409	0.7162	1.8500e-003		0.0593	0.0593		0.0548	0.0548	0.0000	161.2457	161.2457	0.0512	0.0000	162.3203

3.45 Year 1 Month 8 - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0231	0.1242	0.9368	1.8500e-003		2.9900e-003	2.9900e-003		2.9900e-003	2.9900e-003	0.0000	161.2455	161.2455	0.0512	0.0000	162.3201
Total	0.0231	0.1242	0.9368	1.8500e-003		2.9900e-003	2.9900e-003		2.9900e-003	2.9900e-003	0.0000	161.2455	161.2455	0.0512	0.0000	162.3201

3.45 Year 1 Month 8 - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.46 Year 1 Month 9 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0915	1.0941	0.4952	1.4400e-003		0.0429	0.0429		0.0395	0.0395	0.0000	126.1982	126.1982	0.0408	0.0000	127.0554
Total	0.0915	1.0941	0.4952	1.4400e-003		0.0429	0.0429		0.0395	0.0395	0.0000	126.1982	126.1982	0.0408	0.0000	127.0554

3.46 Year 1 Month 9 - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0177	0.0765	0.6940	1.4400e-003		2.3500e-003	2.3500e-003		2.3500e-003	2.3500e-003	0.0000	126.1981	126.1981	0.0408	0.0000	127.0552
Total	0.0177	0.0765	0.6940	1.4400e-003		2.3500e-003	2.3500e-003		2.3500e-003	2.3500e-003	0.0000	126.1981	126.1981	0.0408	0.0000	127.0552

3.46 Year 1 Month 9 - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.47 Year 1 Month 10 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0950	1.1362	0.5143	1.4900e-003		0.0445	0.0445		0.0410	0.0410	0.0000	131.0520	131.0520	0.0424	0.0000	131.9421
Total	0.0950	1.1362	0.5143	1.4900e-003		0.0445	0.0445		0.0410	0.0410	0.0000	131.0520	131.0520	0.0424	0.0000	131.9421

3.47 Year 1 Month 10 - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0183	0.0794	0.7207	1.4900e-003		2.4400e-003	2.4400e-003		2.4400e-003	2.4400e-003	0.0000	131.0519	131.0519	0.0424	0.0000	131.9419
Total	0.0183	0.0794	0.7207	1.4900e-003		2.4400e-003	2.4400e-003		2.4400e-003	2.4400e-003	0.0000	131.0519	131.0519	0.0424	0.0000	131.9419

3.49 Year 1 Month 12 - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.50 Year 2 Month 1 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0228	0.2505	0.1738	3.3000e-004		0.0116	0.0116		0.0106	0.0106	0.0000	29.0541	29.0541	9.4000e-003	0.0000	29.2514
Total	0.0228	0.2505	0.1738	3.3000e-004		0.0116	0.0116		0.0106	0.0106	0.0000	29.0541	29.0541	9.4000e-003	0.0000	29.2514

3.50 Year 2 Month 1 - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.5000e-003	0.0353	0.2082	3.3000e-004		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	29.0541	29.0541	9.4000e-003	0.0000	29.2514
Total	4.5000e-003	0.0353	0.2082	3.3000e-004		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	29.0541	29.0541	9.4000e-003	0.0000	29.2514

3.50 Year 2 Month 1 - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.51 Year 2 Month 2 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0612	0.6061	0.4103	8.0000e-004		0.0276	0.0276		0.0256	0.0256	0.0000	69.1800	69.1800	0.0209	0.0000	69.6185
Total	0.0612	0.6061	0.4103	8.0000e-004		0.0276	0.0276		0.0256	0.0256	0.0000	69.1800	69.1800	0.0209	0.0000	69.6185

3.51 Year 2 Month 2 - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0108	0.0948	0.4750	8.0000e-004		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003	0.0000	69.1799	69.1799	0.0209	0.0000	69.6184
Total	0.0108	0.0948	0.4750	8.0000e-004		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003	0.0000	69.1799	69.1799	0.0209	0.0000	69.6184

3.51 Year 2 Month 2 - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.52 Year 2 Month 3 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0688	0.6818	0.4616	9.0000e-004		0.0310	0.0310		0.0288	0.0288	0.0000	77.8275	77.8275	0.0235	0.0000	78.3208
Total	0.0688	0.6818	0.4616	9.0000e-004		0.0310	0.0310		0.0288	0.0288	0.0000	77.8275	77.8275	0.0235	0.0000	78.3208

3.52 Year 2 Month 3 - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0122	0.1067	0.5344	9.0000e-004		1.4300e-003	1.4300e-003		1.4300e-003	1.4300e-003	0.0000	77.8274	77.8274	0.0235	0.0000	78.3207
Total	0.0122	0.1067	0.5344	9.0000e-004		1.4300e-003	1.4300e-003		1.4300e-003	1.4300e-003	0.0000	77.8274	77.8274	0.0235	0.0000	78.3207

3.52 Year 2 Month 3 - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.53 Year 2 Month 4 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0728	0.7337	0.4761	9.6000e-004		0.0330	0.0330		0.0306	0.0306	0.0000	83.0035	83.0035	0.0252	0.0000	83.5333
Total	0.0728	0.7337	0.4761	9.6000e-004		0.0330	0.0330		0.0306	0.0306	0.0000	83.0035	83.0035	0.0252	0.0000	83.5333

3.53 Year 2 Month 4 - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0128	0.1076	0.5559	9.6000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	83.0034	83.0034	0.0252	0.0000	83.5332
Total	0.0128	0.1076	0.5559	9.6000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	83.0034	83.0034	0.0252	0.0000	83.5332

3.53 Year 2 Month 4 - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.54 Year 2 Month 5 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0390	0.3837	0.2452	5.0000e-004		0.0172	0.0172		0.0160	0.0160	0.0000	43.0983	43.0983	0.0129	0.0000	43.3684
Total	0.0390	0.3837	0.2452	5.0000e-004		0.0172	0.0172		0.0160	0.0160	0.0000	43.0983	43.0983	0.0129	0.0000	43.3684

3.54 Year 2 Month 5 - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.5600e-003	0.0526	0.2842	5.0000e-004		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	43.0982	43.0982	0.0129	0.0000	43.3683
Total	6.5600e-003	0.0526	0.2842	5.0000e-004		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	43.0982	43.0982	0.0129	0.0000	43.3683

3.54 Year 2 Month 5 - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.55 Year 2 Month 6 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0390	0.3837	0.2452	5.0000e-004		0.0172	0.0172		0.0160	0.0160	0.0000	43.0983	43.0983	0.0129	0.0000	43.3684
Total	0.0390	0.3837	0.2452	5.0000e-004		0.0172	0.0172		0.0160	0.0160	0.0000	43.0983	43.0983	0.0129	0.0000	43.3684

3.55 Year 2 Month 6 - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.5600e-003	0.0526	0.2842	5.0000e-004		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	43.0982	43.0982	0.0129	0.0000	43.3683
Total	6.5600e-003	0.0526	0.2842	5.0000e-004		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	43.0982	43.0982	0.0129	0.0000	43.3683

3.55 Year 2 Month 6 - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.56 Year 2 Month 7 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0337	0.3184	0.2219	4.3000e-004		0.0146	0.0146		0.0136	0.0136	0.0000	36.3875	36.3875	0.0107	0.0000	36.6111
Total	0.0337	0.3184	0.2219	4.3000e-004		0.0146	0.0146		0.0136	0.0136	0.0000	36.3875	36.3875	0.0107	0.0000	36.6111

3.56 Year 2 Month 7 - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.6400e-003	0.0495	0.2522	4.3000e-004		6.6000e-004	6.6000e-004		6.6000e-004	6.6000e-004	0.0000	36.3874	36.3874	0.0107	0.0000	36.6110
Total	5.6400e-003	0.0495	0.2522	4.3000e-004		6.6000e-004	6.6000e-004		6.6000e-004	6.6000e-004	0.0000	36.3874	36.3874	0.0107	0.0000	36.6110

3.56 Year 2 Month 7 - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.57 Year 2 Month 8 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1283	1.4347	0.7394	1.9900e-003		0.0580	0.0580		0.0535	0.0535	0.0000	173.4793	173.4793	0.0550	0.0000	174.6349
Total	0.1283	1.4347	0.7394	1.9900e-003		0.0580	0.0580		0.0535	0.0535	0.0000	173.4793	173.4793	0.0550	0.0000	174.6349

3.57 Year 2 Month 8 - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0248	0.1316	0.9997	1.9900e-003		3.2200e-003	3.2200e-003		3.2200e-003	3.2200e-003	0.0000	173.4791	173.4791	0.0550	0.0000	174.6347
Total	0.0248	0.1316	0.9997	1.9900e-003		3.2200e-003	3.2200e-003		3.2200e-003	3.2200e-003	0.0000	173.4791	173.4791	0.0550	0.0000	174.6347

3.57 Year 2 Month 8 - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.58 Year 2 Month 9 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0958	1.1281	0.5258	1.5800e-003		0.0439	0.0439		0.0404	0.0404	0.0000	138.4395	138.4395	0.0448	0.0000	139.3797
Total	0.0958	1.1281	0.5258	1.5800e-003		0.0439	0.0439		0.0404	0.0404	0.0000	138.4395	138.4395	0.0448	0.0000	139.3797

3.58 Year 2 Month 9 - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0194	0.0839	0.7569	1.5800e-003		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003	0.0000	138.4393	138.4393	0.0448	0.0000	139.3796
Total	0.0194	0.0839	0.7569	1.5800e-003		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003	0.0000	138.4393	138.4393	0.0448	0.0000	139.3796

3.58 Year 2 Month 9 - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.59 Year 2 Month 10 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0958	1.1281	0.5258	1.5800e-003		0.0439	0.0439		0.0404	0.0404	0.0000	138.4395	138.4395	0.0448	0.0000	139.3797
Total	0.0958	1.1281	0.5258	1.5800e-003		0.0439	0.0439		0.0404	0.0404	0.0000	138.4395	138.4395	0.0448	0.0000	139.3797

3.59 Year 2 Month 10 - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0194	0.0839	0.7569	1.5800e-003		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003	0.0000	138.4393	138.4393	0.0448	0.0000	139.3796
Total	0.0194	0.0839	0.7569	1.5800e-003		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003	0.0000	138.4393	138.4393	0.0448	0.0000	139.3796

3.64 Year 3 Month 3 - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.65 Year 3 Month 4 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9300e-003	0.0665	0.0301	9.0000e-005		2.7600e-003	2.7600e-003		2.5400e-003	2.5400e-003	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146
Total	5.9300e-003	0.0665	0.0301	9.0000e-005		2.7600e-003	2.7600e-003		2.5400e-003	2.5400e-003	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146

3.65 Year 3 Month 4 - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1300e-003	4.8800e-003	0.0413	9.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146
Total	1.1300e-003	4.8800e-003	0.0413	9.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146

3.65 Year 3 Month 4 - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.66 Year 3 Month 5 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9300e-003	0.0665	0.0301	9.0000e-005		2.7600e-003	2.7600e-003		2.5400e-003	2.5400e-003	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146
Total	5.9300e-003	0.0665	0.0301	9.0000e-005		2.7600e-003	2.7600e-003		2.5400e-003	2.5400e-003	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146

3.66 Year 3 Month 5 - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1300e-003	4.8800e-003	0.0413	9.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146
Total	1.1300e-003	4.8800e-003	0.0413	9.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146

3.66 Year 3 Month 5 - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.67 Year 3 Month 6 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9300e-003	0.0665	0.0301	9.0000e-005		2.7600e-003	2.7600e-003		2.5400e-003	2.5400e-003	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146
Total	5.9300e-003	0.0665	0.0301	9.0000e-005		2.7600e-003	2.7600e-003		2.5400e-003	2.5400e-003	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146

3.67 Year 3 Month 6 - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1300e-003	4.8800e-003	0.0413	9.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146
Total	1.1300e-003	4.8800e-003	0.0413	9.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	8.0598	8.0598	2.6100e-003	0.0000	8.1146

3.68 Year 3 Month 7 - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.69 Year 3 Month 8 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0882	0.9883	0.5176	1.6400e-003		0.0387	0.0387		0.0356	0.0356	0.0000	143.6729	143.6729	0.0465	0.0000	144.6487
Total	0.0882	0.9883	0.5176	1.6400e-003		0.0387	0.0387		0.0356	0.0356	0.0000	143.6729	143.6729	0.0465	0.0000	144.6487

3.69 Year 3 Month 8 - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0201	0.0871	0.7860	1.6400e-003		2.6800e-003	2.6800e-003		2.6800e-003	2.6800e-003	0.0000	143.6728	143.6728	0.0465	0.0000	144.6486
Total	0.0201	0.0871	0.7860	1.6400e-003		2.6800e-003	2.6800e-003		2.6800e-003	2.6800e-003	0.0000	143.6728	143.6728	0.0465	0.0000	144.6486

3.69 Year 3 Month 8 - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.70 Year 3 Month 9 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0850	0.9517	0.4984	1.5800e-003		0.0373	0.0373		0.0343	0.0343	0.0000	138.3517	138.3517	0.0448	0.0000	139.2914
Total	0.0850	0.9517	0.4984	1.5800e-003		0.0373	0.0373		0.0343	0.0343	0.0000	138.3517	138.3517	0.0448	0.0000	139.2914

3.70 Year 3 Month 9 - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0194	0.0839	0.7569	1.5800e-003		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003	0.0000	138.3516	138.3516	0.0448	0.0000	139.2912
Total	0.0194	0.0839	0.7569	1.5800e-003		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003	0.0000	138.3516	138.3516	0.0448	0.0000	139.2912

3.70 Year 3 Month 9 - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.71 Year 3 Month 10 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0850	0.9517	0.4984	1.5800e-003		0.0373	0.0373		0.0343	0.0343	0.0000	138.3517	138.3517	0.0448	0.0000	139.2914
Total	0.0850	0.9517	0.4984	1.5800e-003		0.0373	0.0373		0.0343	0.0343	0.0000	138.3517	138.3517	0.0448	0.0000	139.2914

3.71 Year 3 Month 10 - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0194	0.0839	0.7569	1.5800e-003		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003	0.0000	138.3516	138.3516	0.0448	0.0000	139.2912
Total	0.0194	0.0839	0.7569	1.5800e-003		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003	0.0000	138.3516	138.3516	0.0448	0.0000	139.2912

3.73 Year 3 Month 12 - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.74 Year 4 Month 1 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0297	0.2772	0.2959	5.8000e-004		0.0126	0.0126		0.0117	0.0117	0.0000	50.3188	50.3188	0.0159	0.0000	50.6518
Total	0.0297	0.2772	0.2959	5.8000e-004		0.0126	0.0126		0.0117	0.0117	0.0000	50.3188	50.3188	0.0159	0.0000	50.6518

3.74 Year 4 Month 1 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.0300e-003	0.0407	0.3585	5.8000e-004		9.0000e-004	9.0000e-004		9.0000e-004	9.0000e-004	0.0000	50.3188	50.3188	0.0159	0.0000	50.6518
Total	7.0300e-003	0.0407	0.3585	5.8000e-004		9.0000e-004	9.0000e-004		9.0000e-004	9.0000e-004	0.0000	50.3188	50.3188	0.0159	0.0000	50.6518

3.74 Year 4 Month 1 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.75 Year 4 Month 2 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0361	0.3201	0.3497	6.5000e-004		0.0147	0.0147		0.0136	0.0136	0.0000	55.8747	55.8747	0.0170	0.0000	56.2319
Total	0.0361	0.3201	0.3497	6.5000e-004		0.0147	0.0147		0.0136	0.0136	0.0000	55.8747	55.8747	0.0170	0.0000	56.2319

3.75 Year 4 Month 2 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.1100e-003	0.0587	0.4079	6.5000e-004		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	55.8746	55.8746	0.0170	0.0000	56.2318
Total	8.1100e-003	0.0587	0.4079	6.5000e-004		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	55.8746	55.8746	0.0170	0.0000	56.2318

3.75 Year 4 Month 2 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.76 Year 4 Month 3 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0259	0.2214	0.2488	3.9000e-004		0.0110	0.0110		0.0102	0.0102	0.0000	33.4153	33.4153	9.6200e-003	0.0000	33.6172
Total	0.0259	0.2214	0.2488	3.9000e-004		0.0110	0.0110		0.0102	0.0102	0.0000	33.4153	33.4153	9.6200e-003	0.0000	33.6172

3.76 Year 4 Month 3 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.7600e-003	0.0365	0.2669	3.9000e-004		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	33.4153	33.4153	9.6200e-003	0.0000	33.6172
Total	4.7600e-003	0.0365	0.2669	3.9000e-004		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	33.4153	33.4153	9.6200e-003	0.0000	33.6172

3.76 Year 4 Month 3 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.77 Year 4 Month 4 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0956	0.7641	0.7339	1.4400e-003		0.0352	0.0352		0.0330	0.0330	0.0000	121.7204	121.7204	0.0346	0.0000	122.4460
Total	0.0956	0.7641	0.7339	1.4400e-003		0.0352	0.0352		0.0330	0.0330	0.0000	121.7204	121.7204	0.0346	0.0000	122.4460

3.77 Year 4 Month 4 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0195	0.2351	0.7791	1.4400e-003		2.0600e-003	2.0600e-003		2.0600e-003	2.0600e-003	0.0000	121.7202	121.7202	0.0346	0.0000	122.4459
Total	0.0195	0.2351	0.7791	1.4400e-003		2.0600e-003	2.0600e-003		2.0600e-003	2.0600e-003	0.0000	121.7202	121.7202	0.0346	0.0000	122.4459

3.77 Year 4 Month 4 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.78 Year 4 Month 5 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1121	0.8581	0.8445	1.6600e-003		0.0386	0.0386		0.0363	0.0363	0.0000	138.9279	138.9279	0.0378	0.0000	139.7224
Total	0.1121	0.8581	0.8445	1.6600e-003		0.0386	0.0386		0.0363	0.0363	0.0000	138.9279	138.9279	0.0378	0.0000	139.7224

3.78 Year 4 Month 5 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0224	0.2884	0.8790	1.6600e-003		2.3000e-003	2.3000e-003		2.3000e-003	2.3000e-003	0.0000	138.9278	138.9278	0.0378	0.0000	139.7222
Total	0.0224	0.2884	0.8790	1.6600e-003		2.3000e-003	2.3000e-003		2.3000e-003	2.3000e-003	0.0000	138.9278	138.9278	0.0378	0.0000	139.7222

3.78 Year 4 Month 5 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.79 Year 4 Month 6 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1174	0.9180	0.8848	1.8000e-003		0.0414	0.0414		0.0388	0.0388	0.0000	151.8389	151.8389	0.0423	0.0000	152.7265
Total	0.1174	0.9180	0.8848	1.8000e-003		0.0414	0.0414		0.0388	0.0388	0.0000	151.8389	151.8389	0.0423	0.0000	152.7265

3.79 Year 4 Month 6 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0244	0.3014	0.9463	1.8000e-003		2.5500e-003	2.5500e-003		2.5500e-003	2.5500e-003	0.0000	151.8387	151.8387	0.0423	0.0000	152.7264
Total	0.0244	0.3014	0.9463	1.8000e-003		2.5500e-003	2.5500e-003		2.5500e-003	2.5500e-003	0.0000	151.8387	151.8387	0.0423	0.0000	152.7264

3.79 Year 4 Month 6 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.80 Year 4 Month 7 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1105	0.8568	0.8338	1.6400e-003		0.0396	0.0396		0.0372	0.0372	0.0000	138.4999	138.4999	0.0384	0.0000	139.3067
Total	0.1105	0.8568	0.8338	1.6400e-003		0.0396	0.0396		0.0372	0.0372	0.0000	138.4999	138.4999	0.0384	0.0000	139.3067

3.80 Year 4 Month 7 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0232	0.3074	0.8807	1.6400e-003		2.3400e-003	2.3400e-003		2.3400e-003	2.3400e-003	0.0000	138.4997	138.4997	0.0384	0.0000	139.3066
Total	0.0232	0.3074	0.8807	1.6400e-003		2.3400e-003	2.3400e-003		2.3400e-003	2.3400e-003	0.0000	138.4997	138.4997	0.0384	0.0000	139.3066

3.80 Year 4 Month 7 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.81 Year 4 Month 8 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1858	1.6865	1.3254	3.1600e-003		0.0735	0.0735		0.0683	0.0683	0.0000	272.1212	272.1212	0.0826	0.0000	273.8554
Total	0.1858	1.6865	1.3254	3.1600e-003		0.0735	0.0735		0.0683	0.0683	0.0000	272.1212	272.1212	0.0826	0.0000	273.8554

3.81 Year 4 Month 8 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0420	0.3811	1.6504	3.1600e-003		4.8800e-003	4.8800e-003		4.8800e-003	4.8800e-003	0.0000	272.1209	272.1209	0.0826	0.0000	273.8551
Total	0.0420	0.3811	1.6504	3.1600e-003		4.8800e-003	4.8800e-003		4.8800e-003	4.8800e-003	0.0000	272.1209	272.1209	0.0826	0.0000	273.8551

3.81 Year 4 Month 8 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.82 Year 4 Month 9 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1733	1.5738	1.2357	2.9900e-003		0.0675	0.0675		0.0627	0.0627	0.0000	257.6494	257.6494	0.0781	0.0000	259.2895
Total	0.1733	1.5738	1.2357	2.9900e-003		0.0675	0.0675		0.0627	0.0627	0.0000	257.6494	257.6494	0.0781	0.0000	259.2895

3.82 Year 4 Month 9 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0392	0.3388	1.5511	2.9900e-003		4.6200e-003	4.6200e-003		4.6200e-003	4.6200e-003	0.0000	257.6491	257.6491	0.0781	0.0000	259.2892
Total	0.0392	0.3388	1.5511	2.9900e-003		4.6200e-003	4.6200e-003		4.6200e-003	4.6200e-003	0.0000	257.6491	257.6491	0.0781	0.0000	259.2892

3.82 Year 4 Month 9 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.83 Year 4 Month 10 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1363	1.2768	0.9543	2.3700e-003		0.0540	0.0540		0.0502	0.0502	0.0000	204.8925	204.8925	0.0626	0.0000	206.2072
Total	0.1363	1.2768	0.9543	2.3700e-003		0.0540	0.0540		0.0502	0.0502	0.0000	204.8925	204.8925	0.0626	0.0000	206.2072

3.83 Year 4 Month 10 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0311	0.2625	1.2227	2.3700e-003		3.6800e-003	3.6800e-003		3.6800e-003	3.6800e-003	0.0000	204.8923	204.8923	0.0626	0.0000	206.2070
Total	0.0311	0.2625	1.2227	2.3700e-003		3.6800e-003	3.6800e-003		3.6800e-003	3.6800e-003	0.0000	204.8923	204.8923	0.0626	0.0000	206.2070

3.83 Year 4 Month 10 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.84 Year 4 Month 11 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0546	0.4138	0.4228	7.5000e-004		0.0191	0.0191		0.0180	0.0180	0.0000	62.6578	62.6578	0.0165	0.0000	63.0050
Total	0.0546	0.4138	0.4228	7.5000e-004		0.0191	0.0191		0.0180	0.0180	0.0000	62.6578	62.6578	0.0165	0.0000	63.0050

3.84 Year 4 Month 11 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0107	0.1721	0.4023	7.5000e-004		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	62.6577	62.6577	0.0165	0.0000	63.0049
Total	0.0107	0.1721	0.4023	7.5000e-004		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	62.6577	62.6577	0.0165	0.0000	63.0049

3.84 Year 4 Month 11 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.85 Year 4 Month 12 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0326	0.2458	0.2478	4.5000e-004		0.0115	0.0115		0.0108	0.0108	0.0000	37.9381	37.9381	0.0104	0.0000	38.1573
Total	0.0326	0.2458	0.2478	4.5000e-004		0.0115	0.0115		0.0108	0.0108	0.0000	37.9381	37.9381	0.0104	0.0000	38.1573

3.85 Year 4 Month 12 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.3100e-003	0.1306	0.2413	4.5000e-004		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	37.9381	37.9381	0.0104	0.0000	38.1573
Total	7.3100e-003	0.1306	0.2413	4.5000e-004		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	37.9381	37.9381	0.0104	0.0000	38.1573

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	8.80	4.60	4.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.491782	0.035344	0.208299	0.151084	0.049421	0.007284	0.022101	0.017711	0.002208	0.002109	0.008228	0.001403	0.003026

5.0 Energy Detail

~~4.4 Fleet Mix~~

Historical Energy Use: N

5.1 Mitigation Measures Energy

5.2 Energy by Land Use - NaturalGas

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000					0.0000	0.0000		0.0000							

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000					0.0000	0.0000		0.0000							

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Data retrieval failed for the subreport, 'subWasteDetail', located at: subWasteDetail. Please check the log files for more information.

9.0 Operational Offroad

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

AERA - Santa Barbara - Cat Canyon Construction Equipment Emission Calculations Years 5 thru 11
Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - Anticipated Construction Schedule Provided by the Project Applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

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Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

by the applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Trips and VMT - Employee Trips are included in the offsite calculations.

On-road Fugitive Dust -

Vehicle Trips - Construction Run Only

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust -

Consumer Products - Construction Run Only

Landscape Equipment - Construction Run Only

Construction Off-road Equipment Mitigation - Using Tier 4 Engines to Mitigate Construction Emissions

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	20.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	17.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	105.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	184.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	41.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	31.00
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstructionPhase	NumDays	155,000.00	26.00
tblConstructionPhase	NumDays	155,000.00	26.00
tblConstructionPhase	NumDays	155,000.00	27.00
tblConstructionPhase	NumDays	155,000.00	25.00

tblConstructionPhase	NumDays	155,000.00	27.00
tblConstructionPhase	NumDays	155,000.00	27.00
tblConstructionPhase	NumDays	155,000.00	24.00
tblConstructionPhase	NumDays	155,000.00	26.00
tblConstructionPhase	NumDays	155,000.00	26.00
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tblConstructionPhase	NumDays	155,000.00	26.00
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tblConstructionPhase	PhaseEndDate	3/30/2028	3/31/2028
tblConstructionPhase	PhaseStartDate	8/31/2025	9/1/2025
tblConstructionPhase	PhaseStartDate	11/30/2025	12/1/2025
tblConstructionPhase	PhaseStartDate	2/29/2024	3/1/2024
tblConstructionPhase	PhaseStartDate	5/31/2026	6/1/2026
tblConstructionPhase	PhaseStartDate	1/31/2027	2/1/2027
tblConstructionPhase	PhaseStartDate	2/28/2027	3/1/2027
tblConstructionPhase	PhaseStartDate	3/31/2024	4/1/2024
tblConstructionPhase	PhaseStartDate	10/31/2027	11/1/2027
tblConstructionPhase	PhaseStartDate	2/29/2028	3/1/2028
tblConstructionPhase	PhaseStartDate	4/30/2028	5/1/2028
tblConstructionPhase	PhaseStartDate	12/31/2028	1/1/2029
tblConstructionPhase	PhaseStartDate	6/30/2024	7/1/2024
tblConstructionPhase	PhaseStartDate	9/30/2029	10/1/2029
tblConstructionPhase	PhaseStartDate	3/31/2030	4/1/2030

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tbloffRoadEquipment	HorsePower	208.00	585.00
tbloffRoadEquipment	HorsePower	208.00	207.00
tbloffRoadEquipment	HorsePower	208.00	232.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	9.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	9.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	9.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	9.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00

tbloffRoadEquipment	UsageHours	7.00	10.00
tbloffRoadEquipment	UsageHours	7.00	10.00
tbloffRoadEquipment	UsageHours	8.00	10.00
tbloffRoadEquipment	UsageHours	8.00	10.00
tbloffRoadEquipment	UsageHours	8.00	10.00
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tbloffRoadEquipment	UsageHours	8.00	10.00
tbloffRoadEquipment	UsageHours	7.00	10.00
tbloffRoadEquipment	UsageHours	7.00	10.00

tblOffRoadEquipment	UsageHours	8.00	10.00
tblProjectCharacteristics	OperationalYear	2014	2035
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	3.4085	31.5418	24.7688	0.0628	0.0000	1.3139	1.3139	0.0000	1.2185	1.2185	0.0000	5,425.9485	5,425.9485	1.6571	0.0000	5,460.7467
2025	0.0101	0.1027	0.0563	1.9000e-004	0.0000	4.3600e-003	4.3600e-003	0.0000	4.0100e-003	4.0100e-003	0.0000	16.4295	16.4295	5.3100e-003	0.0000	16.5411
2026	0.2585	2.3623	2.0366	5.2300e-003	0.0000	0.0979	0.0979	0.0000	0.0906	0.0906	0.0000	453.4299	453.4299	0.1397	0.0000	456.3637
2027					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2028	0.2186	2.1319	1.4791	4.9700e-003	0.0000	0.0852	0.0852	0.0000	0.0784	0.0784	0.0000	436.1813	436.1813	0.1411	0.0000	439.1438
2029	0.1097	1.0099	0.7779	1.9700e-003	0.0000	0.0415	0.0415	0.0000	0.0385	0.0385	0.0000	169.5410	169.5410	0.0504	0.0000	170.5988
2030	0.2663	1.0686	2.1272	6.6500e-003	0.0000	0.0335	0.0335	0.0000	0.0335	0.0335	0.0000	592.2853	592.2853	0.0213	0.0000	592.7326
Total	4.2716	38.2171	31.2459	0.0818	0.0000	1.5764	1.5764	0.0000	1.4635	1.4635	0.0000	7,093.8156	7,093.8156	2.0148	0.0000	7,136.1266

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Year 5 Month 1	Building Construction	1/1/2024	1/31/2024	6	27	
2	Year 5 Month 2	Building Construction	2/1/2024	2/28/2024	6	24	
3	Year 5 Month 3	Building Construction	3/1/2024	3/30/2024	6	26	

4	Year 5 Month 4	Building Construction	4/1/2024	4/30/2024	6	26
5	Year 5 Month 5	Building Construction	5/1/2024	5/31/2024	6	27
6	Year 5 Month 6	Building Construction	6/1/2024	6/29/2024	6	25
7	Year 5 Month 7	Building Construction	7/1/2024	7/31/2024	6	27
8	Year 5 Month 8	Building Construction	8/1/2024	8/31/2024	6	27
9	Year 5 Month 9	Building Construction	9/1/2024	9/30/2024	6	25
10	Year 5 Month 10	Building Construction	10/1/2024	10/31/2024	6	27
11	Year 5 Month 11	Building Construction	11/1/2024	11/30/2024	6	26
12	Year 5 Month 12	Building Construction	12/1/2024	12/31/2024	6	26
13	Year 6 Month 1	Building Construction	1/1/2025	1/31/2025	6	27
14	Year 6 Month 2	Building Construction	2/1/2025	2/28/2025	6	24
15	Year 6 Month 3	Building Construction	3/1/2025	3/31/2025	6	26
16	Year 6 Month 4	Building Construction	4/1/2025	4/30/2025	6	26
17	Year 6 Month 5	Building Construction	5/1/2025	5/31/2025	6	27
18	Year 6 Month 6	Building Construction	6/1/2025	6/30/2025	6	25
19	Year 6 Month 7	Building Construction	7/1/2025	7/31/2025	6	27
20	Year 6 Month 8	Building Construction	8/1/2025	8/30/2025	6	26
21	Year 6 Month 9	Building Construction	9/1/2025	9/30/2025	6	26
22	Year 6 Month 10	Building Construction	10/1/2025	10/31/2025	6	27
23	Year 6 Month 11	Building Construction	11/1/2025	11/29/2025	6	25
24	Year 6 Month 12	Building Construction	12/1/2025	12/31/2025	6	27
25	Year 7 Month 1	Building Construction	1/1/2026	1/31/2026	6	27
26	Year 7 Month 2	Building Construction	2/1/2026	2/28/2026	6	24
27	Year 7 Month 3	Building Construction	3/1/2026	3/31/2026	6	26
28	Year 7 Month 4	Building Construction	4/1/2026	4/30/2026	6	26
29	Year 7 Month 5	Building Construction	5/1/2026	5/30/2026	6	26
30	Year 7 Month 6	Building Construction	6/1/2026	6/30/2026	6	26
31	Year 7 Month 7	Building Construction	7/1/2026	7/31/2026	6	27

32	Year 7 Month 8	Building Construction	8/1/2026	8/31/2026	6	26
33	Year 7 Month 9	Building Construction	9/1/2026	9/30/2026	6	26
34	Year 7 Month 10	Building Construction	10/1/2026	10/31/2026	6	27
35	Year 7 Month 11	Building Construction	11/1/2026	11/30/2026	6	25
36	Year 7 Month 12	Building Construction	12/1/2026	12/31/2026	6	27
37	Year 8 Month 1	Building Construction	1/1/2027	1/30/2027	6	26
38	Year 8 Month 2	Building Construction	2/1/2027	2/27/2027	6	24
39	Year 8 Month 3	Building Construction	3/1/2027	3/31/2027	6	27
40	Year 8 Month 4	Building Construction	4/1/2027	4/30/2027	6	26
41	Year 8 Month 5	Building Construction	5/1/2027	5/31/2027	6	26
42	Year 8 Month 6	Building Construction	6/1/2027	6/30/2027	6	26
43	Year 8 Month 7	Building Construction	7/1/2027	7/31/2027	6	27
44	Year 8 Month 8	Building Construction	8/1/2027	8/31/2027	6	26
45	Year 8 Month 9	Building Construction	9/1/2027	9/30/2027	6	26
46	Year 8 Month 10	Building Construction	10/1/2027	10/30/2027	6	26
47	Year 8 Month 11	Building Construction	11/1/2027	11/30/2027	6	26
48	Year 8 Month 12	Building Construction	12/1/2027	12/31/2027	6	27
49	Year 9 Month 1	Building Construction	1/1/2028	1/31/2028	6	26
50	Year 9 Month 2	Building Construction	2/1/2028	2/28/2028	6	24
51	Year 9 Month 3	Building Construction	3/1/2028	3/31/2028	6	27
52	Year 9 Month 4	Building Construction	4/1/2028	4/29/2028	6	25
53	Year 9 Month 5	Building Construction	5/1/2028	5/31/2028	6	27
54	Year 9 Month 6	Building Construction	6/1/2028	6/30/2028	6	26
55	Year 9 Month 7	Building Construction	7/1/2028	7/31/2028	6	26
56	Year 9 Month 8	Building Construction	8/1/2028	8/31/2028	6	27
57	Year 9 Month 9	Building Construction	9/1/2028	9/30/2028	6	26
58	Year 9 Month 10	Building Construction	10/1/2028	10/31/2028	6	26
59	Year 9 Month 11	Building Construction	11/1/2028	11/30/2028	6	26

60	Year 9 Month 12	Building Construction	12/1/2028	12/30/2028	6	26
61	Year 10 Month 1	Building Construction	1/1/2029	1/31/2029	6	27
62	Year 10 Month 2	Building Construction	2/1/2029	2/28/2029	6	24
63	Year 10 Month 3	Building Construction	3/1/2029	3/31/2029	6	27
64	Year 10 Month 4	Building Construction	4/1/2029	4/30/2029	6	25
65	Year 10 Month 5	Building Construction	5/1/2029	5/31/2029	6	27
66	Year 10 Month 6	Building Construction	6/1/2029	6/30/2029	6	26
67	Year 10 Month 7	Building Construction	7/1/2029	7/31/2029	6	26
68	Year 10 Month 8	Building Construction	8/1/2029	8/31/2029	6	27
69	Year 10 Month 9	Building Construction	9/1/2029	9/29/2029	6	25
70	Year 10 Month 10	Building Construction	10/1/2029	10/31/2029	6	27
71	Year 10 Month 11	Building Construction	11/1/2029	11/30/2029	6	26
72	Year 10 Month 12	Building Construction	12/1/2029	12/31/2029	6	26
73	Year 11 Month 1	Building Construction	1/1/2030	1/31/2030	6	27
74	Year 11 Month 2	Building Construction	2/1/2030	2/28/2030	6	24
75	Year 11 Month 3	Building Construction	3/1/2030	3/30/2030	6	26
76	Year 11 Month 4	Building Construction	4/1/2030	4/30/2030	6	26
77	Year 11 Month 5	Building Construction	5/1/2030	5/31/2030	6	27
78	Year 11 Month 6	Building Construction	6/1/2030	6/29/2030	6	25
79	Year 11 Month 7	Building Construction	7/1/2030	7/31/2030	6	27
80	Year 11 Month 8	Building Construction	8/1/2030	8/31/2030	6	27
81	Year 11 Month 9	Building Construction	9/1/2030	9/30/2030	6	25
82	Year 11 Month 10	Building Construction	10/1/2030	10/31/2030	6	27
83	Year 11 Month 11	Building Construction	11/1/2030	11/30/2030	6	26
84	Year 11 Month 12	Building Construction	12/1/2030	12/31/2030	6	26

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Year 5 Month 1	Air Compressors	1	10.00	50	0.48
Year 5 Month 1	Crawler Tractors	9	10.00	232	0.43
Year 5 Month 1	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 1	Crawler Tractors	2	10.00	207	0.43
Year 5 Month 1	Forklifts	2	10.00	73	0.20
Year 5 Month 1	Generator Sets	3	10.00	18	0.74
Year 5 Month 1	Graders	2	10.00	259	0.41
Year 5 Month 1	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 1	Other Construction Equipment	4	10.00	180	0.42
Year 5 Month 1	Other Construction Equipment	3	10.00	210	0.42
Year 5 Month 1	Other Construction Equipment	1	10.00	50	0.42
Year 5 Month 1	Other Construction Equipment	7	10.00	130	0.42
Year 5 Month 1	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 1	Plate Compactors	1	10.00	33	0.43
Year 5 Month 1	Plate Compactors	1	10.00	14	0.43
Year 5 Month 1	Plate Compactors	1	10.00	3	0.43
Year 5 Month 1	Rubber Tired Loaders	1	10.00	125	0.36
Year 5 Month 1	Rubber Tired Loaders	2	10.00	160	0.36
Year 5 Month 1	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 1	Tractors/Loaders/Backhoes	3	10.00	67	0.37
Year 5 Month 1	Welders	1	10.00	48	0.45
Year 5 Month 2	Air Compressors	1	10.00	50	0.48
Year 5 Month 2	Cranes	6	10.00	226	0.29

Year 5 Month 2	Cranes	1	10.00	62	0.29
Year 5 Month 2	Cranes	1	10.00	150	0.29
Year 5 Month 2	Crawler Tractors	9	10.00	232	0.43
Year 5 Month 2	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 2	Crawler Tractors	2	10.00	207	0.43
Year 5 Month 2	Forklifts	2	10.00	73	0.20
Year 5 Month 2	Generator Sets	3	10.00	18	0.74
Year 5 Month 2	Graders	2	10.00	259	0.41
Year 5 Month 2	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 2	Other Construction Equipment	9	10.00	180	0.42
Year 5 Month 2	Other Construction Equipment	3	10.00	210	0.42
Year 5 Month 2	Other Construction Equipment	1	10.00	50	0.42
Year 5 Month 2	Other Construction Equipment	12	10.00	130	0.42
Year 5 Month 2	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 2	Plate Compactors	1	10.00	33	0.43
Year 5 Month 2	Plate Compactors	1	10.00	14	0.43
Year 5 Month 2	Plate Compactors	1	10.00	3	0.43
Year 5 Month 2	Rubber Tired Loaders	1	10.00	125	0.36
Year 5 Month 2	Rubber Tired Loaders	2	10.00	160	0.36
Year 5 Month 2	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 2	Tractors/Loaders/Backhoes	4	10.00	67	0.37
Year 5 Month 2	Welders	1	10.00	48	0.45
Year 5 Month 2	Welders	9	10.00	42	0.45
Year 5 Month 3	Aerial Lifts	1	10.00	60	0.31
Year 5 Month 3	Aerial Lifts	1	10.00	24	0.31
Year 5 Month 3	Air Compressors	2	10.00	50	0.48
Year 5 Month 3	Cranes	6	10.00	226	0.29
Year 5 Month 3	Cranes	1	10.00	62	0.29

Year 5 Month 3	Cranes	1	10.00	150	0.29
Year 5 Month 3	Crawler Tractors	9	10.00	232	0.43
Year 5 Month 3	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 3	Crawler Tractors	2	10.00	207	0.43
Year 5 Month 3	Forklifts	2	10.00	73	0.20
Year 5 Month 3	Generator Sets	4	10.00	18	0.74
Year 5 Month 3	Graders	2	10.00	259	0.41
Year 5 Month 3	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 3	Other Construction Equipment	10	10.00	180	0.42
Year 5 Month 3	Other Construction Equipment	3	10.00	210	0.42
Year 5 Month 3	Other Construction Equipment	2	10.00	50	0.42
Year 5 Month 3	Other Construction Equipment	12	10.00	130	0.42
Year 5 Month 3	Other Construction Equipment	2	10.00	305	0.42
Year 5 Month 3	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 3	Plate Compactors	1	10.00	33	0.43
Year 5 Month 3	Plate Compactors	1	10.00	14	0.43
Year 5 Month 3	Plate Compactors	1	10.00	3	0.43
Year 5 Month 3	Rubber Tired Loaders	1	10.00	125	0.36
Year 5 Month 3	Rubber Tired Loaders	2	10.00	160	0.36
Year 5 Month 3	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 3	Tractors/Loaders/Backhoes	4	10.00	67	0.37
Year 5 Month 3	Welders	2	10.00	48	0.45
Year 5 Month 3	Welders	9	10.00	42	0.45
Year 5 Month 4	Aerial Lifts	1	10.00	60	0.31
Year 5 Month 4	Aerial Lifts	1	10.00	24	0.31
Year 5 Month 4	Air Compressors	2	10.00	50	0.48
Year 5 Month 4	Cranes	7	10.00	226	0.29
Year 5 Month 4	Cranes	1	10.00	62	0.29

Year 5 Month 4	Cranes	1	10.00	150	0.29
Year 5 Month 4	Crawler Tractors	8	10.00	232	0.43
Year 5 Month 4	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 4	Crawler Tractors	2	10.00	207	0.43
Year 5 Month 4	Forklifts	2	10.00	73	0.20
Year 5 Month 4	Generator Sets	4	10.00	18	0.74
Year 5 Month 4	Graders	2	10.00	259	0.41
Year 5 Month 4	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 4	Other Construction Equipment	13	10.00	180	0.42
Year 5 Month 4	Other Construction Equipment	6	10.00	210	0.42
Year 5 Month 4	Other Construction Equipment	2	10.00	50	0.42
Year 5 Month 4	Other Construction Equipment	12	10.00	130	0.42
Year 5 Month 4	Other Construction Equipment	2	10.00	305	0.42
Year 5 Month 4	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 4	Plate Compactors	1	10.00	33	0.43
Year 5 Month 4	Plate Compactors	1	10.00	14	0.43
Year 5 Month 4	Plate Compactors	1	10.00	3	0.43
Year 5 Month 4	Rubber Tired Loaders	1	10.00	125	0.36
Year 5 Month 4	Rubber Tired Loaders	1	10.00	160	0.36
Year 5 Month 4	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 4	Tractors/Loaders/Backhoes	3	10.00	67	0.37
Year 5 Month 4	Welders	2	10.00	48	0.45
Year 5 Month 4	Welders	9	10.00	42	0.45
Year 5 Month 5	Aerial Lifts	1	10.00	60	0.31
Year 5 Month 5	Aerial Lifts	1	10.00	24	0.31
Year 5 Month 5	Air Compressors	2	10.00	50	0.48
Year 5 Month 5	Cranes	6	10.00	226	0.29
Year 5 Month 5	Cranes	1	10.00	62	0.29

Year 5 Month 5	Cranes	1	10.00	150	0.29
Year 5 Month 5	Crawler Tractors	8	10.00	232	0.43
Year 5 Month 5	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 5	Crawler Tractors	2	10.00	207	0.43
Year 5 Month 5	Forklifts	2	10.00	73	0.20
Year 5 Month 5	Generator Sets	4	10.00	18	0.74
Year 5 Month 5	Graders	2	10.00	259	0.41
Year 5 Month 5	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 5	Other Construction Equipment	13	10.00	180	0.42
Year 5 Month 5	Other Construction Equipment	7	10.00	210	0.42
Year 5 Month 5	Other Construction Equipment	2	10.00	50	0.42
Year 5 Month 5	Other Construction Equipment	12	10.00	130	0.42
Year 5 Month 5	Other Construction Equipment	2	10.00	305	0.42
Year 5 Month 5	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 5	Plate Compactors	1	10.00	33	0.43
Year 5 Month 5	Plate Compactors	1	10.00	14	0.43
Year 5 Month 5	Plate Compactors	1	10.00	3	0.43
Year 5 Month 5	Rubber Tired Loaders	1	10.00	125	0.36
Year 5 Month 5	Rubber Tired Loaders	1	10.00	160	0.36
Year 5 Month 5	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 5	Tractors/Loaders/Backhoes	2	10.00	67	0.37
Year 5 Month 5	Welders	4	10.00	48	0.45
Year 5 Month 5	Welders	9	10.00	42	0.45
Year 5 Month 6	Aerial Lifts	1	10.00	60	0.31
Year 5 Month 6	Aerial Lifts	1	10.00	24	0.31
Year 5 Month 6	Air Compressors	2	10.00	50	0.48
Year 5 Month 6	Cranes	5	10.00	226	0.29
Year 5 Month 6	Cranes	2	10.00	62	0.29

Year 5 Month 6	Cranes	1	10.00	150	0.29
Year 5 Month 6	Crawler Tractors	8	10.00	232	0.43
Year 5 Month 6	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 6	Crawler Tractors	2	10.00	207	0.43
Year 5 Month 6	Forklifts	2	10.00	73	0.20
Year 5 Month 6	Generator Sets	4	10.00	18	0.74
Year 5 Month 6	Graders	2	10.00	259	0.41
Year 5 Month 6	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 6	Other Construction Equipment	10	10.00	180	0.42
Year 5 Month 6	Other Construction Equipment	4	10.00	210	0.42
Year 5 Month 6	Other Construction Equipment	2	10.00	50	0.42
Year 5 Month 6	Other Construction Equipment	12	10.00	130	0.42
Year 5 Month 6	Other Construction Equipment	3	10.00	305	0.42
Year 5 Month 6	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 6	Plate Compactors	1	10.00	33	0.43
Year 5 Month 6	Plate Compactors	1	10.00	14	0.43
Year 5 Month 6	Plate Compactors	1	10.00	3	0.43
Year 5 Month 6	Rubber Tired Loaders	1	10.00	125	0.36
Year 5 Month 6	Rubber Tired Loaders	1	10.00	160	0.36
Year 5 Month 6	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 6	Tractors/Loaders/Backhoes	2	10.00	67	0.37
Year 5 Month 6	Welders	4	10.00	48	0.45
Year 5 Month 6	Welders	8	10.00	42	0.45
Year 5 Month 7	Aerial Lifts	1	10.00	60	0.31
Year 5 Month 7	Aerial Lifts	1	10.00	24	0.31
Year 5 Month 7	Air Compressors	2	10.00	50	0.48
Year 5 Month 7	Cranes	5	10.00	226	0.29
Year 5 Month 7	Cranes	2	10.00	62	0.29

Year 5 Month 7	Cranes	1	10.00	150	0.29
Year 5 Month 7	Crawler Tractors	7	10.00	232	0.43
Year 5 Month 7	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 7	Crawler Tractors	2	10.00	207	0.43
Year 5 Month 7	Forklifts	2	10.00	73	0.20
Year 5 Month 7	Generator Sets	4	10.00	18	0.74
Year 5 Month 7	Graders	2	10.00	259	0.41
Year 5 Month 7	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 7	Other Construction Equipment	9	10.00	180	0.42
Year 5 Month 7	Other Construction Equipment	4	10.00	210	0.42
Year 5 Month 7	Other Construction Equipment	2	10.00	50	0.42
Year 5 Month 7	Other Construction Equipment	11	10.00	130	0.42
Year 5 Month 7	Other Construction Equipment	3	10.00	305	0.42
Year 5 Month 7	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 7	Plate Compactors	1	10.00	14	0.43
Year 5 Month 7	Plate Compactors	1	10.00	3	0.43
Year 5 Month 7	Rubber Tired Loaders	1	10.00	125	0.36
Year 5 Month 7	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 7	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 5 Month 7	Welders	4	10.00	48	0.45
Year 5 Month 7	Welders	8	10.00	42	0.45
Year 5 Month 8	Aerial Lifts	1	10.00	60	0.31
Year 5 Month 8	Aerial Lifts	1	10.00	24	0.31
Year 5 Month 8	Air Compressors	1	10.00	50	0.48
Year 5 Month 8	Cranes	5	10.00	226	0.29
Year 5 Month 8	Cranes	2	10.00	62	0.29
Year 5 Month 8	Cranes	1	10.00	150	0.29
Year 5 Month 8	Crawler Tractors	7	10.00	232	0.43

Year 5 Month 8	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 8	Crawler Tractors	2	10.00	207	0.43
Year 5 Month 8	Forklifts	2	10.00	73	0.20
Year 5 Month 8	Generator Sets	3	10.00	18	0.74
Year 5 Month 8	Graders	2	10.00	259	0.41
Year 5 Month 8	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 8	Other Construction Equipment	9	10.00	180	0.42
Year 5 Month 8	Other Construction Equipment	4	10.00	210	0.42
Year 5 Month 8	Other Construction Equipment	2	10.00	50	0.42
Year 5 Month 8	Other Construction Equipment	11	10.00	130	0.42
Year 5 Month 8	Other Construction Equipment	2	10.00	305	0.42
Year 5 Month 8	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 8	Plate Compactors	1	10.00	14	0.43
Year 5 Month 8	Plate Compactors	1	10.00	3	0.43
Year 5 Month 8	Rubber Tired Loaders	1	10.00	125	0.36
Year 5 Month 8	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 8	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 5 Month 8	Welders	4	10.00	48	0.45
Year 5 Month 8	Welders	8	10.00	42	0.45
Year 5 Month 9	Aerial Lifts	1	10.00	60	0.31
Year 5 Month 9	Aerial Lifts	1	10.00	24	0.31
Year 5 Month 9	Air Compressors	1	10.00	50	0.48
Year 5 Month 9	Cranes	3	10.00	226	0.29
Year 5 Month 9	Cranes	1	10.00	62	0.29
Year 5 Month 9	Cranes	1	10.00	150	0.29
Year 5 Month 9	Crawler Tractors	7	10.00	232	0.43
Year 5 Month 9	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 9	Crawler Tractors	2	10.00	207	0.43

Year 5 Month 9	Forklifts	2	10.00	73	0.20
Year 5 Month 9	Generator Sets	3	10.00	18	0.74
Year 5 Month 9	Graders	2	10.00	259	0.41
Year 5 Month 9	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 9	Other Construction Equipment	8	10.00	180	0.42
Year 5 Month 9	Other Construction Equipment	3	10.00	210	0.42
Year 5 Month 9	Other Construction Equipment	2	10.00	50	0.42
Year 5 Month 9	Other Construction Equipment	10	10.00	130	0.42
Year 5 Month 9	Other Construction Equipment	2	10.00	305	0.42
Year 5 Month 9	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 9	Plate Compactors	1	10.00	14	0.43
Year 5 Month 9	Plate Compactors	1	10.00	3	0.43
Year 5 Month 9	Rubber Tired Loaders	1	10.00	125	0.36
Year 5 Month 9	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 9	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 5 Month 9	Welders	4	10.00	48	0.45
Year 5 Month 9	Welders	6	10.00	42	0.45
Year 5 Month 10	Aerial Lifts	1	10.00	60	0.31
Year 5 Month 10	Aerial Lifts	1	10.00	24	0.31
Year 5 Month 10	Air Compressors	1	10.00	50	0.48
Year 5 Month 10	Cranes	3	10.00	226	0.29
Year 5 Month 10	Cranes	1	10.00	62	0.29
Year 5 Month 10	Crawler Tractors	7	10.00	232	0.43
Year 5 Month 10	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 10	Crawler Tractors	2	10.00	207	0.43
Year 5 Month 10	Forklifts	2	10.00	73	0.20
Year 5 Month 10	Generator Sets	3	10.00	18	0.74
Year 5 Month 10	Graders	2	10.00	259	0.41

Year 5 Month 10	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 10	Other Construction Equipment	8	10.00	180	0.42
Year 5 Month 10	Other Construction Equipment	3	10.00	210	0.42
Year 5 Month 10	Other Construction Equipment	1	10.00	50	0.42
Year 5 Month 10	Other Construction Equipment	10	10.00	130	0.42
Year 5 Month 10	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 10	Plate Compactors	1	10.00	3	0.43
Year 5 Month 10	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 10	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 5 Month 10	Welders	2	10.00	48	0.45
Year 5 Month 10	Welders	6	10.00	42	0.45
Year 5 Month 11	Aerial Lifts	1	10.00	60	0.31
Year 5 Month 11	Aerial Lifts	1	10.00	24	0.31
Year 5 Month 11	Air Compressors	1	10.00	50	0.48
Year 5 Month 11	Cranes	1	10.00	62	0.29
Year 5 Month 11	Crawler Tractors	7	10.00	232	0.43
Year 5 Month 11	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 11	Crawler Tractors	2	10.00	207	0.43
Year 5 Month 11	Forklifts	2	10.00	73	0.20
Year 5 Month 11	Generator Sets	3	10.00	18	0.74
Year 5 Month 11	Graders	2	10.00	259	0.41
Year 5 Month 11	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 11	Other Construction Equipment	2	10.00	180	0.42
Year 5 Month 11	Other Construction Equipment	3	10.00	210	0.42
Year 5 Month 11	Other Construction Equipment	1	10.00	50	0.42
Year 5 Month 11	Other Construction Equipment	5	10.00	130	0.42
Year 5 Month 11	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 11	Plate Compactors	1	10.00	3	0.43

Year 5 Month 11	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 11	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 5 Month 11	Welders	1	10.00	48	0.45
Year 5 Month 12	Aerial Lifts	1	10.00	60	0.31
Year 5 Month 12	Aerial Lifts	1	10.00	24	0.31
Year 5 Month 12	Air Compressors	1	10.00	50	0.48
Year 5 Month 12	Cranes	1	10.00	62	0.29
Year 5 Month 12	Crawler Tractors	7	10.00	232	0.43
Year 5 Month 12	Crawler Tractors	2	10.00	585	0.43
Year 5 Month 12	Crawler Tractors	2	10.00	207	0.43
Year 5 Month 12	Forklifts	2	10.00	73	0.20
Year 5 Month 12	Generator Sets	3	10.00	18	0.74
Year 5 Month 12	Graders	2	10.00	259	0.41
Year 5 Month 12	Other Construction Equipment	2	10.00	407	0.42
Year 5 Month 12	Other Construction Equipment	2	10.00	180	0.42
Year 5 Month 12	Other Construction Equipment	3	10.00	210	0.42
Year 5 Month 12	Other Construction Equipment	1	10.00	50	0.42
Year 5 Month 12	Other Construction Equipment	5	10.00	130	0.42
Year 5 Month 12	Other Construction Equipment	1	10.00	273	0.42
Year 5 Month 12	Skid Steer Loaders	1	10.00	45	0.37
Year 5 Month 12	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 5 Month 12	Welders	1	10.00	48	0.45
Year 6 Month 4	Cranes	1	10.00	226	0.29
Year 6 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 6 Month 4	Other Construction Equipment	4	10.00	180	0.42
Year 6 Month 5	Cranes	1	10.00	226	0.29
Year 6 Month 5	Other Construction Equipment	3	10.00	210	0.42
Year 6 Month 5	Other Construction Equipment	4	10.00	180	0.42

Year 7 Month 1	Rubber Tired Loaders	1	10.00	160	0.36
Year 7 Month 1	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 7 Month 1	Crawler Tractors	1	10.00	232	0.43
Year 7 Month 1	Other Construction Equipment	1	10.00	130	0.42
Year 7 Month 1	Other Construction Equipment	1	10.00	180	0.42
Year 7 Month 2	Rubber Tired Loaders	1	10.00	160	0.36
Year 7 Month 2	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 7 Month 2	Crawler Tractors	1	10.00	232	0.43
Year 7 Month 2	Cranes	2	10.00	226	0.29
Year 7 Month 2	Welders	2	10.00	42	0.45
Year 7 Month 2	Other Construction Equipment	2	10.00	130	0.42
Year 7 Month 2	Other Construction Equipment	2	10.00	180	0.42
Year 7 Month 3	Cranes	2	10.00	226	0.29
Year 7 Month 3	Welders	2	10.00	42	0.45
Year 7 Month 3	Other Construction Equipment	1	10.00	130	0.42
Year 7 Month 3	Other Construction Equipment	1	10.00	180	0.42
Year 7 Month 4	Cranes	2	10.00	226	0.29
Year 7 Month 4	Welders	2	10.00	42	0.45
Year 7 Month 4	Other Construction Equipment	1	10.00	130	0.42
Year 7 Month 4	Other Construction Equipment	1	10.00	180	0.42
Year 7 Month 5	Cranes	2	10.00	226	0.29
Year 7 Month 5	Welders	2	10.00	42	0.45
Year 7 Month 5	Other Construction Equipment	1	10.00	130	0.42
Year 7 Month 5	Other Construction Equipment	1	10.00	180	0.42
Year 7 Month 6	Cranes	1	10.00	226	0.29
Year 7 Month 6	Welders	1	10.00	42	0.45
Year 7 Month 6	Other Construction Equipment	1	10.00	130	0.42
Year 7 Month 6	Other Construction Equipment	1	10.00	180	0.42

Year 7 Month 7	Cranes	1	10.00	226	0.29
Year 7 Month 7	Welders	1	10.00	42	0.45
Year 7 Month 7	Other Construction Equipment	1	10.00	130	0.42
Year 7 Month 7	Other Construction Equipment	1	10.00	180	0.42
Year 7 Month 8	Cranes	1	10.00	226	0.29
Year 7 Month 8	Welders	1	10.00	42	0.45
Year 7 Month 8	Other Construction Equipment	1	10.00	130	0.42
Year 7 Month 8	Other Construction Equipment	1	10.00	180	0.42
Year 7 Month 9	Crawler Tractors	2	10.00	232	0.43
Year 7 Month 9	Crawler Tractors	1	10.00	585	0.43
Year 7 Month 9	Crawler Tractors	1	10.00	207	0.43
Year 7 Month 9	Graders	1	10.00	259	0.41
Year 7 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year 7 Month 9	Other Construction Equipment	2	10.00	130	0.42
Year 7 Month 10	Crawler Tractors	2	10.00	232	0.43
Year 7 Month 10	Crawler Tractors	1	10.00	585	0.43
Year 7 Month 10	Crawler Tractors	1	10.00	207	0.43
Year 7 Month 10	Graders	1	10.00	259	0.41
Year 7 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year 7 Month 10	Other Construction Equipment	2	10.00	130	0.42
Year 9 Month 4	Cranes	1	10.00	226	0.29
Year 9 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 9 Month 4	Other Construction Equipment	3	10.00	180	0.42
Year 9 Month 5	Cranes	1	10.00	226	0.29
Year 9 Month 5	Other Construction Equipment	3	10.00	210	0.42
Year 9 Month 5	Other Construction Equipment	3	10.00	180	0.42
Year 9 Month 8	Crawler Tractors	4	10.00	232	0.43
Year 9 Month 8	Crawler Tractors	1	10.00	585	0.43

Year 9 Month 8	Crawler Tractors	1	10.00	207	0.43
Year 9 Month 8	Graders	1	10.00	259	0.41
Year 9 Month 8	Other Construction Equipment	1	10.00	407	0.42
Year 9 Month 8	Other Construction Equipment	2	10.00	130	0.42
Year 9 Month 9	Crawler Tractors	4	10.00	232	0.43
Year 9 Month 9	Crawler Tractors	1	10.00	585	0.43
Year 9 Month 9	Crawler Tractors	1	10.00	207	0.43
Year 9 Month 9	Graders	1	10.00	259	0.41
Year 9 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year 9 Month 9	Other Construction Equipment	2	10.00	130	0.42
Year 9 Month 10	Crawler Tractors	4	10.00	232	0.43
Year 9 Month 10	Crawler Tractors	1	10.00	585	0.43
Year 9 Month 10	Crawler Tractors	1	10.00	207	0.43
Year 9 Month 10	Graders	1	10.00	259	0.41
Year 9 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year 9 Month 10	Other Construction Equipment	2	10.00	130	0.42
Year 10 Month 1	Rubber Tired Loaders	1	10.00	160	0.36
Year 10 Month 1	Crawler Tractors	1	10.00	232	0.43
Year 10 Month 2	Cranes	1	10.00	226	0.29
Year 10 Month 2	Welders	1	10.00	42	0.45
Year 10 Month 3	Cranes	1	10.00	226	0.29
Year 10 Month 3	Welders	1	10.00	42	0.45
Year 10 Month 4	Cranes	2	10.00	226	0.29
Year 10 Month 4	Welders	1	10.00	42	0.45
Year 10 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 10 Month 4	Other Construction Equipment	3	10.00	180	0.42
Year 10 Month 5	Cranes	2	10.00	226	0.29
Year 10 Month 5	Welders	1	10.00	42	0.45

Year 10 Month 5	Other Construction Equipment	3	10.00	210	0.42
Year 10 Month 5	Other Construction Equipment	3	10.00	180	0.42
Year 10 Month 6	Cranes	1	10.00	226	0.29
Year 10 Month 6	Welders	1	10.00	42	0.45
Year 10 Month 7	Cranes	1	10.00	226	0.29
Year 10 Month 7	Welders	1	10.00	42	0.45
Year 10 Month 8	Cranes	1	10.00	226	0.29
Year 10 Month 8	Welders	1	10.00	42	0.45
Year 10 Month 8	Crawler Tractors	1	10.00	232	0.43
Year 10 Month 8	Other Construction Equipment	1	10.00	130	0.42
Year 10 Month 9	Crawler Tractors	1	10.00	232	0.43
Year 10 Month 9	Other Construction Equipment	1	10.00	130	0.42
Year 10 Month 10	Crawler Tractors	1	10.00	232	0.43
Year 10 Month 10	Other Construction Equipment	1	10.00	130	0.42
Year 11 Month 1	Rubber Tired Loaders	1	10.00	160	0.36
Year 11 Month 1	Crawler Tractors	1	10.00	232	0.43
Year 11 Month 1	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 11 Month 1	Other Construction Equipment	1	10.00	130	0.42
Year 11 Month 1	Other Construction Equipment	1	10.00	180	0.42
Year 11 Month 2	Rubber Tired Loaders	1	10.00	160	0.36
Year 11 Month 2	Crawler Tractors	1	10.00	232	0.43
Year 11 Month 2	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 11 Month 2	Other Construction Equipment	2	10.00	130	0.42
Year 11 Month 2	Other Construction Equipment	2	10.00	180	0.42
Year 11 Month 2	Cranes	2	10.00	226	0.29
Year 11 Month 2	Welders	2	10.00	42	0.45
Year 11 Month 3	Rubber Tired Loaders	1	10.00	160	0.36
Year 11 Month 3	Crawler Tractors	1	10.00	232	0.43

Year 11 Month 3	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 11 Month 3	Other Construction Equipment	2	10.00	130	0.42
Year 11 Month 3	Other Construction Equipment	2	10.00	180	0.42
Year 11 Month 3	Cranes	2	10.00	226	0.29
Year 11 Month 3	Welders	2	10.00	42	0.45
Year 11 Month 4	Other Construction Equipment	1	10.00	130	0.42
Year 11 Month 4	Other Construction Equipment	4	10.00	180	0.42
Year 11 Month 4	Cranes	3	10.00	226	0.29
Year 11 Month 4	Welders	2	10.00	42	0.45
Year 11 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 11 Month 5	Other Construction Equipment	1	10.00	130	0.42
Year 11 Month 5	Other Construction Equipment	1	10.00	180	0.42
Year 11 Month 5	Cranes	2	10.00	226	0.29
Year 11 Month 5	Welders	2	10.00	42	0.45
Year 11 Month 6	Other Construction Equipment	1	10.00	130	0.42
Year 11 Month 6	Other Construction Equipment	1	10.00	180	0.42
Year 11 Month 6	Cranes	2	10.00	226	0.29
Year 11 Month 6	Welders	2	10.00	42	0.45
Year 11 Month 7	Other Construction Equipment	1	10.00	130	0.42
Year 11 Month 7	Other Construction Equipment	1	10.00	180	0.42
Year 11 Month 7	Cranes	1	10.00	226	0.29
Year 11 Month 7	Welders	1	10.00	42	0.45
Year 11 Month 8	Other Construction Equipment	1	10.00	130	0.42
Year 11 Month 8	Other Construction Equipment	1	10.00	180	0.42
Year 11 Month 8	Cranes	1	10.00	226	0.29
Year 11 Month 8	Welders	1	10.00	42	0.45
Year 11 Month 9	Crawler Tractors	2	10.00	232	0.43
Year 11 Month 9	Crawler Tractors	1	10.00	585	0.43

Year 11 Month 9	Crawler Tractors	1	10.00	207	0.43
Year 11 Month 9	Graders	1	10.00	259	0.41
Year 11 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year 11 Month 9	Other Construction Equipment	2	10.00	130	0.42
Year 11 Month 10	Crawler Tractors	2	10.00	232	0.43
Year 11 Month 10	Crawler Tractors	1	10.00	585	0.43
Year 11 Month 10	Crawler Tractors	1	10.00	207	0.43
Year 11 Month 10	Graders	1	10.00	259	0.41
Year 11 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year 11 Month 10	Other Construction Equipment	2	10.00	130	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Year 5 Month 1	50	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5 Month 2	78	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5 Month 3	87	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5 Month 4	91	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5 Month 5	92	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5 Month 6	86	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5 Month 7	80	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5 Month 8	77	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5 Month 9	69	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5 Month 10	61	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5 Month 11	40	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5 Month 12	39	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 6 Month 1				0.00	12.30	4.60				
Year 6 Month 2				0.00	12.30	4.60				

Year 6 Month 3				0.00	12.30	4.60					
Year 6 Month 4	8	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 6 Month 5	8	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 6 Month 6				0.00	12.30	4.60					
Year 6 Month 7				0.00	12.30	4.60					
Year 6 Month 8				0.00	12.30	4.60					
Year 6 Month 9				0.00	12.30	4.60					
Year 6 Month 10				0.00	12.30	4.60					
Year 6 Month 11				0.00	12.30	4.60					
Year 6 Month 12				0.00	12.30	4.60					
Year 7 Month 1	5	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 7 Month 2	11	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 7 Month 3	6	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 7 Month 4	6	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 7 Month 5	6	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 7 Month 6	4	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 7 Month 7	4	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 7 Month 8	4	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 7 Month 9	8	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 7 Month 10	8	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 7 Month 11				0.00	12.30	4.60					
Year 7 Month 12				0.00	12.30	4.60					
Year 8 Month 1				0.00	12.30	4.60					
Year 8 Month 2				0.00	12.30	4.60					
Year 8 Month 3				0.00	12.30	4.60					
Year 8 Month 4				0.00	12.30	4.60					
Year 8 Month 5				0.00	12.30	4.60					
Year 8 Month 6				0.00	12.30	4.60					

Year 8 Month 7				0.00	12.30	4.60					
Year 8 Month 8				0.00	12.30	4.60					
Year 8 Month 9				0.00	12.30	4.60					
Year 8 Month 10				0.00	12.30	4.60					
Year 8 Month 11				0.00	12.30	4.60					
Year 8 Month 12				0.00	12.30	4.60					
Year 9 Month 1				0.00	12.30	4.60					
Year 9 Month 2				0.00	12.30	4.60					
Year 9 Month 3				0.00	12.30	4.60					
Year 9 Month 6				0.00	12.30	4.60					
Year 9 Month 7				0.00	12.30	4.60					
Year 9 Month 4	7	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 9 Month 5	7	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 9 Month 11				0.00	12.30	4.60					
Year 9 Month 12				0.00	12.30	4.60					
Year 9 Month 8	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 9 Month 9	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 9 Month 10	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 10 Month 11				0.00	12.30	4.60					
Year 10 Month 12				0.00	12.30	4.60					
Year 10 Month 1	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 10 Month 2	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 10 Month 3	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 10 Month 4	9	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 10 Month 5	9	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 10 Month 6	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 10 Month 7	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	
Year 10 Month 8	4	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT	

Year 10 Month 9	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 10 Month 10	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 11 Month 11				0.00	12.30	4.60				
Year 11 Month 12				0.00	12.30	4.60				
Year 11 Month 1	5	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 11 Month 2	11	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 11 Month 3	11	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 11 Month 4	13	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 11 Month 5	6	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 11 Month 6	6	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 11 Month 7	4	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 11 Month 8	4	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 11 Month 9	8	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 11 Month 10	8	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Clean Paved Roads

3.85 Year 11 Month 12 - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.0 Operational Detail - Mobile

AERA - Santa Barbara - Cat Canyon Construction Equipment Emission Calculations Years 12 thru 18
Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - Anticipated Construction Schedule Provided by the Project Applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00

tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
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tblOffRoadEquipment	UsageHours	8.00	10.00
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tblOffRoadEquipment	UsageHours	8.00	10.00
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tblOffRoadEquipment	UsageHours	8.00	10.00
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tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
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tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblProjectCharacteristics	OperationalYear	2014	2035
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2031	0.3573	1.4230	2.5509	8.7800e-003	0.0000	0.0465	0.0465	0.0000	0.0465	0.0465	0.0000	788.2384	788.2384	0.0286	0.0000	788.8381
2032	0.1053	0.4472	0.9693	2.6900e-003	0.0000	0.0124	0.0124	0.0000	0.0124	0.0124	0.0000	226.9563	226.9563	8.4500e-003	0.0000	227.1338
2033	4.2100e-003	0.0141	0.0216	1.1000e-004	0.0000	4.5000e-004	4.5000e-004	0.0000	4.5000e-004	4.5000e-004	0.0000	9.6840	9.6840	3.4000e-004	0.0000	9.6912
2034	0.2311	0.9325	1.4946	5.5200e-003	0.0000	0.0304	0.0304	0.0000	0.0304	0.0304	0.0000	496.4369	496.4369	0.0185	0.0000	496.8250
2035	0.7101	2.2200	5.7814	0.0195	0.0000	0.0679	0.0679	0.0000	0.0679	0.0679	0.0000	1,756.8662	1,756.8662	0.0565	0.0000	1,758.0536
2036	3.8100e-003	8.7000e-003	0.0215	1.1000e-004	0.0000	3.0000e-004	3.0000e-004	0.0000	3.0000e-004	3.0000e-004	0.0000	9.6840	9.6840	3.1000e-004	0.0000	9.6905
2037	3.8100e-003	8.7000e-003	0.0215	1.1000e-004	0.0000	3.0000e-004	3.0000e-004	0.0000	3.0000e-004	3.0000e-004	0.0000	9.6840	9.6840	3.1000e-004	0.0000	9.6905
Total	1.4156	5.0541	10.8608	0.0369	0.0000	0.1582	0.1582	0.0000	0.1582	0.1582	0.0000	3,297.5499	3,297.5499	0.1130	0.0000	3,299.9226

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Year 12 Month 1	Building Construction	1/1/2031	1/31/2031	6	27	
2	Year 12 Month 2	Building Construction	2/1/2031	2/28/2031	6	24	
3	Year 12 Month 3	Building Construction	3/1/2031	3/31/2031	6	26	

4	Year 12 Month 4	Building Construction	4/1/2031	4/30/2031	6	26
5	Year 12 Month 5	Building Construction	5/1/2031	5/31/2031	6	27
6	Year 12 Month 6	Building Construction	6/1/2031	6/30/2031	6	25
7	Year 12 Month 7	Building Construction	7/1/2031	7/31/2031	6	27
8	Year 12 Month 8	Building Construction	8/1/2031	8/30/2031	6	26
9	Year 12 Month 9	Building Construction	9/1/2031	9/30/2031	6	26
10	Year 12 Month 10	Building Construction	10/1/2031	10/31/2031	6	27
11	Year 12 Month 11	Building Construction	11/1/2031	11/29/2031	6	25
12	Year 12 Month 12	Building Construction	12/1/2031	12/31/2031	6	27
13	Year 13 Month 1	Building Construction	1/1/2032	1/31/2032	6	27
14	Year 13 Month 2	Building Construction	2/1/2032	2/28/2032	6	24
15	Year 13 Month 3	Building Construction	3/1/2032	3/31/2032	6	27
16	Year 13 Month 4	Building Construction	4/1/2032	4/30/2032	6	26
17	Year 13 Month 5	Building Construction	5/1/2032	5/31/2032	6	26
18	Year 13 Month 6	Building Construction	6/1/2032	6/30/2032	6	26
19	Year 13 Month 7	Building Construction	7/1/2032	7/31/2032	6	27
20	Year 13 Month 8	Building Construction	8/1/2032	8/31/2032	6	26
21	Year 13 Month 9	Building Construction	9/1/2032	9/30/2032	6	26
22	Year 13 Month 10	Building Construction	10/1/2032	10/30/2032	6	26
23	Year 13 Month 11	Building Construction	11/1/2032	11/30/2032	6	26
24	Year 13 Month 12	Building Construction	12/1/2032	12/31/2032	6	27
25	Year 14 Month 1	Building Construction	1/1/2033	1/31/2033	6	26
26	Year 14 Month 2	Building Construction	2/1/2033	2/28/2033	6	24
27	Year 14 Month 3	Building Construction	3/1/2033	3/31/2033	6	27
28	Year 14 Month 4	Building Construction	4/1/2033	4/30/2033	6	26
29	Year 14 Month 5	Building Construction	5/1/2033	5/31/2033	6	26
30	Year 14 Month 6	Building Construction	6/1/2033	6/30/2033	6	26
31	Year 14 Month 7	Building Construction	7/1/2033	7/30/2033	6	26

32	Year 14 Month 8	Building Construction	8/1/2033	8/31/2033	6	27
33	Year 14 Month 9	Building Construction	9/1/2033	9/30/2033	6	26
34	Year 14 Month 10	Building Construction	10/1/2033	10/31/2033	6	26
35	Year 14 Month 11	Building Construction	11/1/2033	11/30/2033	6	26
36	Year 14 Month 12	Building Construction	12/1/2033	12/31/2033	6	27
37	Year 15 Month 1	Building Construction	1/1/2034	1/31/2034	6	26
38	Year 15 Month 2	Building Construction	2/1/2034	2/28/2034	6	24
39	Year 15 Month 3	Building Construction	3/1/2034	3/31/2034	6	27
40	Year 15 Month 4	Building Construction	4/1/2034	4/29/2034	6	25
41	Year 15 Month 5	Building Construction	5/1/2034	5/31/2034	6	27
42	Year 15 Month 6	Building Construction	6/1/2034	6/30/2034	6	26
43	Year 15 Month 7	Building Construction	7/1/2034	7/31/2034	6	26
44	Year 15 Month 8	Building Construction	8/1/2034	8/31/2034	6	27
45	Year 15 Month 9	Building Construction	9/1/2034	9/30/2034	6	26
46	Year 15 Month 10	Building Construction	10/1/2034	10/31/2034	6	26
47	Year 15 Month 11	Building Construction	11/1/2034	11/30/2034	6	26
48	Year 15 Month 12	Building Construction	12/1/2034	12/30/2034	6	26
49	Year 16 Month 1	Building Construction	1/1/2035	1/31/2035	6	27
50	Year 16 Month 2	Building Construction	2/1/2035	2/28/2035	6	24
51	Year 16 Month 3	Building Construction	3/1/2035	3/31/2035	6	27
52	Year 16 Month 4	Building Construction	4/1/2035	4/30/2035	6	25
53	Year 16 Month 5	Building Construction	5/1/2035	5/31/2035	6	27
54	Year 16 Month 6	Building Construction	6/1/2035	6/30/2035	6	26
55	Year 16 Month 7	Building Construction	7/1/2035	7/31/2035	6	26
56	Year 16 Month 8	Building Construction	8/1/2035	8/31/2035	6	27
57	Year 16 Month 9	Building Construction	9/1/2035	9/29/2035	6	25
58	Year 16 Month 10	Building Construction	10/1/2035	10/31/2035	6	27
59	Year 16 Month 11	Building Construction	11/1/2035	11/30/2035	6	26

60	Year 16 Month 12	Building Construction	12/1/2035	12/31/2035	6	26
61	Year 17 Month 1	Building Construction	1/1/2036	1/31/2036	6	27
62	Year 17 Month 2	Building Construction	2/1/2036	2/28/2036	6	24
63	Year 17 Month 3	Building Construction	3/1/2036	3/31/2036	6	26
64	Year 17 Month 4	Building Construction	4/1/2036	4/30/2036	6	26
65	Year 17 Month 5	Building Construction	5/1/2036	5/31/2036	6	27
66	Year 17 Month 6	Building Construction	6/1/2036	6/30/2036	6	25
67	Year 17 Month 7	Building Construction	7/1/2036	7/31/2036	6	27
68	Year 17 Month 8	Building Construction	8/1/2036	8/30/2036	6	26
69	Year 17 Month 9	Building Construction	9/1/2036	9/30/2036	6	26
70	Year 17 Month 10	Building Construction	10/1/2036	10/31/2036	6	27
71	Year 17 Month 11	Building Construction	11/1/2036	11/29/2036	6	25
72	Year 17 Month 12	Building Construction	12/1/2036	12/31/2036	6	27
73	Year 18 Month 1	Building Construction	1/1/2037	1/31/2037	6	27
74	Year 18 Month 2	Building Construction	2/1/2037	2/28/2037	6	24
75	Year 18 Month 3	Building Construction	3/1/2037	3/31/2037	6	26
76	Year 18 Month 4	Building Construction	4/1/2037	4/30/2037	6	26
77	Year 18 Month 5	Building Construction	5/1/2037	5/30/2037	6	26
78	Year 18 Month 6	Building Construction	6/1/2037	6/30/2037	6	26
79	Year 18 Month 7	Building Construction	7/1/2037	7/31/2037	6	27
80	Year 18 Month 8	Building Construction	8/1/2037	8/31/2037	6	26
81	Year 18 Month 9	Building Construction	9/1/2037	9/30/2037	6	26
82	Year 18 Month 10	Building Construction	10/1/2037	10/31/2037	6	27
83	Year 18 Month 11	Building Construction	11/1/2037	11/30/2037	6	25
84	Year 18 Month 12	Building Construction	12/1/2037	12/31/2037	6	27

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Year 12 Month 1	Crawler Tractors	1	10.00	232	0.43
Year 12 Month 1	Other Construction Equipment	1	10.00	130	0.42
Year 12 Month 1	Other Construction Equipment	1	10.00	180	0.42
Year 12 Month 1	Rubber Tired Loaders	1	10.00	160	0.36
Year 12 Month 1	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 12 Month 2	Cranes	2	10.00	226	0.29
Year 12 Month 2	Crawler Tractors	1	10.00	232	0.43
Year 12 Month 2	Other Construction Equipment	2	10.00	130	0.42
Year 12 Month 2	Other Construction Equipment	2	10.00	180	0.42
Year 12 Month 2	Rubber Tired Loaders	1	10.00	160	0.36
Year 12 Month 2	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 12 Month 2	Welders	2	10.00	42	0.45
Year 12 Month 3	Cranes	2	10.00	226	0.29
Year 12 Month 3	Other Construction Equipment	1	10.00	130	0.42
Year 12 Month 3	Other Construction Equipment	1	10.00	180	0.42
Year 12 Month 3	Welders	2	10.00	42	0.45
Year 12 Month 4	Cranes	3	10.00	226	0.29
Year 12 Month 4	Other Construction Equipment	1	10.00	130	0.42
Year 12 Month 4	Other Construction Equipment	4	10.00	180	0.42
Year 12 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 12 Month 4	Welders	2	10.00	42	0.45
Year 12 Month 5	Cranes	2	10.00	226	0.29
Year 12 Month 5	Other Construction Equipment	1	10.00	130	0.42

Year 12 Month 5	Other Construction Equipment	1	10.00	180	0.42
Year 12 Month 5	Welders	2	10.00	42	0.45
Year 12 Month 6	Cranes	2	10.00	226	0.29
Year 12 Month 6	Other Construction Equipment	1	10.00	130	0.42
Year 12 Month 6	Other Construction Equipment	1	10.00	180	0.42
Year 12 Month 6	Welders	2	10.00	42	0.45
Year 12 Month 7	Cranes	1	10.00	226	0.29
Year 12 Month 7	Other Construction Equipment	1	10.00	130	0.42
Year 12 Month 7	Other Construction Equipment	1	10.00	180	0.42
Year 12 Month 7	Welders	1	10.00	42	0.45
Year 12 Month 8	Cranes	1	10.00	226	0.29
Year 12 Month 8	Other Construction Equipment	3	10.00	130	0.42
Year 12 Month 8	Other Construction Equipment	1	10.00	180	0.42
Year 12 Month 8	Welders	1	10.00	42	0.45
Year 12 Month 8	Crawler Tractors	4	10.00	232	0.43
Year 12 Month 8	Crawler Tractors	1	10.00	585	0.43
Year 12 Month 8	Crawler Tractors	1	10.00	207	0.43
Year 12 Month 8	Graders	1	10.00	259	0.41
Year 12 Month 8	Other Construction Equipment	1	10.00	407	0.42
Year 12 Month 9	Other Construction Equipment	2	10.00	130	0.42
Year 12 Month 9	Crawler Tractors	4	10.00	232	0.43
Year 12 Month 9	Crawler Tractors	1	10.00	585	0.43
Year 12 Month 9	Crawler Tractors	1	10.00	207	0.43
Year 12 Month 9	Graders	1	10.00	259	0.41
Year 12 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year 12 Month 10	Other Construction Equipment	2	10.00	130	0.42
Year 12 Month 10	Crawler Tractors	4	10.00	232	0.43
Year 12 Month 10	Crawler Tractors	1	10.00	585	0.43

Year 12 Month 10	Crawler Tractors	1	10.00	207	0.43
Year 12 Month 10	Graders	1	10.00	259	0.41
Year 12 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year 13 Month 1	Crawler Tractors	1	10.00	232	0.43
Year 13 Month 1	Rubber Tired Loaders	1	10.00	160	0.36
Year 13 Month 2	Cranes	2	10.00	226	0.29
Year 13 Month 2	Crawler Tractors	1	10.00	232	0.43
Year 13 Month 2	Other Construction Equipment	1	10.00	130	0.42
Year 13 Month 2	Other Construction Equipment	1	10.00	180	0.42
Year 13 Month 2	Rubber Tired Loaders	1	10.00	160	0.36
Year 13 Month 2	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 13 Month 2	Welders	2	10.00	42	0.45
Year 13 Month 3	Cranes	2	10.00	226	0.29
Year 13 Month 3	Other Construction Equipment	1	10.00	130	0.42
Year 13 Month 3	Other Construction Equipment	1	10.00	180	0.42
Year 13 Month 3	Welders	2	10.00	42	0.45
Year 13 Month 4	Cranes	2	10.00	226	0.29
Year 13 Month 4	Other Construction Equipment	1	10.00	130	0.42
Year 13 Month 4	Other Construction Equipment	4	10.00	180	0.42
Year 13 Month 4	Welders	1	10.00	42	0.45
Year 13 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 13 Month 5	Cranes	1	10.00	226	0.29
Year 13 Month 5	Other Construction Equipment	1	10.00	130	0.42
Year 13 Month 5	Other Construction Equipment	1	10.00	180	0.42
Year 13 Month 5	Welders	1	10.00	42	0.45
Year 13 Month 6	Cranes	1	10.00	226	0.29
Year 13 Month 6	Other Construction Equipment	1	10.00	130	0.42
Year 13 Month 6	Other Construction Equipment	1	10.00	180	0.42

Year 13 Month 6	Welders	1	10.00	42	0.45
Year 13 Month 7	Cranes	1	10.00	226	0.29
Year 13 Month 7	Other Construction Equipment	1	10.00	130	0.42
Year 13 Month 7	Other Construction Equipment	1	10.00	180	0.42
Year 13 Month 7	Welders	1	10.00	42	0.45
Year 13 Month 8	Cranes	1	10.00	226	0.29
Year 13 Month 8	Other Construction Equipment	1	10.00	130	0.42
Year 13 Month 8	Other Construction Equipment	1	10.00	180	0.42
Year 13 Month 8	Welders	1	10.00	42	0.45
Year 14 Month 4	Cranes	1	10.00	226	0.29
Year 14 Month 4	Other Construction Equipment	3	10.00	180	0.42
Year 14 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 15 Month 1	Crawler Tractors	1	10.00	232	0.43
Year 15 Month 1	Rubber Tired Loaders	1	10.00	160	0.36
Year 15 Month 2	Cranes	2	10.00	226	0.29
Year 15 Month 2	Crawler Tractors	1	10.00	232	0.43
Year 15 Month 2	Other Construction Equipment	1	10.00	130	0.42
Year 15 Month 2	Other Construction Equipment	1	10.00	180	0.42
Year 15 Month 2	Rubber Tired Loaders	1	10.00	160	0.36
Year 15 Month 2	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 15 Month 2	Welders	2	10.00	42	0.45
Year 15 Month 3	Cranes	1	10.00	226	0.29
Year 15 Month 3	Welders	1	10.00	42	0.45
Year 15 Month 4	Cranes	2	10.00	226	0.29
Year 15 Month 4	Other Construction Equipment	3	10.00	180	0.42
Year 15 Month 4	Welders	1	10.00	42	0.45
Year 15 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 15 Month 5	Cranes	1	10.00	226	0.29

Year 15 Month 5	Welders	1	10.00	42	0.45
Year 15 Month 6	Cranes	1	10.00	226	0.29
Year 15 Month 6	Welders	1	10.00	42	0.45
Year 15 Month 7	Cranes	1	10.00	226	0.29
Year 15 Month 7	Welders	1	10.00	42	0.45
Year 15 Month 8	Cranes	1	10.00	226	0.29
Year 15 Month 8	Welders	1	10.00	42	0.45
Year 15 Month 9	Other Construction Equipment	2	10.00	130	0.42
Year 15 Month 9	Crawler Tractors	4	10.00	232	0.43
Year 15 Month 9	Crawler Tractors	1	10.00	585	0.43
Year 15 Month 9	Crawler Tractors	1	10.00	207	0.43
Year 15 Month 9	Graders	1	10.00	259	0.41
Year 15 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year 15 Month 10	Other Construction Equipment	2	10.00	130	0.42
Year 15 Month 10	Crawler Tractors	4	10.00	232	0.43
Year 15 Month 10	Crawler Tractors	1	10.00	585	0.43
Year 15 Month 10	Crawler Tractors	1	10.00	207	0.43
Year 15 Month 10	Graders	1	10.00	259	0.41
Year 15 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year 16 Month 1	Crawler Tractors	1	10.00	232	0.43
Year 16 Month 1	Other Construction Equipment	1	10.00	130	0.42
Year 16 Month 1	Other Construction Equipment	1	10.00	180	0.42
Year 16 Month 1	Rubber Tired Loaders	1	10.00	160	0.36
Year 16 Month 1	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 16 Month 2	Cranes	3	10.00	226	0.29
Year 16 Month 2	Crawler Tractors	1	10.00	232	0.43
Year 16 Month 2	Other Construction Equipment	4	10.00	130	0.42
Year 16 Month 2	Other Construction Equipment	4	10.00	180	0.42

Year 16 Month 2	Rubber Tired Loaders	1	10.00	160	0.36
Year 16 Month 2	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 16 Month 2	Welders	4	10.00	42	0.45
Year 16 Month 3	Cranes	3	10.00	226	0.29
Year 16 Month 3	Crawler Tractors	1	10.00	232	0.43
Year 16 Month 3	Other Construction Equipment	4	10.00	130	0.42
Year 16 Month 3	Other Construction Equipment	4	10.00	180	0.42
Year 16 Month 3	Rubber Tired Loaders	1	10.00	160	0.36
Year 16 Month 3	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 16 Month 3	Welders	4	10.00	42	0.45
Year 16 Month 4	Cranes	4	10.00	226	0.29
Year 16 Month 4	Crawler Tractors	1	10.00	232	0.43
Year 16 Month 4	Other Construction Equipment	6	10.00	130	0.42
Year 16 Month 4	Other Construction Equipment	7	10.00	180	0.42
Year 16 Month 4	Rubber Tired Loaders	1	10.00	160	0.36
Year 16 Month 4	Tractors/Loaders/Backhoes	1	10.00	67	0.37
Year 16 Month 4	Welders	4	10.00	42	0.45
Year 16 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 16 Month 4	Crawler Tractors	4	10.00	232	0.43
Year 16 Month 4	Crawler Tractors	1	10.00	585	0.43
Year 16 Month 4	Crawler Tractors	1	10.00	207	0.43
Year 16 Month 4	Graders	1	10.00	259	0.41
Year 16 Month 4	Other Construction Equipment	1	10.00	407	0.42
Year 16 Month 5	Cranes	3	10.00	226	0.29
Year 16 Month 5	Other Construction Equipment	5	10.00	130	0.42
Year 16 Month 5	Other Construction Equipment	3	10.00	180	0.42
Year 16 Month 5	Welders	4	10.00	42	0.45
Year 16 Month 5	Crawler Tractors	4	10.00	232	0.43

Year 16 Month 5	Crawler Tractors	1	10.00	585	0.43
Year 16 Month 5	Crawler Tractors	1	10.00	207	0.43
Year 16 Month 5	Graders	1	10.00	259	0.41
Year 16 Month 5	Other Construction Equipment	1	10.00	407	0.42
Year 16 Month 6	Cranes	3	10.00	226	0.29
Year 16 Month 6	Other Construction Equipment	5	10.00	130	0.42
Year 16 Month 6	Other Construction Equipment	3	10.00	180	0.42
Year 16 Month 6	Welders	4	10.00	42	0.45
Year 16 Month 6	Crawler Tractors	4	10.00	232	0.43
Year 16 Month 6	Crawler Tractors	1	10.00	585	0.43
Year 16 Month 6	Crawler Tractors	1	10.00	207	0.43
Year 16 Month 6	Graders	1	10.00	259	0.41
Year 16 Month 6	Other Construction Equipment	1	10.00	407	0.42
Year 16 Month 7	Cranes	3	10.00	226	0.29
Year 16 Month 7	Other Construction Equipment	5	10.00	130	0.42
Year 16 Month 7	Other Construction Equipment	3	10.00	180	0.42
Year 16 Month 7	Welders	4	10.00	42	0.45
Year 16 Month 7	Crawler Tractors	4	10.00	232	0.43
Year 16 Month 7	Crawler Tractors	1	10.00	585	0.43
Year 16 Month 7	Crawler Tractors	1	10.00	207	0.43
Year 16 Month 7	Graders	1	10.00	259	0.41
Year 16 Month 7	Other Construction Equipment	1	10.00	407	0.42
Year 16 Month 8	Cranes	2	10.00	226	0.29
Year 16 Month 8	Other Construction Equipment	5	10.00	130	0.42
Year 16 Month 8	Other Construction Equipment	3	10.00	180	0.42
Year 16 Month 8	Welders	3	10.00	42	0.45
Year 16 Month 8	Crawler Tractors	4	10.00	232	0.43
Year 16 Month 8	Crawler Tractors	1	10.00	585	0.43

Year 16 Month 8	Crawler Tractors	1	10.00	207	0.43
Year 16 Month 8	Graders	1	10.00	259	0.41
Year 16 Month 8	Other Construction Equipment	1	10.00	407	0.42
Year 16 Month 9	Crawler Tractors	4	10.00	232	0.43
Year 16 Month 9	Crawler Tractors	1	10.00	585	0.43
Year 16 Month 9	Crawler Tractors	1	10.00	207	0.43
Year 16 Month 9	Graders	1	10.00	259	0.41
Year 16 Month 9	Other Construction Equipment	1	10.00	407	0.42
Year 16 Month 9	Other Construction Equipment	2	10.00	130	0.42
Year 16 Month 10	Crawler Tractors	4	10.00	232	0.43
Year 16 Month 10	Crawler Tractors	1	10.00	585	0.43
Year 16 Month 10	Crawler Tractors	1	10.00	207	0.43
Year 16 Month 10	Graders	1	10.00	259	0.41
Year 16 Month 10	Other Construction Equipment	1	10.00	407	0.42
Year 16 Month 10	Other Construction Equipment	2	10.00	130	0.42
Year 17 Month 4	Cranes	1	10.00	226	0.29
Year 17 Month 4	Other Construction Equipment	3	10.00	180	0.42
Year 17 Month 4	Other Construction Equipment	3	10.00	210	0.42
Year 18 Month 4	Cranes	1	10.00	226	0.29
Year 18 Month 4	Other Construction Equipment	3	10.00	180	0.42
Year 18 Month 4	Other Construction Equipment	3	10.00	210	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Year 12 Month 1	5	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 12 Month 2	11	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 12 Month 3	6	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

Year 12 Month 4	13	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 12 Month 5	6	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 12 Month 6	6	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 12 Month 7	4	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 12 Month 8	14	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 12 Month 9	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 12 Month 10	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 12 Month 11				0.00	12.30	4.60				
Year 12 Month 12				0.00	12.30	4.60				
Year 13 Month 1	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 13 Month 2	9	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 13 Month 3	6	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 13 Month 4	11	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 13 Month 5	4	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 13 Month 6	4	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 13 Month 7	4	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 13 Month 8	4	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 13 Month 9				0.00	12.30	4.60				
Year 13 Month 10				0.00	12.30	4.60				
Year 13 Month 11				0.00	12.30	4.60				
Year 13 Month 12				0.00	12.30	4.60				
Year 14 Month 1				0.00	12.30	4.60				
Year 14 Month 2				0.00	12.30	4.60				
Year 14 Month 3				0.00	12.30	4.60				
Year 14 Month 4	7	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 14 Month 5				0.00	12.30	4.60				
Year 14 Month 6				0.00	12.30	4.60				
Year 14 Month 7				0.00	12.30	4.60				

Year 14 Month 8				0.00	12.30	4.60				
Year 14 Month 9				0.00	12.30	4.60				
Year 14 Month 10				0.00	12.30	4.60				
Year 14 Month 11				0.00	12.30	4.60				
Year 14 Month 12				0.00	12.30	4.60				
Year 15 Month 1	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 15 Month 11				0.00	12.30	4.60				
Year 15 Month 12				0.00	12.30	4.60				
Year 16 Month 11				0.00	12.30	4.60				
Year 16 Month 12				0.00	12.30	4.60				
Year 15 Month 2	9	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 15 Month 3	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 15 Month 4	9	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 15 Month 5	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 15 Month 6	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 15 Month 7	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 15 Month 8	2	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 15 Month 9	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 15 Month 10	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 17 Month 1				0.00	12.30	4.60				
Year 17 Month 2				0.00	12.30	4.60				
Year 16 Month 1	5	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 16 Month 2	18	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 16 Month 3	18	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 16 Month 4	35	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 16 Month 5	23	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 16 Month 6	23	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 16 Month 7	23	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

Year 16 Month 8	21	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 16 Month 9	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 16 Month 10	10	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 17 Month 3				0.00	12.30	4.60				
Year 17 Month 5				0.00	12.30	4.60				
Year 17 Month 6				0.00	12.30	4.60				
Year 17 Month 7				0.00	12.30	4.60				
Year 17 Month 8				0.00	12.30	4.60				
Year 17 Month 4	7	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 17 Month 9				0.00	12.30	4.60				
Year 17 Month 10				0.00	12.30	4.60				
Year 17 Month 11				0.00	12.30	4.60				
Year 17 Month 12				0.00	12.30	4.60				
Year 18 Month 1				0.00	12.30	4.60				
Year 18 Month 2				0.00	12.30	4.60				
Year 18 Month 3				0.00	12.30	4.60				
Year 18 Month 5				0.00	12.30	4.60				
Year 18 Month 6				0.00	12.30	4.60				
Year 18 Month 7				0.00	12.30	4.60				
Year 18 Month 8				0.00	12.30	4.60				
Year 18 Month 9				0.00	12.30	4.60				
Year 18 Month 10				0.00	12.30	4.60				
Year 18 Month 11				0.00	12.30	4.60				
Year 18 Month 4	7	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 18 Month 12				0.00	12.30	4.60				

3.1 Mitigation Measures Construction

3.85 Year 18 Month 12 - 2037

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.0 Operational Detail - Mobile

AERA - Santa Barbara - Cat Canyon Substation Construction Equipment
Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - Anticipated Construction Schedule Provided by the Project Applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Trips and VMT - Employee Trips are included in the offsite calculations.

On-road Fugitive Dust -

Vehicle Trips - Construction Run Only

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust -

Consumer Products - Construction Run Only

Area Coating -

Landscape Equipment - Construction Run Only

Construction Off-road Equipment Mitigation - Using Tier 4 Final Engines to Mitigate Construction Emissions

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	155,000.00	25.00
tblConstructionPhase	NumDays	155,000.00	27.00
tblConstructionPhase	NumDays	155,000.00	26.00
tblConstructionPhase	NumDays	155,000.00	26.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseStartDate	4/30/2017	5/1/2017
tblLandUse	LotAcreage	0.00	2,100.00
tblOffRoadEquipment	HorsePower	226.00	400.00
tblOffRoadEquipment	HorsePower	89.00	73.00
tblOffRoadEquipment	HorsePower	89.00	73.00
tblOffRoadEquipment	HorsePower	84.00	11.00
tblOffRoadEquipment	HorsePower	84.00	11.00
tblOffRoadEquipment	HorsePower	84.00	11.00
tblOffRoadEquipment	HorsePower	84.00	11.00
tblOffRoadEquipment	HorsePower	97.00	92.00
tblOffRoadEquipment	HorsePower	97.00	92.00
tblOffRoadEquipment	HorsePower	62.00	60.00
tblOffRoadEquipment	HorsePower	62.00	60.00
tblOffRoadEquipment	HorsePower	62.00	60.00
tblOffRoadEquipment	HorsePower	78.00	50.00
tblOffRoadEquipment	HorsePower	78.00	50.00
tblOffRoadEquipment	HorsePower	78.00	50.00
tblOffRoadEquipment	HorsePower	205.00	68.00
tblOffRoadEquipment	HorsePower	9.00	7.00
tblOffRoadEquipment	HorsePower	81.00	6.00
tblOffRoadEquipment	HorsePower	171.00	130.00
tblOffRoadEquipment	HorsePower	171.00	130.00
tblOffRoadEquipment	HorsePower	171.00	180.00
tblOffRoadEquipment	HorsePower	171.00	180.00
tblOffRoadEquipment	HorsePower	171.00	180.00
tblOffRoadEquipment	HorsePower	64.00	45.00
tblOffRoadEquipment	HorsePower	64.00	45.00

tblOffRoadEquipment	UsageHours	7.00	10.00
tblOffRoadEquipment	UsageHours	7.00	10.00
tblProjectCharacteristics	OperationalYear	2014	2035
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Year -3 Month 4	Building Construction	4/1/2017	4/29/2017	6	25	
2	Year -3 Month 5	Building Construction	5/1/2017	5/31/2017	6	27	
3	Year -3 Month 6	Building Construction	6/1/2017	6/30/2017	6	26	
4	Year -3 Month 7	Building Construction	7/1/2017	7/31/2017	6	26	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Year -3 Month 4	Air Compressors	1	10.00	50	0.48
Year -3 Month 4	Bore/Drill Rigs	1	2.00	68	0.50
Year -3 Month 4	Cement and Mortar Mixers	1	10.00	7	0.56
Year -3 Month 4	Concrete/Industrial Saws	1	10.00	6	0.73
Year -3 Month 4	Forklifts	1	10.00	73	0.20
Year -3 Month 4	Generator Sets	2	10.00	11	0.74
Year -3 Month 4	Other Construction Equipment	2	10.00	130	0.42
Year -3 Month 4	Plate Compactors	1	5.00	8	0.43
Year -3 Month 4	Skid Steer Loaders	1	10.00	45	0.37
Year -3 Month 4	Tractors/Loaders/Backhoes	1	10.00	92	0.37
Year -3 Month 5	Aerial Lifts	1	3.00	60	0.31
Year -3 Month 5	Air Compressors	1	10.00	50	0.48
Year -3 Month 5	Forklifts	1	10.00	73	0.20
Year -3 Month 5	Generator Sets	2	10.00	11	0.74
Year -3 Month 5	Other Construction Equipment	2	10.00	130	0.42
Year -3 Month 5	Other Construction Equipment	1	10.00	180	0.42
Year -3 Month 5	Skid Steer Loaders	1	10.00	45	0.37
Year -3 Month 5	Tractors/Loaders/Backhoes	1	10.00	92	0.37
Year -3 Month 5	Trenchers	1	5.00	80	0.50
Year -3 Month 6	Aerial Lifts	1	8.00	60	0.31
Year -3 Month 6	Air Compressors	1	10.00	50	0.48
Year -3 Month 6	Cranes	1	3.00	400	0.29
Year -3 Month 6	Generator Sets	2	10.00	11	0.74
Year -3 Month 6	Other Construction Equipment	1	10.00	180	0.42
Year -3 Month 7	Aerial Lifts	1	6.00	60	0.31
Year -3 Month 7	Generator Sets	1	10.00	11	0.74
Year -3 Month 7	Other Construction Equipment	1	10.00	180	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Year -3 Month 4	12	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 5	11	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 6	6	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -3 Month 7	3	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Clean Paved Roads

3.2 Year -3 Month 4 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0396	0.3200	0.2348	3.4000e-004		0.0193	0.0193		0.0181	0.0181	0.0000	29.3008	29.3008	8.1200e-003	0.0000	29.4713
Total	0.0396	0.3200	0.2348	3.4000e-004		0.0193	0.0193		0.0181	0.0181	0.0000	29.3008	29.3008	8.1200e-003	0.0000	29.4713

3.2 Year -3 Month 4 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.4200e-003	0.0572	0.2112	3.4000e-004		4.5000e-004	4.5000e-004		4.5000e-004	4.5000e-004	0.0000	29.3008	29.3008	8.1200e-003	0.0000	29.4713
Total	4.4200e-003	0.0572	0.2112	3.4000e-004		4.5000e-004	4.5000e-004		4.5000e-004	4.5000e-004	0.0000	29.3008	29.3008	8.1200e-003	0.0000	29.4713

3.2 Year -3 Month 4 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.3 Year -3 Month 5 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0458	0.3749	0.2699	3.8000e-004		0.0234	0.0234		0.0218	0.0218	0.0000	33.3500	33.3500	9.4600e-003	0.0000	33.5487
Total	0.0458	0.3749	0.2699	3.8000e-004		0.0234	0.0234		0.0218	0.0218	0.0000	33.3500	33.3500	9.4600e-003	0.0000	33.5487

3.3 Year -3 Month 5 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.0900e-003	0.0623	0.2487	3.8000e-004		5.3000e-004	5.3000e-004		5.3000e-004	5.3000e-004	0.0000	33.3500	33.3500	9.4600e-003	0.0000	33.5487
Total	5.0900e-003	0.0623	0.2487	3.8000e-004		5.3000e-004	5.3000e-004		5.3000e-004	5.3000e-004	0.0000	33.3500	33.3500	9.4600e-003	0.0000	33.5487

3.3 Year -3 Month 5 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.4 Year -3 Month 6 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0182	0.1184	0.1043	1.5000e-004		6.1900e-003	6.1900e-003		5.9900e-003	5.9900e-003	0.0000	12.3896	12.3896	3.0700e-003	0.0000	12.4540
Total	0.0182	0.1184	0.1043	1.5000e-004		6.1900e-003	6.1900e-003		5.9900e-003	5.9900e-003	0.0000	12.3896	12.3896	3.0700e-003	0.0000	12.4540

3.4 Year -3 Month 6 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9400e-003	0.0331	0.0632	1.5000e-004		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	12.3895	12.3895	3.0700e-003	0.0000	12.4540
Total	1.9400e-003	0.0331	0.0632	1.5000e-004		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	12.3895	12.3895	3.0700e-003	0.0000	12.4540

3.4 Year -3 Month 6 - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.5 Year -3 Month 7 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0900e-003	0.0189	0.0186	3.0000e-005		8.5000e-004	8.5000e-004		8.3000e-004	8.3000e-004	0.0000	2.6487	2.6487	5.8000e-004	0.0000	2.6608
Total	2.0900e-003	0.0189	0.0186	3.0000e-005		8.5000e-004	8.5000e-004		8.3000e-004	8.3000e-004	0.0000	2.6487	2.6487	5.8000e-004	0.0000	2.6608

3.5 Year -3 Month 7 - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.8000e-004	8.7600e-003	0.0118	3.0000e-005		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	2.6487	2.6487	5.8000e-004	0.0000	2.6608
Total	3.8000e-004	8.7600e-003	0.0118	3.0000e-005		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	2.6487	2.6487	5.8000e-004	0.0000	2.6608

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	8.80	4.60	4.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.491782	0.035344	0.208299	0.151084	0.049421	0.007284	0.022101	0.017711	0.002208	0.002109	0.008228	0.001403	0.003026

5.0 Energy Detail

~~4.4 Fleet Mix~~

Historical Energy Use: N

5.1 Mitigation Measures Energy

5.2 Energy by Land Use - NaturalGas

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000					0.0000	0.0000		0.0000							

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000					0.0000	0.0000		0.0000							

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

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

AERA - Santa Barbara - Cat Canyon 115KV Interconnect Construction Equipment
Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - Anticipated Construction Schedule Provided by the Project Applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Trips and VMT - Employee Trips are included in the offsite calculations.

On-road Fugitive Dust -

Vehicle Trips - Construction Run Only

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust -

Consumer Products - Construction Run Only

Landscape Equipment - Construction Run Only

Construction Off-road Equipment Mitigation - Using Tier 4 Final Engines to Mitigate Construction Emissions

Off-road Equipment - Anticipated Equipment and Schedule

Area Coating -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblLandUse	LotAcreage	0.00	2,100.00
tblOffRoadEquipment	HorsePower	171.00	180.00
tblOffRoadEquipment	HorsePower	171.00	210.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	3.00
tblOffRoadEquipment	PhaseName		Year -3
tblOffRoadEquipment	PhaseName		Year -3
tblOffRoadEquipment	UsageHours	7.00	10.00
tblProjectCharacteristics	OperationalYear	2014	2035
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Year -3	Building Construction	5/1/2017	6/30/2017	6	53	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Year -3	Cranes	1	10.00	226	0.29
Year -3	Other Construction Equipment	3	10.00	180	0.42
Year -3	Other Construction Equipment	3	10.00	210	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Year -3	7	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Clean Paved Roads

3.2 Year -3 - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.3000e-003	9.9600e-003	0.0842	1.9000e-004		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	17.3463	17.3463	5.3100e-003	0.0000	17.4579
Total	2.3000e-003	9.9600e-003	0.0842	1.9000e-004		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	17.3463	17.3463	5.3100e-003	0.0000	17.4579

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	8.80	4.60	4.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.491782	0.035344	0.208299	0.151084	0.049421	0.007284	0.022101	0.017711	0.002208	0.002109	0.008228	0.001403	0.003026

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000					0.0000	0.0000		0.0000							

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000					0.0000	0.0000		0.0000							

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

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

AERA - Santa Barbara - Cat Canyon Construction Fugitive Dust Unpaved Road Travel Emission Calculatio
Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - All annual trips were included in 1 day since some years have very limited annual trips. This was a simply way to model the trips in the appropriate year.

Grading -

Consumer Products - Construction Run Only

Landscape Equipment - Construction Run Only

Construction Off-road Equipment Mitigation -

Trips and VMT - Annual trips were all included in one day. Travel is all on paved roads until the site entrance and then an average round trip distance of 0.6 miles was calculated.

On-road Fugitive Dust - This is a unpaved road travel only so % Paved was set to zero.

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	1/2/2025	1/1/2026
tblConstructionPhase	PhaseEndDate	1/2/2026	1/1/2028
tblConstructionPhase	PhaseEndDate	1/3/2028	1/1/2029
tblConstructionPhase	PhaseEndDate	1/2/2029	1/1/2030
tblConstructionPhase	PhaseEndDate	1/2/2030	1/1/2031
tblConstructionPhase	PhaseEndDate	1/2/2031	1/1/2032
tblConstructionPhase	PhaseEndDate	1/2/2032	1/1/2033
tblConstructionPhase	PhaseEndDate	1/3/2033	1/2/2034
tblConstructionPhase	PhaseEndDate	1/3/2034	1/1/2035
tblConstructionPhase	PhaseEndDate	1/2/2035	1/1/2036
tblConstructionPhase	PhaseEndDate	1/3/2017	1/1/2018
tblConstructionPhase	PhaseEndDate	1/2/2036	1/1/2037
tblConstructionPhase	PhaseEndDate	1/2/2018	1/1/2019
tblConstructionPhase	PhaseEndDate	1/2/2019	1/1/2020
tblConstructionPhase	PhaseEndDate	1/2/2020	1/1/2021

tblConstructionPhase	PhaseEndDate	1/2/2021	1/1/2022
tblConstructionPhase	PhaseEndDate	1/3/2022	1/2/2023
tblConstructionPhase	PhaseEndDate	1/3/2023	1/1/2024
tblConstructionPhase	PhaseEndDate	1/2/2024	1/1/2025
tblConstructionPhase	PhaseStartDate	1/2/2025	1/1/2026
tblConstructionPhase	PhaseStartDate	1/2/2026	1/1/2028
tblConstructionPhase	PhaseStartDate	1/2/2028	1/1/2029
tblConstructionPhase	PhaseStartDate	1/2/2029	1/1/2030
tblConstructionPhase	PhaseStartDate	1/2/2030	1/1/2031
tblConstructionPhase	PhaseStartDate	1/2/2031	1/1/2032
tblConstructionPhase	PhaseStartDate	1/2/2032	1/1/2033
tblConstructionPhase	PhaseStartDate	1/2/2033	1/1/2034
tblConstructionPhase	PhaseStartDate	1/3/2034	1/1/2035
tblConstructionPhase	PhaseStartDate	1/2/2035	1/1/2036
tblConstructionPhase	PhaseStartDate	1/3/2017	1/1/2018
tblConstructionPhase	PhaseStartDate	1/2/2036	1/1/2037
tblConstructionPhase	PhaseStartDate	1/2/2018	1/1/2019
tblConstructionPhase	PhaseStartDate	1/2/2019	1/1/2020
tblConstructionPhase	PhaseStartDate	1/2/2020	1/1/2021
tblConstructionPhase	PhaseStartDate	1/2/2021	1/1/2022
tblConstructionPhase	PhaseStartDate	1/2/2022	1/1/2023
tblConstructionPhase	PhaseStartDate	1/3/2023	1/1/2024
tblConstructionPhase	PhaseStartDate	1/2/2024	1/1/2025
tblLandUse	LotAcreage	0.00	2,100.00
tblOnRoadDust	VendorPercentPave	100.00	0.00
tblOnRoadDust	VendorPercentPave	100.00	0.00
tblOnRoadDust	VendorPercentPave	100.00	0.00
tblOnRoadDust	VendorPercentPave	100.00	0.00

tblTripsAndVMT	WorkerTripLength	12.30	0.60
tblTripsAndVMT	WorkerTripLength	12.30	0.60
tblTripsAndVMT	WorkerTripNumber	0.00	5,967.00
tblTripsAndVMT	WorkerTripNumber	0.00	1,632.00
tblTripsAndVMT	WorkerTripNumber	0.00	1,563.00
tblTripsAndVMT	WorkerTripNumber	0.00	886.00
tblTripsAndVMT	WorkerTripNumber	0.00	2,614.00
tblTripsAndVMT	WorkerTripNumber	0.00	2,967.00
tblTripsAndVMT	WorkerTripNumber	0.00	801.00
tblTripsAndVMT	WorkerTripNumber	0.00	156.00
tblTripsAndVMT	WorkerTripNumber	0.00	1,002.00
tblTripsAndVMT	WorkerTripNumber	0.00	7,513.00
tblTripsAndVMT	WorkerTripNumber	0.00	156.00
tblTripsAndVMT	WorkerTripNumber	0.00	57,047.00
tblTripsAndVMT	WorkerTripNumber	0.00	156.00
tblTripsAndVMT	WorkerTripNumber	0.00	70,561.00
tblTripsAndVMT	WorkerTripNumber	0.00	5,054.00
tblTripsAndVMT	WorkerTripNumber	0.00	4,828.00
tblTripsAndVMT	WorkerTripNumber	0.00	1,732.00
tblTripsAndVMT	WorkerTripNumber	0.00	25,090.00
tblTripsAndVMT	WorkerTripNumber	0.00	35,554.00
tblTripsAndVMT	WorkerTripNumber	0.00	312.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	-3	Grading	1/1/2017	1/2/2017	6	1	
2	-2	Grading	1/1/2018	1/1/2018	6	1	
3	-1	Grading	1/1/2019	1/1/2019	6	1	
4	1	Grading	1/1/2020	1/1/2020	6	1	
5	2	Grading	1/1/2021	1/1/2021	6	1	
6	3	Grading	1/1/2022	1/1/2022	6	1	
7	4	Grading	1/1/2023	1/2/2023	6	1	
8	5	Grading	1/1/2024	1/1/2024	6	1	
9	6	Grading	1/1/2025	1/1/2025	6	1	
10	7	Grading	1/1/2026	1/1/2026	6	1	
11	9	Grading	1/1/2028	1/1/2028	6	1	
12	10	Grading	1/1/2029	1/1/2029	6	1	
13	11	Grading	1/1/2030	1/1/2030	6	1	
14	12	Grading	1/1/2031	1/1/2031	6	1	
15	13	Grading	1/1/2032	1/1/2032	6	1	
16	14	Grading	1/1/2033	1/1/2033	6	1	
17	15	Grading	1/1/2034	1/2/2034	6	1	
18	16	Grading	1/1/2035	1/1/2035	6	1	
19	17	Grading	1/1/2036	1/1/2036	6	1	
20	18	Grading	1/1/2037	1/1/2037	6	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
-3	0	5,967.00	211.00	0.00	0.60	0.60		LD_Mix	HHDT	
7	0	1,632.00	1.00	0.00	0.60	0.60		LD_Mix	HHDT	
9	0	1,563.00	2.00	0.00	0.60	0.60		LD_Mix	HHDT	
10	0	886.00	2.00	0.00	0.60	0.60		LD_Mix	HHDT	
11	0	2,614.00	2.00	0.00	0.60	0.60		LD_Mix	HHDT	
12	0	2,967.00	2.00	0.00	0.60	0.60		LD_Mix	HHDT	
13	0	801.00	1.00	0.00	0.60	0.60		LD_Mix	HHDT	
14	0	156.00	0.00	0.00	0.60	0.60		LD_Mix	HHDT	
15	0	1,002.00	0.00	0.00	0.60	0.60		LD_Mix	HHDT	
16	0	7,513.00	5.00	0.00	0.60	0.60		LD_Mix	HHDT	
17	0	156.00	0.00	0.00	0.60	0.60		LD_Mix	HHDT	
-2	0	57,047.00	1,278.00	0.00	0.60	0.60		LD_Mix	HHDT	
18	0	156.00	0.00	0.00	0.60	0.60		LD_Mix	HHDT	
-1	0	70,561.00	737.00	0.00	0.60	0.60		LD_Mix	HHDT	
1	0	5,054.00	8.00	0.00	0.60	0.60		LD_Mix	HHDT	
2	0	4,828.00	8.00	0.00	0.60	0.60		LD_Mix	HHDT	
3	0	1,732.00	5.00	0.00	0.60	0.60		LD_Mix	HHDT	
4	0	25,090.00	470.00	0.00	0.60	0.60		LD_Mix	HHDT	
5	0	35,554.00	576.00	0.00	0.60	0.60		LD_Mix	HHDT	
6	0	312.00	2.00	0.00	0.60	0.60		LD_Mix	HHDT	

3.1 Mitigation Measures Construction

AERA - Santa Barbara - Cat Canyon Construction Fugitive Dust Grading Emission Calculations

Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - Estimated work schedule

Grading - Estimated additional acreage to be disturbed for grading during the project construction.

Consumer Products - Construction Run Only

Landscape Equipment - Construction Run Only

Construction Off-road Equipment Mitigation -

Off-road Equipment -

Area Coating -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstructionPhase	NumDays	15,500.00	313.00
tblConstructionPhase	NumDays	15,500.00	313.00
tblConstructionPhase	NumDays	15,500.00	313.00
tblConstructionPhase	NumDays	15,500.00	313.00
tblConstructionPhase	NumDays	15,500.00	313.00
tblConstructionPhase	NumDays	15,500.00	313.00
tblConstructionPhase	NumDays	15,500.00	313.00
tblConstructionPhase	NumDays	15,500.00	313.00
tblConstructionPhase	NumDays	15,500.00	313.00
tblConstructionPhase	NumDays	15,500.00	313.00
tblConstructionPhase	NumDays	15,500.00	313.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	1/1/2018	12/31/2017
tblConstructionPhase	PhaseEndDate	12/30/2032	12/31/2034
tblConstructionPhase	PhaseEndDate	12/30/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	12/31/2021	12/31/2024

tblConstructionPhase	PhaseEndDate	12/31/2025	12/31/2026
tblConstructionPhase	PhaseEndDate	12/31/2027	12/31/2029
tblConstructionPhase	PhaseStartDate	1/1/2032	1/1/2034
tblConstructionPhase	PhaseStartDate	1/1/2021	1/1/2024
tblConstructionPhase	PhaseStartDate	1/1/2025	1/1/2026
tblConstructionPhase	PhaseStartDate	1/1/2027	1/1/2029
tblLandUse	LotAcreage	0.00	2,100.00
tblProjectCharacteristics	OperationalYear	2014	2035
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	-3	Grading	1/1/2017	12/31/2017	6	313	
2	-2	Grading	1/1/2018	12/31/2018	6	313	
3	-1	Grading	1/1/2019	12/31/2019	6	313	
4	1	Grading	1/1/2020	12/31/2020	6	313	
5	5	Grading	1/1/2024	12/31/2024	6	313	
6	7	Grading	1/1/2026	12/31/2026	6	313	
7	10	Grading	1/1/2029	12/31/2029	6	313	
8	11	Grading	1/1/2030	12/31/2030	6	313	
9	12	Grading	1/1/2031	12/31/2031	6	313	
10	15	Grading	1/1/2034	12/31/2034	6	313	
11	16	Grading	1/1/2035	12/31/2035	6	313	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
-3				0.00	12.30	4.60				
15				0.00	12.30	4.60				
16				0.00	12.30	4.60				
-2				0.00	12.30	4.60				
-1				0.00	12.30	4.60				
1				0.00	12.30	4.60				
5				0.00	12.30	4.60				
7				0.00	12.30	4.60				
10				0.00	12.30	4.60				
11				0.00	12.30	4.60				
12				0.00	12.30	4.60				

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.12 16 - 2035

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.4500e-003	0.0000	7.4500e-003	8.0000e-004	0.0000	8.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					7.4500e-003	0.0000	7.4500e-003	8.0000e-004	0.0000	8.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	8.80	4.60	4.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.491782	0.035344	0.208299	0.151084	0.049421	0.007284	0.022101	0.017711	0.002208	0.002109	0.008228	0.001403	0.003026

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000					0.0000	0.0000		0.0000							

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000					0.0000	0.0000		0.0000							

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

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

AERA - Santa Barbara - Cat Canyon Construction Fugitive Dust Cut/Fill Emission Calculations

Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - Construction Schedule

Grading - Estimated cut and fill during the project construction. Grading emissions are calculated in a separate model run.

Consumer Products - Construction Run Only

Landscape Equipment - Construction Run Only

Construction Off-road Equipment Mitigation -

Off-road Equipment -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	15,500.00	312.00

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	12/30/2017	12/31/2017
tblConstructionPhase	PhaseEndDate	12/31/2027	12/31/2028
tblConstructionPhase	PhaseEndDate	12/30/2032	12/31/2034
tblConstructionPhase	PhaseEndDate	12/30/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	1/1/2024	12/31/2023
tblConstructionPhase	PhaseEndDate	12/30/2024	12/31/2024
tblConstructionPhase	PhaseEndDate	12/31/2025	12/31/2026
tblConstructionPhase	PhaseStartDate	1/1/2027	1/1/2028
tblConstructionPhase	PhaseStartDate	1/1/2032	1/1/2034
tblConstructionPhase	PhaseStartDate	1/1/2025	1/1/2026
tblGrading	MaterialExported	0.00	521,238.00
tblGrading	MaterialExported	0.00	42,099.00
tblGrading	MaterialExported	0.00	25,199.00
tblGrading	MaterialExported	0.00	78,439.00
tblGrading	MaterialExported	0.00	11,997.00
tblGrading	MaterialExported	0.00	177,032.00
tblGrading	MaterialExported	0.00	435,779.00
tblGrading	MaterialExported	0.00	284,010.00
tblGrading	MaterialExported	0.00	121,268.00
tblGrading	MaterialExported	0.00	1,444,936.00
tblGrading	MaterialExported	0.00	6,276.00
tblGrading	MaterialImported	0.00	266,903.00
tblGrading	MaterialImported	0.00	13,573.00
tblGrading	MaterialImported	0.00	207,038.00
tblGrading	MaterialImported	0.00	17,828.00
tblGrading	MaterialImported	0.00	501,266.00
tblGrading	MaterialImported	0.00	310,882.00

tblGrading	MaterialImported	0.00	768,987.00
tblGrading	MaterialImported	0.00	35,804.00
tblGrading	MaterialImported	0.00	975,163.00
tblGrading	MaterialImported	0.00	13,724.00
tblLandUse	LotAcreage	0.00	2,100.00
tblProjectCharacteristics	OperationalYear	2014	2035
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Year	tons/yr										MT/yr						
2017					0.0696			0.0105									
2018					0.0659			9.9800e-003									
2019					0.0930			0.0141									
2020					0.0139			2.1100e-003									
2021					0.0000			0.0000									
2022					0.0000			0.0000									
2023					0.0000			0.0000									
2024					0.2144			0.0325									
2026					1.7700e-003			2.7000e-004									
2028					0.0000			0.0000									
2029					3.7200e-003			5.6000e-004									
2030					3.4200e-003			5.2000e-004									
2031					0.0252			3.8200e-003									
2034					2.6300e-003			4.0000e-004									
2035					0.0599			9.0700e-003									
Total					0.5535			0.0838									

2.1 Overall Construction

Mitigated Construction

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	-3	Grading	1/1/2017	12/31/2017	6	312	
2	-2	Grading	1/1/2018	12/31/2018	6	313	
3	-1	Grading	1/1/2019	12/31/2019	6	313	
4	1	Grading	1/1/2020	12/31/2020	6	313	
5	2	Grading	1/1/2021	12/31/2021	6	313	
6	3	Grading	1/1/2022	12/31/2022	6	313	
7	4	Grading	1/1/2023	12/31/2023	6	313	
8	5	Grading	1/1/2024	12/31/2024	6	313	
9	7	Grading	1/1/2026	12/31/2026	6	313	
10	9	Grading	1/1/2028	12/31/2028	6	313	
11	10	Grading	1/1/2029	12/31/2029	6	313	
12	11	Grading	1/1/2030	12/31/2030	6	313	
13	12	Grading	1/1/2031	12/31/2031	6	313	
14	15	Grading	1/1/2034	12/31/2034	6	313	
15	16	Grading	1/1/2035	12/31/2035	6	313	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
-3				0.00	12.30	4.60				
9				0.00	12.30	4.60				
10				0.00	12.30	4.60				
11				0.00	12.30	4.60				
12				0.00	12.30	4.60				
15				0.00	12.30	4.60				
16				0.00	12.30	4.60				
-2				0.00	12.30	4.60				
-1				0.00	12.30	4.60				
1				0.00	12.30	4.60				
2				0.00	12.30	4.60				
3				0.00	12.30	4.60				
4				0.00	12.30	4.60				
5				0.00	12.30	4.60				
7				0.00	12.30	4.60				

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.16 16 - 2035

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Fugitive Dust					0.0234			3.5400e-003									
Total					0.0234			3.5400e-003									

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling					0.0000			0.0000									
Vendor					0.0000			0.0000									
Worker					0.0000			0.0000									
Total					0.0000			0.0000									

4.0 Operational Detail - Mobile

AERA - Santa Barbara - Cat Canyon Drilling Equipment Emission Calculations Years All
Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - Anticipated Construction Schedule Provided by the Project Applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

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Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Trips and VMT - Employee Trips are included in the offsite calculations.

On-road Fugitive Dust -

Vehicle Trips - Construction Run Only

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust -

Consumer Products - Construction Run Only

Landscape Equipment - Construction Run Only

Construction Off-road Equipment Mitigation - Using Tier 4 Engines to Mitigate Construction Emissions

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	62.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	88.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	312.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	31.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	31.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	105.00
tblConstructionPhase	NumDays	155,000.00	158.00
tblConstructionPhase	NumDays	155,000.00	106.00
tblConstructionPhase	NumDays	155,000.00	130.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	131.00
tblConstructionPhase	NumDays	155,000.00	287.00
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDays	155,000.00	313.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	51.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	26.00
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDays	155,000.00	52.00

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	12/30/2027	10/31/2028
tblConstructionPhase	PhaseEndDate	3/2/2029	10/31/2029
tblConstructionPhase	PhaseEndDate	5/3/2030	10/31/2030
tblConstructionPhase	PhaseEndDate	3/4/2031	10/31/2031
tblConstructionPhase	PhaseEndDate	3/31/2032	10/29/2032
tblConstructionPhase	PhaseEndDate	12/29/2032	10/31/2033
tblConstructionPhase	PhaseEndDate	4/1/2034	10/31/2034
tblConstructionPhase	PhaseEndDate	10/1/2035	11/30/2035
tblConstructionPhase	PhaseEndDate	1/31/2036	10/31/2036
tblConstructionPhase	PhaseEndDate	1/1/2037	10/31/2037
tblConstructionPhase	PhaseEndDate	10/31/2019	12/31/2019
tblConstructionPhase	PhaseEndDate	12/31/2037	10/30/2038
tblConstructionPhase	PhaseEndDate	12/29/2038	10/29/2039
tblConstructionPhase	PhaseEndDate	12/29/2039	10/31/2040
tblConstructionPhase	PhaseEndDate	12/31/2040	10/31/2041
tblConstructionPhase	PhaseEndDate	1/1/2042	10/31/2042
tblConstructionPhase	PhaseEndDate	1/1/2043	10/31/2043
tblConstructionPhase	PhaseEndDate	12/31/2043	10/31/2044
tblConstructionPhase	PhaseEndDate	12/30/2044	10/31/2045

tblConstructionPhase	PhaseEndDate	12/30/2045	10/31/2046
tblConstructionPhase	PhaseEndDate	12/31/2046	10/31/2047
tblConstructionPhase	PhaseEndDate	1/30/2020	10/30/2021
tblConstructionPhase	PhaseEndDate	1/1/2048	10/31/2048
tblConstructionPhase	PhaseEndDate	12/31/2048	10/31/2049
tblConstructionPhase	PhaseEndDate	11/30/2021	10/31/2022
tblConstructionPhase	PhaseEndDate	11/30/2022	10/31/2023
tblConstructionPhase	PhaseEndDate	10/31/2024	12/31/2024
tblConstructionPhase	PhaseEndDate	3/3/2025	10/31/2025
tblConstructionPhase	PhaseEndDate	4/3/2026	10/31/2026
tblConstructionPhase	PhaseEndDate	12/31/2026	10/30/2027
tblConstructionPhase	PhaseStartDate	10/31/2027	9/1/2028
tblConstructionPhase	PhaseStartDate	11/1/2028	7/1/2029
tblConstructionPhase	PhaseStartDate	11/1/2029	5/1/2030
tblConstructionPhase	PhaseStartDate	11/1/2030	7/1/2031
tblConstructionPhase	PhaseStartDate	11/1/2031	6/1/2032
tblConstructionPhase	PhaseStartDate	10/30/2032	9/1/2033
tblConstructionPhase	PhaseStartDate	11/1/2033	6/1/2034
tblConstructionPhase	PhaseStartDate	11/1/2034	1/1/2035
tblConstructionPhase	PhaseStartDate	12/1/2035	9/1/2036
tblConstructionPhase	PhaseStartDate	11/1/2036	9/1/2037
tblConstructionPhase	PhaseStartDate	11/1/2018	1/1/2019
tblConstructionPhase	PhaseStartDate	11/1/2037	9/1/2038
tblConstructionPhase	PhaseStartDate	10/31/2038	9/1/2039
tblConstructionPhase	PhaseStartDate	10/30/2039	9/1/2040
tblConstructionPhase	PhaseStartDate	11/1/2040	9/1/2041
tblConstructionPhase	PhaseStartDate	11/1/2041	9/1/2042
tblConstructionPhase	PhaseStartDate	11/1/2042	9/1/2043

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tbloffRoadEquipment	UsageHours	7.00	0.77
tbloffRoadEquipment	UsageHours	7.00	2.83
tbloffRoadEquipment	UsageHours	7.00	0.75
tbloffRoadEquipment	UsageHours	7.00	3.18
tbloffRoadEquipment	UsageHours	7.00	0.91
tbloffRoadEquipment	UsageHours	7.00	3.35
tbloffRoadEquipment	UsageHours	7.00	0.99
tbloffRoadEquipment	UsageHours	7.00	3.03
tbloffRoadEquipment	UsageHours	7.00	0.91
tbloffRoadEquipment	UsageHours	7.00	2.90
tbloffRoadEquipment	UsageHours	7.00	1.00
tbloffRoadEquipment	UsageHours	7.00	3.47
tbloffRoadEquipment	UsageHours	7.00	1.05
tbloffRoadEquipment	UsageHours	7.00	3.01
tbloffRoadEquipment	UsageHours	7.00	0.89
tbloffRoadEquipment	UsageHours	7.00	3.96
tbloffRoadEquipment	UsageHours	7.00	1.32
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tbloffRoadEquipment	UsageHours	7.00	5.26
tbloffRoadEquipment	UsageHours	7.00	1.16
tbloffRoadEquipment	UsageHours	7.00	4.04
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tbloffRoadEquipment	UsageHours	7.00	1.32
tbloffRoadEquipment	UsageHours	7.00	4.04
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	4.04
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	4.04
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	4.04
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	4.04
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	1.54
tbloffRoadEquipment	UsageHours	7.00	0.38
tbloffRoadEquipment	UsageHours	7.00	3.96
tbloffRoadEquipment	UsageHours	7.00	1.32
tbloffRoadEquipment	UsageHours	7.00	4.04
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	2.31
tbloffRoadEquipment	UsageHours	7.00	0.77
tbloffRoadEquipment	UsageHours	7.00	2.31
tbloffRoadEquipment	UsageHours	7.00	0.77
tbloffRoadEquipment	UsageHours	7.00	5.92
tbloffRoadEquipment	UsageHours	7.00	1.52
tbloffRoadEquipment	UsageHours	7.00	1.51
tbloffRoadEquipment	UsageHours	7.00	0.38
tbloffRoadEquipment	UsageHours	7.00	2.39

tbloffRoadEquipment	UsageHours	7.00	0.62
tbloffRoadEquipment	UsageHours	7.00	2.69
tbloffRoadEquipment	UsageHours	7.00	0.77
tbloffRoadEquipment	UsageHours	8.00	19.62
tbloffRoadEquipment	UsageHours	8.00	14.54
tbloffRoadEquipment	UsageHours	8.00	19.15
tbloffRoadEquipment	UsageHours	8.00	14.22
tbloffRoadEquipment	UsageHours	8.00	12.82
tbloffRoadEquipment	UsageHours	8.00	19.06
tbloffRoadEquipment	UsageHours	8.00	13.28
tbloffRoadEquipment	UsageHours	8.00	19.73
tbloffRoadEquipment	UsageHours	8.00	13.50
tbloffRoadEquipment	UsageHours	8.00	20.05
tbloffRoadEquipment	UsageHours	8.00	12.03
tbloffRoadEquipment	UsageHours	8.00	17.86
tbloffRoadEquipment	UsageHours	8.00	19.60
tbloffRoadEquipment	UsageHours	8.00	14.50
tbloffRoadEquipment	UsageHours	8.00	13.49
tbloffRoadEquipment	UsageHours	8.00	20.03
tbloffRoadEquipment	UsageHours	8.00	13.42
tbloffRoadEquipment	UsageHours	8.00	19.93
tbloffRoadEquipment	UsageHours	8.00	13.47
tbloffRoadEquipment	UsageHours	8.00	19.97
tbloffRoadEquipment	UsageHours	8.00	13.47
tbloffRoadEquipment	UsageHours	8.00	19.97
tbloffRoadEquipment	UsageHours	8.00	17.51
tbloffRoadEquipment	UsageHours	8.00	19.56
tbloffRoadEquipment	UsageHours	8.00	13.73

tbloffRoadEquipment	UsageHours	8.00	20.35
tbloffRoadEquipment	UsageHours	8.00	14.00
tbloffRoadEquipment	UsageHours	8.00	20.75
tbloffRoadEquipment	UsageHours	8.00	13.73
tbloffRoadEquipment	UsageHours	8.00	20.35
tbloffRoadEquipment	UsageHours	8.00	13.73
tbloffRoadEquipment	UsageHours	8.00	20.35
tbloffRoadEquipment	UsageHours	8.00	13.47
tbloffRoadEquipment	UsageHours	8.00	19.97
tbloffRoadEquipment	UsageHours	8.00	13.47
tbloffRoadEquipment	UsageHours	8.00	19.97
tbloffRoadEquipment	UsageHours	8.00	13.73
tbloffRoadEquipment	UsageHours	8.00	20.35
tbloffRoadEquipment	UsageHours	8.00	13.73
tbloffRoadEquipment	UsageHours	8.00	20.35
tbloffRoadEquipment	UsageHours	8.00	13.73
tbloffRoadEquipment	UsageHours	8.00	20.35
tbloffRoadEquipment	UsageHours	8.00	13.73
tbloffRoadEquipment	UsageHours	8.00	20.35
tbloffRoadEquipment	UsageHours	8.00	13.73
tbloffRoadEquipment	UsageHours	8.00	20.35
tbloffRoadEquipment	UsageHours	8.00	14.77
tbloffRoadEquipment	UsageHours	8.00	10.98
tbloffRoadEquipment	UsageHours	8.00	13.47
tbloffRoadEquipment	UsageHours	8.00	19.97
tbloffRoadEquipment	UsageHours	8.00	13.73
tbloffRoadEquipment	UsageHours	8.00	20.35
tbloffRoadEquipment	UsageHours	8.00	15.69
tbloffRoadEquipment	UsageHours	8.00	11.63
tbloffRoadEquipment	UsageHours	8.00	15.69

tbloffRoadEquipment	UsageHours	8.00	11.63
tbloffRoadEquipment	UsageHours	8.00	18.52
tbloffRoadEquipment	UsageHours	8.00	20.66
tbloffRoadEquipment	UsageHours	8.00	14.49
tbloffRoadEquipment	UsageHours	8.00	10.78
tbloffRoadEquipment	UsageHours	8.00	22.22
tbloffRoadEquipment	UsageHours	8.00	16.52
tbloffRoadEquipment	UsageHours	8.00	22.62
tbloffRoadEquipment	UsageHours	8.00	16.80
tbloffRoadEquipment	UsageHours	7.00	0.96
tbloffRoadEquipment	UsageHours	7.00	0.96
tbloffRoadEquipment	UsageHours	7.00	1.32
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	1.37
tbloffRoadEquipment	UsageHours	7.00	1.22
tbloffRoadEquipment	UsageHours	7.00	1.00
tbloffRoadEquipment	UsageHours	7.00	1.36
tbloffRoadEquipment	UsageHours	7.00	1.24
tbloffRoadEquipment	UsageHours	7.00	1.32
tbloffRoadEquipment	UsageHours	7.00	1.32
tbloffRoadEquipment	UsageHours	7.00	2.95
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	1.37
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	1.32
tbloffRoadEquipment	UsageHours	7.00	1.32
tbloffRoadEquipment	UsageHours	7.00	1.35

tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	0.77
tbloffRoadEquipment	UsageHours	7.00	1.32
tbloffRoadEquipment	UsageHours	7.00	1.35
tbloffRoadEquipment	UsageHours	7.00	0.77
tbloffRoadEquipment	UsageHours	7.00	0.77
tbloffRoadEquipment	UsageHours	7.00	2.89
tbloffRoadEquipment	UsageHours	7.00	0.75
tbloffRoadEquipment	UsageHours	7.00	1.15
tbloffRoadEquipment	UsageHours	7.00	1.15
tbloffRoadEquipment	UsageHours	8.00	2.88
tbloffRoadEquipment	UsageHours	8.00	2.88
tbloffRoadEquipment	UsageHours	8.00	3.97
tbloffRoadEquipment	UsageHours	8.00	4.06
tbloffRoadEquipment	UsageHours	8.00	4.10
tbloffRoadEquipment	UsageHours	8.00	3.65
tbloffRoadEquipment	UsageHours	8.00	2.90
tbloffRoadEquipment	UsageHours	8.00	4.08
tbloffRoadEquipment	UsageHours	8.00	3.71
tbloffRoadEquipment	UsageHours	8.00	3.96
tbloffRoadEquipment	UsageHours	8.00	3.96
tbloffRoadEquipment	UsageHours	8.00	8.84
tbloffRoadEquipment	UsageHours	8.00	4.04
tbloffRoadEquipment	UsageHours	8.00	4.12
tbloffRoadEquipment	UsageHours	8.00	4.04
tbloffRoadEquipment	UsageHours	8.00	4.04

tblOffRoadEquipment	UsageHours	8.00	3.96
tblOffRoadEquipment	UsageHours	8.00	3.96
tblOffRoadEquipment	UsageHours	8.00	4.04
tblOffRoadEquipment	UsageHours	8.00	4.04
tblOffRoadEquipment	UsageHours	8.00	4.04
tblOffRoadEquipment	UsageHours	8.00	4.04
tblOffRoadEquipment	UsageHours	8.00	2.31
tblOffRoadEquipment	UsageHours	8.00	3.96
tblOffRoadEquipment	UsageHours	8.00	4.04
tblOffRoadEquipment	UsageHours	8.00	2.31
tblOffRoadEquipment	UsageHours	8.00	2.31
tblOffRoadEquipment	UsageHours	8.00	8.66
tblOffRoadEquipment	UsageHours	8.00	2.26
tblOffRoadEquipment	UsageHours	8.00	3.45
tblOffRoadEquipment	UsageHours	8.00	3.46
tblProjectCharacteristics	OperationalYear	2014	2035
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.2278	2.5129	1.1757	4.9800e-003	0.0000	0.0794	0.0794	0.0000	0.0778	0.0778	0.0000	503.7781	503.7781	0.0365	0.0000	504.5453

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	3.3885	35.5766	18.1200	0.0796	0.0000	1.1138	1.1138	0.0000	1.0932	1.0932	0.0000	8,041.0267	8,041.0267	0.5520	0.0000	8,052.6176
2021	0.0699	0.6463	0.4129	1.8600e-003	0.0000	0.0207	0.0207	0.0000	0.0203	0.0203	0.0000	187.2519	187.2519	0.0123	0.0000	187.5107
2022	0.0706	0.6077	0.4339	1.9900e-003	0.0000	0.0198	0.0198	0.0000	0.0194	0.0194	0.0000	200.5238	200.5238	0.0134	0.0000	200.8045
2023	0.0674	0.5439	0.4300	1.9900e-003	0.0000	0.0174	0.0174	0.0000	0.0170	0.0170	0.0000	200.5342	200.5342	0.0131	0.0000	200.8085
2024	2.7029	20.4274	18.0511	0.0845	0.0000	0.6432	0.6432	0.0000	0.6291	0.6291	0.0000	8,515.7605	8,515.7605	0.5223	0.0000	8,526.7288
2025	0.1135	0.7954	0.7897	3.7200e-003	0.0000	0.0245	0.0245	0.0000	0.0239	0.0239	0.0000	374.6104	374.6104	0.0229	0.0000	375.0915
2026	0.4338	3.0420	3.0191	0.0142	0.0000	0.0936	0.0936	0.0000	0.0914	0.0914	0.0000	1,431.4607	1,431.4607	0.0879	0.0000	1,433.3055
2027	0.1747	1.2254	1.2152	5.7100e-003	0.0000	0.0378	0.0378	0.0000	0.0369	0.0369	0.0000	575.1511	575.1511	0.0357	0.0000	575.9000
2028	0.1486	1.0427	1.0331	4.8500e-003	0.0000	0.0323	0.0323	0.0000	0.0315	0.0315	0.0000	488.1163	488.1163	0.0306	0.0000	488.7585
2029	0.3986	2.7948	2.7732	0.0131	0.0000	0.0861	0.0861	0.0000	0.0841	0.0841	0.0000	1,314.3448	1,314.3448	0.0809	0.0000	1,316.0427
2030	0.5167	1.9830	4.1192	0.0205	0.0000	0.0616	0.0616	0.0000	0.0616	0.0616	0.0000	2,104.2523	2,104.2523	0.0395	0.0000	2,105.0816
2031	0.3528	1.3535	2.8117	0.0140	0.0000	0.0421	0.0421	0.0000	0.0421	0.0421	0.0000	1,436.0790	1,436.0790	0.0270	0.0000	1,436.6452
2032	0.3857	1.4796	3.0738	0.0153	0.0000	0.0460	0.0460	0.0000	0.0460	0.0460	0.0000	1,569.8027	1,569.8027	0.0295	0.0000	1,570.4218
2033	0.1266	0.4847	1.0071	5.0000e-003	0.0000	0.0151	0.0151	0.0000	0.0151	0.0151	0.0000	513.6884	513.6884	9.6800e-003	0.0000	513.8916
2034	0.4364	1.6737	3.4770	0.0173	0.0000	0.0520	0.0520	0.0000	0.0520	0.0520	0.0000	1,775.5315	1,775.5315	0.0334	0.0000	1,776.2320
2035	0.8772	2.5474	7.5250	0.0375	0.0000	0.0830	0.0830	0.0000	0.0830	0.0830	0.0000	3,852.2392	3,852.2392	0.0662	0.0000	3,853.6295
2036	0.1648	0.4789	1.4110	7.0100e-003	0.0000	0.0155	0.0155	0.0000	0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120
2037	0.1648	0.4789	1.4110	7.0100e-003	0.0000	0.0155	0.0155	0.0000	0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2038	0.1648	0.4789	1.4110	7.0100e-003	0.0000	0.0155	0.0155	0.0000	0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120
2039	0.1648	0.4789	1.4110	7.0100e-003	0.0000	0.0155	0.0155	0.0000	0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120
2040	0.1595	0.4118	1.4108	7.0100e-003	0.0000	0.0129	0.0129	0.0000	0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
2041	0.1595	0.4118	1.4108	7.0100e-003	0.0000	0.0129	0.0129	0.0000	0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
2042	0.1595	0.4118	1.4108	7.0100e-003	0.0000	0.0129	0.0129	0.0000	0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
2043	0.1595	0.4118	1.4108	7.0100e-003	0.0000	0.0129	0.0129	0.0000	0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
2044	0.1595	0.4118	1.4108	7.0100e-003	0.0000	0.0129	0.0129	0.0000	0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
2045	0.1595	0.4118	1.4108	7.0100e-003	0.0000	0.0129	0.0129	0.0000	0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
2046	0.1595	0.4118	1.4108	7.0100e-003	0.0000	0.0129	0.0129	0.0000	0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
2047	0.1595	0.4118	1.4108	7.0100e-003	0.0000	0.0129	0.0129	0.0000	0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
2048	0.1595	0.4118	1.4108	7.0100e-003	0.0000	0.0129	0.0129	0.0000	0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
2049	0.1595	0.4118	1.4108	7.0100e-003	0.0000	0.0129	0.0129	0.0000	0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
Total	12.7460	84.7705	89.2198	0.4241	0.0000	2.6594	2.6594	0.0000	2.6153	2.6153	0.0000	43,164.86 98	43,164.86 98	1.7867	0.0000	43,202.39 04

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0602	0.2717	2.2072	4.9800e-003	0.0000	7.9800e-003	7.9800e-003	0.0000	7.9800e-003	7.9800e-003	0.0000	503.7775	503.7775	0.0365	0.0000	504.5447
2019	0.9608	4.3367	35.2637	0.0796	0.0000	0.1275	0.1275	0.0000	0.1275	0.1275	0.0000	8,041.0171	8,041.0171	0.5520	0.0000	8,052.6080
2021	0.0224	0.1011	0.8233	1.8600e-003	0.0000	2.9800e-003	2.9800e-003	0.0000	2.9800e-003	2.9800e-003	0.0000	187.2517	187.2517	0.0123	0.0000	187.5105
2022	0.0241	0.1087	0.8829	1.9900e-003	0.0000	3.1900e-003	3.1900e-003	0.0000	3.1900e-003	3.1900e-003	0.0000	200.5235	200.5235	0.0134	0.0000	200.8043
2023	0.0241	0.1087	0.8829	1.9900e-003	0.0000	3.1900e-003	3.1900e-003	0.0000	3.1900e-003	3.1900e-003	0.0000	200.5339	200.5339	0.0131	0.0000	200.8082
2024	1.0200	4.5965	37.4308	0.0845	0.0000	0.1354	0.1354	0.0000	0.1354	0.1354	0.0000	8,515.7503	8,515.7503	0.5223	0.0000	8,526.7187
2025	0.0449	0.2022	1.6465	3.7200e-003	0.0000	5.9500e-003	5.9500e-003	0.0000	5.9500e-003	5.9500e-003	0.0000	374.6099	374.6099	0.0229	0.0000	375.0911
2026	0.1715	0.7728	6.2926	0.0142	0.0000	0.0228	0.0228	0.0000	0.0228	0.0228	0.0000	1,431.4590	1,431.4590	0.0879	0.0000	1,433.3038
2027	0.0689	0.3108	2.5294	5.7100e-003	0.0000	9.1500e-003	9.1500e-003	0.0000	9.1500e-003	9.1500e-003	0.0000	575.1504	575.1504	0.0357	0.0000	575.8993
2028	0.0585	0.2641	2.1476	4.8500e-003	0.0000	7.7700e-003	7.7700e-003	0.0000	7.7700e-003	7.7700e-003	0.0000	488.1157	488.1157	0.0306	0.0000	488.7579
2029	0.1575	0.7097	5.7783	0.0131	0.0000	0.0209	0.0209	0.0000	0.0209	0.0209	0.0000	1,314.3432	1,314.3432	0.0809	0.0000	1,316.0411
2030	0.2461	1.1097	9.0295	0.0205	0.0000	0.0327	0.0327	0.0000	0.0327	0.0327	0.0000	2,104.2498	2,104.2498	0.0395	0.0000	2,105.0791
2031	0.1679	0.7575	6.1624	0.0140	0.0000	0.0223	0.0223	0.0000	0.0223	0.0223	0.0000	1,436.0773	1,436.0773	0.0270	0.0000	1,436.6435
2032	0.1836	0.8282	6.7363	0.0153	0.0000	0.0244	0.0244	0.0000	0.0244	0.0244	0.0000	1,569.8009	1,569.8009	0.0295	0.0000	1,570.4200
2033	0.0601	0.2714	2.2047	5.0000e-003	0.0000	7.9700e-003	7.9700e-003	0.0000	7.9700e-003	7.9700e-003	0.0000	513.6878	513.6878	9.6800e-003	0.0000	513.8910
2034	0.2076	0.9369	7.6192	0.0173	0.0000	0.0276	0.0276	0.0000	0.0276	0.0276	0.0000	1,775.5294	1,775.5294	0.0334	0.0000	1,776.2298
2035	0.4503	2.0242	16.5224	0.0375	0.0000	0.0598	0.0598	0.0000	0.0598	0.0598	0.0000	3,852.2347	3,852.2347	0.0662	0.0000	3,853.6249
2036	0.0842	0.3804	3.0901	7.0100e-003	0.0000	0.0112	0.0112	0.0000	0.0112	0.0112	0.0000	720.0497	720.0497	0.0125	0.0000	720.3111

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Year -2	Building Construction	9/1/2018	10/31/2018	6	52	
2	Year -1	Building Construction	1/1/2019	12/31/2019	6	313	
3	Year 2	Building Construction	10/1/2021	10/30/2021	6	26	

4	Year 3	Building Construction	10/1/2022	10/31/2022	6	26
5	Year 4	Building Construction	10/1/2023	10/31/2023	6	26
6	Year 5	Building Construction	1/1/2024	12/31/2024	6	314
7	Year 6	Building Construction	9/1/2025	10/31/2025	6	53
8	Year 7	Building Construction	6/1/2026	10/31/2026	6	132
9	Year 8	Building Construction	9/1/2027	10/30/2027	6	52
10	Year 9	Building Construction	9/1/2028	10/31/2028	6	52
11	Year 10	Building Construction	7/1/2029	10/31/2029	6	105
12	Year 11	Building Construction	5/1/2030	10/31/2030	6	158
13	Year 12	Building Construction	7/1/2031	10/31/2031	6	106
14	Year 13	Building Construction	6/1/2032	10/29/2032	6	130
15	Year 14	Building Construction	9/1/2033	10/31/2033	6	52
16	Year 15	Building Construction	6/1/2034	10/31/2034	6	131
17	Year 16	Building Construction	1/1/2035	11/30/2035	6	287
18	Year 17	Building Construction	9/1/2036	10/31/2036	6	53
19	Year 18	Building Construction	9/1/2037	10/31/2037	6	53
20	Year 19	Building Construction	9/1/2038	10/30/2038	6	52
21	Year 20	Building Construction	9/1/2039	10/29/2039	6	51
22	Year 21	Building Construction	9/1/2040	10/31/2040	6	52
23	Year 22	Building Construction	9/1/2041	10/31/2041	6	52
24	Year 23	Building Construction	9/1/2042	10/31/2042	6	53
25	Year 24	Building Construction	9/1/2043	10/31/2043	6	53
26	Year 25	Building Construction	9/1/2044	10/31/2044	6	52
27	Year 26	Building Construction	9/1/2045	10/31/2045	6	52
28	Year 27	Building Construction	9/1/2046	10/31/2046	6	52
29	Year 28	Building Construction	9/1/2047	10/31/2047	6	52
30	Year 29	Building Construction	9/1/2048	10/31/2048	6	53
31	Year 30	Building Construction	9/1/2049	10/31/2049	6	52

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Year -2	Tractors/Loaders/Backhoes	1	0.96	100	0.37
Year -2	Other Construction Equipment	1	1.92	210	0.42
Year -2	Other Construction Equipment	1	0.96	210	0.42
Year -2	Other Construction Equipment	1	1.92	180	0.42
Year -2	Cranes	1	2.88	38	0.29
Year -2	Welders	1	2.88	42	0.45
Year -2	Cranes	1	0.96	240	0.29
Year -2	Other Construction Equipment	1	2.88	475	0.42
Year -2	Other Construction Equipment	1	2.88	180	0.42
Year -2	Generator Sets	1	19.62	600	0.74
Year -2	Generator Sets	1	14.54	550	0.74
Year -2	Other Construction Equipment	1	10.81	385	0.42
Year -2	Other Construction Equipment	1	1.73	630	0.42
Year -2	Other Construction Equipment	1	1.73	365	0.42
Year -2	Other Construction Equipment	1	1.73	245	0.42
Year -2	Other Construction Equipment	1	6.92	210	0.42
Year -1	Tractors/Loaders/Backhoes	1	2.95	100	0.37
Year -1	Other Construction Equipment	1	4.10	210	0.42
Year -1	Other Construction Equipment	1	6.52	210	0.42
Year -1	Other Construction Equipment	1	9.47	180	0.42

Year -1	Cranes	1	5.26	38	0.29
Year -1	Welders	1	8.84	42	0.45
Year -1	Cranes	1	1.16	240	0.29
Year -1	Other Construction Equipment	1	3.47	475	0.42
Year -1	Other Construction Equipment	1	3.47	180	0.42
Year -1	Generator Sets	3	17.51	600	0.74
Year -1	Generator Sets	2	19.56	550	0.74
Year -1	Other Construction Equipment	2	15.66	385	0.42
Year -1	Other Construction Equipment	1	5.01	630	0.42
Year -1	Other Construction Equipment	1	5.01	365	0.42
Year -1	Other Construction Equipment	1	5.01	245	0.42
Year -1	Other Construction Equipment	1	20.06	210	0.42
Year 2	Tractors/Loaders/Backhoes	1	0.77	100	0.37
Year 2	Other Construction Equipment	1	1.15	210	0.42
Year 2	Other Construction Equipment	1	1.54	210	0.42
Year 2	Other Construction Equipment	1	2.31	180	0.42
Year 2	Cranes	1	1.54	38	0.29
Year 2	Welders	1	2.31	42	0.45
Year 2	Cranes	1	0.38	240	0.29
Year 2	Other Construction Equipment	1	1.15	475	0.42
Year 2	Other Construction Equipment	1	1.15	180	0.42
Year 2	Generator Sets	1	14.77	600	0.74
Year 2	Generator Sets	1	10.98	550	0.74
Year 2	Other Construction Equipment	1	8.65	385	0.42
Year 2	Other Construction Equipment	1	1.38	630	0.42
Year 2	Other Construction Equipment	1	1.38	365	0.42
Year 2	Other Construction Equipment	1	1.38	245	0.42
Year 2	Other Construction Equipment	1	5.54	210	0.42

Year 3	Tractors/Loaders/Backhoes	1	0.77	100	0.37
Year 3	Other Construction Equipment	1	1.54	210	0.42
Year 3	Other Construction Equipment	1	0.77	210	0.42
Year 3	Other Construction Equipment	1	1.54	180	0.42
Year 3	Cranes	1	2.31	38	0.29
Year 3	Welders	1	2.31	42	0.45
Year 3	Cranes	1	0.77	240	0.29
Year 3	Other Construction Equipment	1	2.31	475	0.42
Year 3	Other Construction Equipment	1	2.31	180	0.42
Year 3	Generator Sets	1	15.69	600	0.74
Year 3	Generator Sets	1	11.63	550	0.74
Year 3	Other Construction Equipment	1	8.65	385	0.42
Year 3	Other Construction Equipment	1	1.38	630	0.42
Year 3	Other Construction Equipment	1	1.38	365	0.42
Year 3	Other Construction Equipment	1	1.38	245	0.42
Year 3	Other Construction Equipment	1	5.54	210	0.42
Year 4	Tractors/Loaders/Backhoes	1	0.77	100	0.37
Year 4	Other Construction Equipment	1	1.54	210	0.42
Year 4	Other Construction Equipment	1	0.77	210	0.42
Year 4	Other Construction Equipment	1	1.54	180	0.42
Year 4	Cranes	1	2.31	38	0.29
Year 4	Welders	1	2.31	42	0.45
Year 4	Cranes	1	0.77	240	0.29
Year 4	Other Construction Equipment	1	2.31	475	0.42
Year 4	Other Construction Equipment	1	2.31	180	0.42
Year 4	Generator Sets	1	15.69	600	0.74
Year 4	Generator Sets	1	11.63	550	0.74
Year 4	Other Construction Equipment	1	8.65	385	0.42

Year 4	Other Construction Equipment	1	1.38	630	0.42
Year 4	Other Construction Equipment	1	1.38	365	0.42
Year 4	Other Construction Equipment	1	1.38	245	0.42
Year 4	Other Construction Equipment	1	5.54	210	0.42
Year 5	Tractors/Loaders/Backhoes	1	2.89	100	0.37
Year 5	Other Construction Equipment	1	4.40	210	0.42
Year 5	Other Construction Equipment	1	5.62	210	0.42
Year 5	Other Construction Equipment	1	8.51	180	0.42
Year 5	Cranes	1	5.92	38	0.29
Year 5	Welders	1	8.66	42	0.45
Year 5	Cranes	1	1.52	240	0.29
Year 5	Other Construction Equipment	1	4.55	475	0.42
Year 5	Other Construction Equipment	1	4.55	180	0.42
Year 5	Generator Sets	3	18.52	600	0.74
Year 5	Generator Sets	2	20.66	550	0.74
Year 5	Other Construction Equipment	2	16.22	385	0.42
Year 5	Other Construction Equipment	1	5.19	630	0.42
Year 5	Other Construction Equipment	1	5.19	365	0.42
Year 5	Other Construction Equipment	1	5.19	245	0.42
Year 5	Other Construction Equipment	1	20.77	210	0.42
Year 6	Tractors/Loaders/Backhoes	1	0.75	100	0.37
Year 6	Other Construction Equipment	1	1.13	210	0.42
Year 6	Other Construction Equipment	1	1.51	210	0.42
Year 6	Other Construction Equipment	1	2.26	180	0.42
Year 6	Cranes	1	1.51	38	0.29
Year 6	Welders	1	2.26	42	0.45
Year 6	Cranes	1	0.38	240	0.29
Year 6	Other Construction Equipment	1	1.13	475	0.42

Year 6	Other Construction Equipment	1	1.13	180	0.42
Year 6	Generator Sets	1	14.49	600	0.74
Year 6	Generator Sets	1	10.78	550	0.74
Year 6	Other Construction Equipment	1	8.49	385	0.42
Year 6	Other Construction Equipment	1	1.36	630	0.42
Year 6	Other Construction Equipment	1	1.36	365	0.42
Year 6	Other Construction Equipment	1	1.36	245	0.42
Year 6	Other Construction Equipment	1	5.43	210	0.42
Year 7	Tractors/Loaders/Backhoes	1	1.15	100	0.37
Year 7	Other Construction Equipment	1	1.77	210	0.42
Year 7	Other Construction Equipment	1	2.21	210	0.42
Year 7	Other Construction Equipment	1	3.36	180	0.42
Year 7	Cranes	1	2.39	38	0.29
Year 7	Welders	1	3.45	42	0.45
Year 7	Cranes	1	0.62	240	0.29
Year 7	Other Construction Equipment	1	1.86	475	0.42
Year 7	Other Construction Equipment	1	1.86	180	0.42
Year 7	Generator Sets	1	22.22	600	0.74
Year 7	Generator Sets	1	16.52	550	0.74
Year 7	Other Construction Equipment	1	12.95	385	0.42
Year 7	Other Construction Equipment	1	2.07	630	0.42
Year 7	Other Construction Equipment	1	2.07	365	0.42
Year 7	Other Construction Equipment	1	2.07	245	0.42
Year 7	Other Construction Equipment	1	8.29	210	0.42
Year 8	Tractors/Loaders/Backhoes	1	1.15	100	0.37
Year 8	Other Construction Equipment	1	1.92	210	0.42
Year 8	Other Construction Equipment	1	1.92	210	0.42
Year 8	Other Construction Equipment	1	3.08	180	0.42

Year 8	Cranes	1	2.69	38	0.29
Year 8	Welders	1	3.46	42	0.45
Year 8	Cranes	1	0.77	240	0.29
Year 8	Other Construction Equipment	1	2.31	475	0.42
Year 8	Other Construction Equipment	1	2.31	180	0.42
Year 8	Generator Sets	1	22.62	600	0.74
Year 8	Generator Sets	1	16.80	550	0.74
Year 8	Other Construction Equipment	1	12.97	385	0.42
Year 8	Other Construction Equipment	1	2.08	630	0.42
Year 8	Other Construction Equipment	1	2.08	365	0.42
Year 8	Other Construction Equipment	1	2.08	245	0.42
Year 8	Other Construction Equipment	1	8.31	210	0.42
Year 9	Tractors/Loaders/Backhoes	1	0.96	100	0.37
Year 9	Other Construction Equipment	1	1.73	210	0.42
Year 9	Other Construction Equipment	1	1.35	210	0.42
Year 9	Other Construction Equipment	1	2.31	180	0.42
Year 9	Cranes	1	2.50	38	0.29
Year 9	Welders	1	2.88	42	0.45
Year 9	Cranes	1	0.77	240	0.29
Year 9	Other Construction Equipment	1	2.31	475	0.42
Year 9	Other Construction Equipment	1	2.31	180	0.42
Year 9	Generator Sets	1	19.15	600	0.74
Year 9	Generator Sets	1	14.22	550	0.74
Year 9	Other Construction Equipment	1	10.81	385	0.42
Year 9	Other Construction Equipment	1	1.73	630	0.42
Year 9	Other Construction Equipment	1	1.73	365	0.42
Year 9	Other Construction Equipment	1	1.73	245	0.42
Year 9	Other Construction Equipment	1	6.92	210	0.42

Year 10	Tractors/Loaders/Backhoes	1	1.32	100	0.37
Year 10	Other Construction Equipment	1	2.08	210	0.42
Year 10	Other Construction Equipment	1	2.47	210	0.42
Year 10	Other Construction Equipment	1	3.79	180	0.42
Year 10	Cranes	1	2.83	38	0.29
Year 10	Welders	1	3.97	42	0.45
Year 10	Cranes	1	0.75	240	0.29
Year 10	Other Construction Equipment	1	2.26	475	0.42
Year 10	Other Construction Equipment	1	2.26	180	0.42
Year 10	Generator Sets	2	12.82	600	0.74
Year 10	Generator Sets	1	19.06	550	0.74
Year 10	Other Construction Equipment	1	14.88	385	0.42
Year 10	Other Construction Equipment	1	2.38	630	0.42
Year 10	Other Construction Equipment	1	2.38	365	0.42
Year 10	Other Construction Equipment	1	2.38	245	0.42
Year 10	Other Construction Equipment	1	9.53	210	0.42
Year 11	Tractors/Loaders/Backhoes	1	1.35	100	0.37
Year 11	Other Construction Equipment	1	2.27	210	0.42
Year 11	Other Construction Equipment	1	2.24	210	0.42
Year 11	Other Construction Equipment	1	3.59	180	0.42
Year 11	Cranes	1	3.18	38	0.29
Year 11	Welders	1	4.06	42	0.45
Year 11	Cranes	1	0.91	240	0.29
Year 11	Other Construction Equipment	1	2.73	475	0.42
Year 11	Other Construction Equipment	1	2.73	180	0.42
Year 11	Generator Sets	2	13.28	600	0.74
Year 11	Generator Sets	1	19.73	550	0.74
Year 11	Other Construction Equipment	1	15.23	385	0.42

Year 11	Other Construction Equipment	1	2.44	630	0.42
Year 11	Other Construction Equipment	1	2.44	365	0.42
Year 11	Other Construction Equipment	1	2.44	245	0.42
Year 11	Other Construction Equipment	1	9.75	210	0.42
Year 12	Tractors/Loaders/Backhoes	1	1.37	100	0.37
Year 12	Other Construction Equipment	1	2.36	210	0.42
Year 12	Other Construction Equipment	1	2.12	210	0.42
Year 12	Other Construction Equipment	1	3.49	180	0.42
Year 12	Cranes	1	3.35	38	0.29
Year 12	Welders	1	4.10	42	0.45
Year 12	Cranes	1	0.99	240	0.29
Year 12	Other Construction Equipment	1	2.97	475	0.42
Year 12	Other Construction Equipment	1	2.97	180	0.42
Year 12	Generator Sets	2	13.50	600	0.74
Year 12	Generator Sets	1	20.05	550	0.74
Year 12	Other Construction Equipment	1	15.38	385	0.42
Year 12	Other Construction Equipment	1	2.46	630	0.42
Year 12	Other Construction Equipment	1	2.46	365	0.42
Year 12	Other Construction Equipment	1	2.46	245	0.42
Year 12	Other Construction Equipment	1	9.85	210	0.42
Year 13	Tractors/Loaders/Backhoes	1	1.22	100	0.37
Year 13	Other Construction Equipment	1	2.12	210	0.42
Year 13	Other Construction Equipment	1	1.83	210	0.42
Year 13	Other Construction Equipment	1	3.05	180	0.42
Year 13	Cranes	1	3.03	38	0.29
Year 13	Welders	1	3.65	42	0.45
Year 13	Cranes	1	0.91	240	0.29
Year 13	Other Construction Equipment	1	2.72	475	0.42

Year 13	Other Construction Equipment	1	2.72	180	0.42
Year 13	Generator Sets	2	12.03	600	0.74
Year 13	Generator Sets	1	17.86	550	0.74
Year 13	Other Construction Equipment	1	13.67	385	0.42
Year 13	Other Construction Equipment	1	2.19	630	0.42
Year 13	Other Construction Equipment	1	2.19	365	0.42
Year 13	Other Construction Equipment	1	2.19	245	0.42
Year 13	Other Construction Equipment	1	8.75	210	0.42
Year 14	Tractors/Loaders/Backhoes	1	1.00	100	0.37
Year 14	Other Construction Equipment	1	1.90	210	0.42
Year 14	Other Construction Equipment	1	1.00	210	0.42
Year 14	Other Construction Equipment	1	1.90	180	0.42
Year 14	Cranes	1	2.90	38	0.29
Year 14	Welders	1	2.90	42	0.45
Year 14	Cranes	1	1.00	240	0.29
Year 14	Other Construction Equipment	1	2.90	475	0.42
Year 14	Other Construction Equipment	1	2.90	180	0.42
Year 14	Generator Sets	1	19.60	600	0.74
Year 14	Generator Sets	1	14.50	550	0.74
Year 14	Other Construction Equipment	1	10.80	385	0.42
Year 14	Other Construction Equipment	1	1.70	630	0.42
Year 14	Other Construction Equipment	1	1.70	365	0.42
Year 14	Other Construction Equipment	1	1.70	245	0.42
Year 14	Other Construction Equipment	1	6.90	210	0.42
Year 15	Tractors/Loaders/Backhoes	1	1.36	100	0.37
Year 15	Other Construction Equipment	1	2.41	210	0.42
Year 15	Other Construction Equipment	1	1.97	210	0.42
Year 15	Other Construction Equipment	1	3.33	180	0.42

Year 15	Cranes	1	3.47	38	0.29
Year 15	Welders	1	4.08	42	0.45
Year 15	Cranes	1	1.05	240	0.29
Year 15	Other Construction Equipment	1	3.16	475	0.42
Year 15	Other Construction Equipment	1	3.16	180	0.42
Year 15	Generator Sets	2	13.49	600	0.74
Year 15	Generator Sets	1	20.03	550	0.74
Year 15	Other Construction Equipment	1	15.28	385	0.42
Year 15	Other Construction Equipment	1	2.45	630	0.42
Year 15	Other Construction Equipment	1	2.45	365	0.42
Year 15	Other Construction Equipment	1	2.45	245	0.42
Year 15	Other Construction Equipment	1	9.78	210	0.42
Year 16	Tractors/Loaders/Backhoes	1	1.24	100	0.37
Year 16	Other Construction Equipment	1	2.13	210	0.42
Year 16	Other Construction Equipment	1	1.93	210	0.42
Year 16	Other Construction Equipment	1	3.17	180	0.42
Year 16	Cranes	1	3.01	38	0.29
Year 16	Welders	1	3.71	42	0.45
Year 16	Cranes	1	0.89	240	0.29
Year 16	Other Construction Equipment	1	2.67	475	0.42
Year 16	Other Construction Equipment	1	2.67	180	0.42
Year 16	Generator Sets	2	13.42	600	0.74
Year 16	Generator Sets	1	19.93	550	0.74
Year 16	Other Construction Equipment	1	15.30	385	0.42
Year 16	Other Construction Equipment	1	2.45	630	0.42
Year 16	Other Construction Equipment	1	2.45	365	0.42
Year 16	Other Construction Equipment	1	2.45	245	0.42
Year 16	Other Construction Equipment	1	9.80	210	0.42

Year 17	Tractors/Loaders/Backhoes	1	1.32	100	0.37
Year 17	Other Construction Equipment	1	2.64	210	0.42
Year 17	Other Construction Equipment	1	1.32	210	0.42
Year 17	Other Construction Equipment	1	2.64	180	0.42
Year 17	Cranes	1	3.96	38	0.29
Year 17	Welders	1	3.96	42	0.45
Year 17	Cranes	1	1.32	240	0.29
Year 17	Other Construction Equipment	1	3.96	475	0.42
Year 17	Other Construction Equipment	1	3.96	180	0.42
Year 17	Generator Sets	2	13.47	600	0.74
Year 17	Generator Sets	1	19.97	550	0.74
Year 17	Other Construction Equipment	1	14.85	385	0.42
Year 17	Other Construction Equipment	1	2.38	630	0.42
Year 17	Other Construction Equipment	1	2.38	365	0.42
Year 17	Other Construction Equipment	1	2.38	245	0.42
Year 17	Other Construction Equipment	1	9.51	210	0.42
Year 18	Tractors/Loaders/Backhoes	1	1.32	100	0.37
Year 18	Other Construction Equipment	1	2.64	210	0.42
Year 18	Other Construction Equipment	1	1.32	210	0.42
Year 18	Other Construction Equipment	1	2.64	180	0.42
Year 18	Cranes	1	3.96	38	0.29
Year 18	Welders	1	3.96	42	0.45
Year 18	Cranes	1	1.32	240	0.29
Year 18	Other Construction Equipment	1	3.96	475	0.42
Year 18	Other Construction Equipment	1	3.96	180	0.42
Year 18	Generator Sets	2	13.47	600	0.74
Year 18	Generator Sets	1	19.97	550	0.74
Year 18	Other Construction Equipment	1	14.85	385	0.42

Year 18	Other Construction Equipment	1	2.38	630	0.42
Year 18	Other Construction Equipment	1	2.38	365	0.42
Year 18	Other Construction Equipment	1	2.38	245	0.42
Year 18	Other Construction Equipment	1	9.51	210	0.42
Year 19	Tractors/Loaders/Backhoes	1	1.35	100	0.37
Year 19	Other Construction Equipment	1	2.69	210	0.42
Year 19	Other Construction Equipment	1	1.35	210	0.42
Year 19	Other Construction Equipment	1	2.69	180	0.42
Year 19	Cranes	1	4.04	38	0.29
Year 19	Welders	1	4.04	42	0.45
Year 19	Cranes	1	1.35	240	0.29
Year 19	Other Construction Equipment	1	4.04	475	0.42
Year 19	Other Construction Equipment	1	4.04	180	0.42
Year 19	Generator Sets	2	13.73	600	0.74
Year 19	Generator Sets	1	20.35	550	0.74
Year 19	Other Construction Equipment	1	15.14	385	0.42
Year 19	Other Construction Equipment	1	2.42	630	0.42
Year 19	Other Construction Equipment	1	2.42	365	0.42
Year 19	Other Construction Equipment	1	2.42	245	0.42
Year 19	Other Construction Equipment	1	9.69	210	0.42
Year 20	Tractors/Loaders/Backhoes	1	1.37	100	0.37
Year 20	Other Construction Equipment	1	2.75	210	0.42
Year 20	Other Construction Equipment	1	1.37	210	0.42
Year 20	Other Construction Equipment	1	2.75	180	0.42
Year 20	Cranes	1	4.12	38	0.29
Year 20	Welders	1	4.12	42	0.45
Year 20	Cranes	1	1.37	240	0.29
Year 20	Other Construction Equipment	1	4.12	475	0.42

Year 20	Other Construction Equipment	1	4.12	180	0.42
Year 20	Generator Sets	2	14.00	600	0.74
Year 20	Generator Sets	1	20.75	550	0.74
Year 20	Other Construction Equipment	1	15.43	385	0.42
Year 20	Other Construction Equipment	1	2.47	630	0.42
Year 20	Other Construction Equipment	1	2.47	365	0.42
Year 20	Other Construction Equipment	1	2.47	245	0.42
Year 20	Other Construction Equipment	1	9.88	210	0.42
Year 21	Tractors/Loaders/Backhoes	1	1.35	100	0.37
Year 21	Other Construction Equipment	1	2.69	210	0.42
Year 21	Other Construction Equipment	1	1.35	210	0.42
Year 21	Other Construction Equipment	1	2.69	180	0.42
Year 21	Cranes	1	4.04	38	0.29
Year 21	Welders	1	4.04	42	0.45
Year 21	Cranes	1	1.35	240	0.29
Year 21	Other Construction Equipment	1	4.04	475	0.42
Year 21	Other Construction Equipment	1	4.04	180	0.42
Year 21	Generator Sets	2	13.73	600	0.74
Year 21	Generator Sets	1	20.35	550	0.74
Year 21	Other Construction Equipment	1	15.14	385	0.42
Year 21	Other Construction Equipment	1	2.42	630	0.42
Year 21	Other Construction Equipment	1	2.42	365	0.42
Year 21	Other Construction Equipment	1	2.42	245	0.42
Year 21	Other Construction Equipment	1	9.69	210	0.42
Year 22	Tractors/Loaders/Backhoes	1	1.35	100	0.37
Year 22	Other Construction Equipment	1	2.69	210	0.42
Year 22	Other Construction Equipment	1	1.35	210	0.42
Year 22	Other Construction Equipment	1	2.69	180	0.42

Year 22	Cranes	1	4.04	38	0.29
Year 22	Welders	1	4.04	42	0.45
Year 22	Cranes	1	1.35	240	0.29
Year 22	Other Construction Equipment	1	4.04	475	0.42
Year 22	Other Construction Equipment	1	4.04	180	0.42
Year 22	Generator Sets	2	13.73	600	0.74
Year 22	Generator Sets	1	20.35	550	0.74
Year 22	Other Construction Equipment	1	15.14	385	0.42
Year 22	Other Construction Equipment	1	2.42	630	0.42
Year 22	Other Construction Equipment	1	2.42	365	0.42
Year 22	Other Construction Equipment	1	2.42	245	0.42
Year 22	Other Construction Equipment	1	9.69	210	0.42
Year 23	Tractors/Loaders/Backhoes	1	1.32	100	0.37
Year 23	Other Construction Equipment	1	2.64	210	0.42
Year 23	Other Construction Equipment	1	1.32	210	0.42
Year 23	Other Construction Equipment	1	2.64	180	0.42
Year 23	Cranes	1	3.96	38	0.29
Year 23	Welders	1	3.96	42	0.45
Year 23	Cranes	1	1.32	240	0.29
Year 23	Other Construction Equipment	1	3.96	475	0.42
Year 23	Other Construction Equipment	1	3.96	180	0.42
Year 23	Generator Sets	2	13.47	600	0.74
Year 23	Generator Sets	1	19.97	550	0.74
Year 23	Other Construction Equipment	1	14.85	385	0.42
Year 23	Other Construction Equipment	1	2.38	630	0.42
Year 23	Other Construction Equipment	1	2.38	365	0.42
Year 23	Other Construction Equipment	1	2.38	245	0.42
Year 23	Other Construction Equipment	1	9.51	210	0.42

Year 24	Tractors/Loaders/Backhoes	1	1.32	100	0.37
Year 24	Other Construction Equipment	1	2.64	210	0.42
Year 24	Other Construction Equipment	1	1.32	210	0.42
Year 24	Other Construction Equipment	1	2.64	180	0.42
Year 24	Cranes	1	3.96	38	0.29
Year 24	Welders	1	3.96	42	0.45
Year 24	Cranes	1	1.32	240	0.29
Year 24	Other Construction Equipment	1	3.96	475	0.42
Year 24	Other Construction Equipment	1	3.96	180	0.42
Year 24	Generator Sets	2	13.47	600	0.74
Year 24	Generator Sets	1	19.97	550	0.74
Year 24	Other Construction Equipment	1	14.85	385	0.42
Year 24	Other Construction Equipment	1	2.38	630	0.42
Year 24	Other Construction Equipment	1	2.38	365	0.42
Year 24	Other Construction Equipment	1	2.38	245	0.42
Year 24	Other Construction Equipment	1	9.51	210	0.42
Year 25	Tractors/Loaders/Backhoes	1	1.35	100	0.37
Year 25	Other Construction Equipment	1	2.69	210	0.42
Year 25	Other Construction Equipment	1	1.35	210	0.42
Year 25	Other Construction Equipment	1	2.69	180	0.42
Year 25	Cranes	1	4.04	38	0.29
Year 25	Welders	1	4.04	42	0.45
Year 25	Cranes	1	1.35	240	0.29
Year 25	Other Construction Equipment	1	4.04	475	0.42
Year 25	Other Construction Equipment	1	4.04	180	0.42
Year 25	Generator Sets	2	13.73	600	0.74
Year 25	Generator Sets	1	20.35	550	0.74
Year 25	Other Construction Equipment	1	15.14	385	0.42

Year 25	Other Construction Equipment	1	2.42	630	0.42
Year 25	Other Construction Equipment	1	2.42	365	0.42
Year 25	Other Construction Equipment	1	2.42	245	0.42
Year 25	Other Construction Equipment	1	9.69	210	0.42
Year 26	Tractors/Loaders/Backhoes	1	1.35	100	0.37
Year 26	Other Construction Equipment	1	2.69	210	0.42
Year 26	Other Construction Equipment	1	1.35	210	0.42
Year 26	Other Construction Equipment	1	2.69	180	0.42
Year 26	Cranes	1	4.04	38	0.29
Year 26	Welders	1	4.04	42	0.45
Year 26	Cranes	1	1.35	240	0.29
Year 26	Other Construction Equipment	1	4.04	475	0.42
Year 26	Other Construction Equipment	1	4.04	180	0.42
Year 26	Generator Sets	2	13.73	600	0.74
Year 26	Generator Sets	1	20.35	550	0.74
Year 26	Other Construction Equipment	1	15.14	385	0.42
Year 26	Other Construction Equipment	1	2.42	630	0.42
Year 26	Other Construction Equipment	1	2.42	365	0.42
Year 26	Other Construction Equipment	1	2.42	245	0.42
Year 26	Other Construction Equipment	1	9.69	210	0.42
Year 27	Tractors/Loaders/Backhoes	1	1.35	100	0.37
Year 27	Other Construction Equipment	1	2.69	210	0.42
Year 27	Other Construction Equipment	1	1.35	210	0.42
Year 27	Other Construction Equipment	1	2.69	180	0.42
Year 27	Cranes	1	4.04	38	0.29
Year 27	Welders	1	4.04	42	0.45
Year 27	Cranes	1	1.35	240	0.29
Year 27	Other Construction Equipment	1	4.04	475	0.42

Year 27	Other Construction Equipment	1	4.04	180	0.42
Year 27	Generator Sets	2	13.73	600	0.74
Year 27	Generator Sets	1	20.35	550	0.74
Year 27	Other Construction Equipment	1	15.14	385	0.42
Year 27	Other Construction Equipment	1	2.42	630	0.42
Year 27	Other Construction Equipment	1	2.42	365	0.42
Year 27	Other Construction Equipment	1	2.42	245	0.42
Year 27	Other Construction Equipment	1	9.69	210	0.42
Year 28	Tractors/Loaders/Backhoes	1	1.35	100	0.37
Year 28	Other Construction Equipment	1	2.69	210	0.42
Year 28	Other Construction Equipment	1	1.35	210	0.42
Year 28	Other Construction Equipment	1	2.69	180	0.42
Year 28	Cranes	1	4.04	38	0.29
Year 28	Welders	1	4.04	42	0.45
Year 28	Cranes	1	1.35	240	0.29
Year 28	Other Construction Equipment	1	4.04	475	0.42
Year 28	Other Construction Equipment	1	4.04	180	0.42
Year 28	Generator Sets	2	13.73	600	0.74
Year 28	Generator Sets	1	20.35	550	0.74
Year 28	Other Construction Equipment	1	15.14	385	0.42
Year 28	Other Construction Equipment	1	2.42	630	0.42
Year 28	Other Construction Equipment	1	2.42	365	0.42
Year 28	Other Construction Equipment	1	2.42	245	0.42
Year 28	Other Construction Equipment	1	9.69	210	0.42
Year 29	Tractors/Loaders/Backhoes	1	1.32	100	0.37
Year 29	Other Construction Equipment	1	2.64	210	0.42
Year 29	Other Construction Equipment	1	1.32	210	0.42
Year 29	Other Construction Equipment	1	2.64	180	0.42

Year 29	Cranes	1	3.96	38	0.29
Year 29	Welders	1	3.96	42	0.45
Year 29	Cranes	1	1.32	240	0.29
Year 29	Other Construction Equipment	1	3.96	475	0.42
Year 29	Other Construction Equipment	1	3.96	180	0.42
Year 29	Generator Sets	2	13.47	600	0.74
Year 29	Generator Sets	1	19.97	550	0.74
Year 29	Other Construction Equipment	1	14.85	385	0.42
Year 29	Other Construction Equipment	1	2.38	630	0.42
Year 29	Other Construction Equipment	1	2.38	365	0.42
Year 29	Other Construction Equipment	1	2.38	245	0.42
Year 29	Other Construction Equipment	1	9.51	210	0.42
Year 30	Tractors/Loaders/Backhoes	1	1.35	100	0.37
Year 30	Other Construction Equipment	1	2.69	210	0.42
Year 30	Other Construction Equipment	1	1.35	210	0.42
Year 30	Other Construction Equipment	1	2.69	180	0.42
Year 30	Cranes	1	4.04	38	0.29
Year 30	Welders	1	4.04	42	0.45
Year 30	Cranes	1	1.35	240	0.29
Year 30	Other Construction Equipment	1	4.04	475	0.42
Year 30	Other Construction Equipment	1	4.04	180	0.42
Year 30	Generator Sets	2	13.73	600	0.74
Year 30	Generator Sets	1	20.35	550	0.74
Year 30	Other Construction Equipment	1	15.14	385	0.42
Year 30	Other Construction Equipment	1	2.42	630	0.42
Year 30	Other Construction Equipment	1	2.42	365	0.42
Year 30	Other Construction Equipment	1	2.42	245	0.42
Year 30	Other Construction Equipment	1	9.69	210	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Year -2	16	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year -1	20	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 2	16	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 3	16	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 4	16	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 5	20	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 6	16	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 7	16	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 8	16	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 9	16	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 10	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 11	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 12	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 13	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 14	16	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 15	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 16	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 17	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 18	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 19	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 20	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 21	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 22	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 23	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

Year 24	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 25	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 26	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 27	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 28	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 29	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Year 30	17	0.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment
 Clean Paved Roads

3.2 Year -2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2278	2.5129	1.1757	4.9800e-003		0.0794	0.0794		0.0778	0.0778	0.0000	503.7781	503.7781	0.0365	0.0000	504.5453
Total	0.2278	2.5129	1.1757	4.9800e-003		0.0794	0.0794		0.0778	0.0778	0.0000	503.7781	503.7781	0.0365	0.0000	504.5453

3.2 Year -2 - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0602	0.2717	2.2072	4.9800e-003		7.9800e-003	7.9800e-003		7.9800e-003	7.9800e-003	0.0000	503.7775	503.7775	0.0365	0.0000	504.5447
Total	0.0602	0.2717	2.2072	4.9800e-003		7.9800e-003	7.9800e-003		7.9800e-003	7.9800e-003	0.0000	503.7775	503.7775	0.0365	0.0000	504.5447

3.2 Year -2 - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.3 Year -1 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.3885	35.5766	18.1200	0.0796		1.1138	1.1138		1.0932	1.0932	0.0000	8,041.0267	8,041.0267	0.5520	0.0000	8,052.6176
Total	3.3885	35.5766	18.1200	0.0796		1.1138	1.1138		1.0932	1.0932	0.0000	8,041.0267	8,041.0267	0.5520	0.0000	8,052.6176

3.3 Year -1 - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.9608	4.3367	35.2637	0.0796		0.1275	0.1275		0.1275	0.1275	0.0000	8,041.017 1	8,041.017 1	0.5520	0.0000	8,052.608 0
Total	0.9608	4.3367	35.2637	0.0796		0.1275	0.1275		0.1275	0.1275	0.0000	8,041.017 1	8,041.017 1	0.5520	0.0000	8,052.608 0

3.3 Year -1 - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.4 Year 2 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0699	0.6463	0.4129	1.8600e-003		0.0207	0.0207		0.0203	0.0203	0.0000	187.2519	187.2519	0.0123	0.0000	187.5107
Total	0.0699	0.6463	0.4129	1.8600e-003		0.0207	0.0207		0.0203	0.0203	0.0000	187.2519	187.2519	0.0123	0.0000	187.5107

3.4 Year 2 - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0224	0.1011	0.8233	1.8600e-003		2.9800e-003	2.9800e-003		2.9800e-003	2.9800e-003	0.0000	187.2517	187.2517	0.0123	0.0000	187.5105
Total	0.0224	0.1011	0.8233	1.8600e-003		2.9800e-003	2.9800e-003		2.9800e-003	2.9800e-003	0.0000	187.2517	187.2517	0.0123	0.0000	187.5105

3.4 Year 2 - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.5 Year 3 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0706	0.6077	0.4339	1.9900e-003		0.0198	0.0198		0.0194	0.0194	0.0000	200.5238	200.5238	0.0134	0.0000	200.8045
Total	0.0706	0.6077	0.4339	1.9900e-003		0.0198	0.0198		0.0194	0.0194	0.0000	200.5238	200.5238	0.0134	0.0000	200.8045

3.5 Year 3 - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0241	0.1087	0.8829	1.9900e-003		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	200.5235	200.5235	0.0134	0.0000	200.8043
Total	0.0241	0.1087	0.8829	1.9900e-003		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	200.5235	200.5235	0.0134	0.0000	200.8043

3.5 Year 3 - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.6 Year 4 - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0674	0.5439	0.4300	1.9900e-003		0.0174	0.0174		0.0170	0.0170	0.0000	200.5342	200.5342	0.0131	0.0000	200.8085
Total	0.0674	0.5439	0.4300	1.9900e-003		0.0174	0.0174		0.0170	0.0170	0.0000	200.5342	200.5342	0.0131	0.0000	200.8085

3.6 Year 4 - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0241	0.1087	0.8829	1.9900e-003		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	200.5339	200.5339	0.0131	0.0000	200.8082
Total	0.0241	0.1087	0.8829	1.9900e-003		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	200.5339	200.5339	0.0131	0.0000	200.8082

3.6 Year 4 - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.7 Year 5 - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7029	20.4274	18.0511	0.0845		0.6432	0.6432		0.6291	0.6291	0.0000	8,515.7605	8,515.7605	0.5223	0.0000	8,526.7288
Total	2.7029	20.4274	18.0511	0.0845		0.6432	0.6432		0.6291	0.6291	0.0000	8,515.7605	8,515.7605	0.5223	0.0000	8,526.7288

3.7 Year 5 - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.0200	4.5965	37.4308	0.0845		0.1354	0.1354		0.1354	0.1354	0.0000	8,515.7503	8,515.7503	0.5223	0.0000	8,526.7187
Total	1.0200	4.5965	37.4308	0.0845		0.1354	0.1354		0.1354	0.1354	0.0000	8,515.7503	8,515.7503	0.5223	0.0000	8,526.7187

3.7 Year 5 - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.8 Year 6 - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1135	0.7954	0.7897	3.7200e-003		0.0245	0.0245		0.0239	0.0239	0.0000	374.6104	374.6104	0.0229	0.0000	375.0915
Total	0.1135	0.7954	0.7897	3.7200e-003		0.0245	0.0245		0.0239	0.0239	0.0000	374.6104	374.6104	0.0229	0.0000	375.0915

3.8 Year 6 - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0449	0.2022	1.6465	3.7200e-003		5.9500e-003	5.9500e-003		5.9500e-003	5.9500e-003	0.0000	374.6099	374.6099	0.0229	0.0000	375.0911
Total	0.0449	0.2022	1.6465	3.7200e-003		5.9500e-003	5.9500e-003		5.9500e-003	5.9500e-003	0.0000	374.6099	374.6099	0.0229	0.0000	375.0911

3.8 Year 6 - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.9 Year 7 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4338	3.0420	3.0191	0.0142		0.0936	0.0936		0.0914	0.0914	0.0000	1,431.4607	1,431.4607	0.0879	0.0000	1,433.3055
Total	0.4338	3.0420	3.0191	0.0142		0.0936	0.0936		0.0914	0.0914	0.0000	1,431.4607	1,431.4607	0.0879	0.0000	1,433.3055

3.9 Year 7 - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1715	0.7728	6.2926	0.0142		0.0228	0.0228		0.0228	0.0228	0.0000	1,431.4590	1,431.4590	0.0879	0.0000	1,433.3038
Total	0.1715	0.7728	6.2926	0.0142		0.0228	0.0228		0.0228	0.0228	0.0000	1,431.4590	1,431.4590	0.0879	0.0000	1,433.3038

3.9 Year 7 - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.10 Year 8 - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1747	1.2254	1.2152	5.7100e-003		0.0378	0.0378		0.0369	0.0369	0.0000	575.1511	575.1511	0.0357	0.0000	575.9000
Total	0.1747	1.2254	1.2152	5.7100e-003		0.0378	0.0378		0.0369	0.0369	0.0000	575.1511	575.1511	0.0357	0.0000	575.9000

3.10 Year 8 - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0689	0.3108	2.5294	5.7100e-003		9.1500e-003	9.1500e-003		9.1500e-003	9.1500e-003	0.0000	575.1504	575.1504	0.0357	0.0000	575.8993
Total	0.0689	0.3108	2.5294	5.7100e-003		9.1500e-003	9.1500e-003		9.1500e-003	9.1500e-003	0.0000	575.1504	575.1504	0.0357	0.0000	575.8993

3.10 Year 8 - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.11 Year 9 - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1486	1.0427	1.0331	4.8500e-003		0.0323	0.0323		0.0315	0.0315	0.0000	488.1163	488.1163	0.0306	0.0000	488.7585
Total	0.1486	1.0427	1.0331	4.8500e-003		0.0323	0.0323		0.0315	0.0315	0.0000	488.1163	488.1163	0.0306	0.0000	488.7585

3.11 Year 9 - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0585	0.2641	2.1476	4.8500e-003		7.7700e-003	7.7700e-003		7.7700e-003	7.7700e-003	0.0000	488.1157	488.1157	0.0306	0.0000	488.7579
Total	0.0585	0.2641	2.1476	4.8500e-003		7.7700e-003	7.7700e-003		7.7700e-003	7.7700e-003	0.0000	488.1157	488.1157	0.0306	0.0000	488.7579

3.11 Year 9 - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.12 Year 10 - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3986	2.7948	2.7732	0.0131		0.0861	0.0861		0.0841	0.0841	0.0000	1,314.3448	1,314.3448	0.0809	0.0000	1,316.0427
Total	0.3986	2.7948	2.7732	0.0131		0.0861	0.0861		0.0841	0.0841	0.0000	1,314.3448	1,314.3448	0.0809	0.0000	1,316.0427

3.12 Year 10 - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1575	0.7097	5.7783	0.0131		0.0209	0.0209		0.0209	0.0209	0.0000	1,314.343 2	1,314.343 2	0.0809	0.0000	1,316.041 1
Total	0.1575	0.7097	5.7783	0.0131		0.0209	0.0209		0.0209	0.0209	0.0000	1,314.343 2	1,314.343 2	0.0809	0.0000	1,316.041 1

3.12 Year 10 - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.13 Year 11 - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.5167	1.9830	4.1192	0.0205		0.0616	0.0616		0.0616	0.0616	0.0000	2,104.2523	2,104.2523	0.0395	0.0000	2,105.0816
Total	0.5167	1.9830	4.1192	0.0205		0.0616	0.0616		0.0616	0.0616	0.0000	2,104.2523	2,104.2523	0.0395	0.0000	2,105.0816

3.13 Year 11 - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2461	1.1097	9.0295	0.0205		0.0327	0.0327		0.0327	0.0327	0.0000	2,104.2498	2,104.2498	0.0395	0.0000	2,105.0791
Total	0.2461	1.1097	9.0295	0.0205		0.0327	0.0327		0.0327	0.0327	0.0000	2,104.2498	2,104.2498	0.0395	0.0000	2,105.0791

3.13 Year 11 - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.14 Year 12 - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3528	1.3535	2.8117	0.0140		0.0421	0.0421		0.0421	0.0421	0.0000	1,436.0790	1,436.0790	0.0270	0.0000	1,436.6452
Total	0.3528	1.3535	2.8117	0.0140		0.0421	0.0421		0.0421	0.0421	0.0000	1,436.0790	1,436.0790	0.0270	0.0000	1,436.6452

3.14 Year 12 - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1679	0.7575	6.1624	0.0140		0.0223	0.0223		0.0223	0.0223	0.0000	1,436.0773	1,436.0773	0.0270	0.0000	1,436.6435
Total	0.1679	0.7575	6.1624	0.0140		0.0223	0.0223		0.0223	0.0223	0.0000	1,436.0773	1,436.0773	0.0270	0.0000	1,436.6435

3.14 Year 12 - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.15 Year 13 - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3857	1.4796	3.0738	0.0153		0.0460	0.0460		0.0460	0.0460	0.0000	1,569.8027	1,569.8027	0.0295	0.0000	1,570.4218
Total	0.3857	1.4796	3.0738	0.0153		0.0460	0.0460		0.0460	0.0460	0.0000	1,569.8027	1,569.8027	0.0295	0.0000	1,570.4218

3.15 Year 13 - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1836	0.8282	6.7363	0.0153		0.0244	0.0244		0.0244	0.0244	0.0000	1,569.8009	1,569.8009	0.0295	0.0000	1,570.4200
Total	0.1836	0.8282	6.7363	0.0153		0.0244	0.0244		0.0244	0.0244	0.0000	1,569.8009	1,569.8009	0.0295	0.0000	1,570.4200

3.15 Year 13 - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.16 Year 14 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1266	0.4847	1.0071	5.0000e-003		0.0151	0.0151		0.0151	0.0151	0.0000	513.6884	513.6884	9.6800e-003	0.0000	513.8916
Total	0.1266	0.4847	1.0071	5.0000e-003		0.0151	0.0151		0.0151	0.0151	0.0000	513.6884	513.6884	9.6800e-003	0.0000	513.8916

3.16 Year 14 - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0601	0.2714	2.2047	5.0000e-003		7.9700e-003	7.9700e-003		7.9700e-003	7.9700e-003	0.0000	513.6878	513.6878	9.6800e-003	0.0000	513.8910
Total	0.0601	0.2714	2.2047	5.0000e-003		7.9700e-003	7.9700e-003		7.9700e-003	7.9700e-003	0.0000	513.6878	513.6878	9.6800e-003	0.0000	513.8910

3.16 Year 14 - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.17 Year 15 - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4364	1.6737	3.4770	0.0173		0.0520	0.0520		0.0520	0.0520	0.0000	1,775.5315	1,775.5315	0.0334	0.0000	1,776.2320
Total	0.4364	1.6737	3.4770	0.0173		0.0520	0.0520		0.0520	0.0520	0.0000	1,775.5315	1,775.5315	0.0334	0.0000	1,776.2320

3.17 Year 15 - 2034

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2076	0.9369	7.6192	0.0173		0.0276	0.0276		0.0276	0.0276	0.0000	1,775.5294	1,775.5294	0.0334	0.0000	1,776.2298
Total	0.2076	0.9369	7.6192	0.0173		0.0276	0.0276		0.0276	0.0276	0.0000	1,775.5294	1,775.5294	0.0334	0.0000	1,776.2298

3.17 Year 15 - 2034

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.18 Year 16 - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.8772	2.5474	7.5250	0.0375		0.0830	0.0830		0.0830	0.0830	0.0000	3,852.239 2	3,852.239 2	0.0662	0.0000	3,853.629 5
Total	0.8772	2.5474	7.5250	0.0375		0.0830	0.0830		0.0830	0.0830	0.0000	3,852.239 2	3,852.239 2	0.0662	0.0000	3,853.629 5

3.18 Year 16 - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4503	2.0242	16.5224	0.0375		0.0598	0.0598		0.0598	0.0598	0.0000	3,852.2347	3,852.2347	0.0662	0.0000	3,853.6249
Total	0.4503	2.0242	16.5224	0.0375		0.0598	0.0598		0.0598	0.0598	0.0000	3,852.2347	3,852.2347	0.0662	0.0000	3,853.6249

3.18 Year 16 - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

3.19 Year 17 - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1648	0.4789	1.4110	7.0100e-003		0.0155	0.0155		0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120
Total	0.1648	0.4789	1.4110	7.0100e-003		0.0155	0.0155		0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120

3.19 Year 17 - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0497	720.0497	0.0125	0.0000	720.3111
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0497	720.0497	0.0125	0.0000	720.3111

3.19 Year 17 - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.20 Year 18 - 2037

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1648	0.4789	1.4110	7.0100e-003		0.0155	0.0155		0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120
Total	0.1648	0.4789	1.4110	7.0100e-003		0.0155	0.0155		0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120

3.20 Year 18 - 2037

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0497	720.0497	0.0125	0.0000	720.3111
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0497	720.0497	0.0125	0.0000	720.3111

3.20 Year 18 - 2037

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.21 Year 19 - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1648	0.4789	1.4110	7.0100e-003		0.0155	0.0155		0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120
Total	0.1648	0.4789	1.4110	7.0100e-003		0.0155	0.0155		0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120

3.21 Year 19 - 2038

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0497	720.0497	0.0125	0.0000	720.3111
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0497	720.0497	0.0125	0.0000	720.3111

3.21 Year 19 - 2038

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.22 Year 20 - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1648	0.4789	1.4110	7.0100e-003		0.0155	0.0155		0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120
Total	0.1648	0.4789	1.4110	7.0100e-003		0.0155	0.0155		0.0155	0.0155	0.0000	720.0505	720.0505	0.0125	0.0000	720.3120

3.22 Year 20 - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0497	720.0497	0.0125	0.0000	720.3111
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0497	720.0497	0.0125	0.0000	720.3111

3.22 Year 20 - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.23 Year 21 - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
Total	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127

3.23 Year 21 - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119

3.23 Year 21 - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.24 Year 22 - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
Total	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127

3.24 Year 22 - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119

3.24 Year 22 - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.25 Year 23 - 2042

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
Total	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127

3.25 Year 23 - 2042

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119

3.25 Year 23 - 2042

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.26 Year 24 - 2043

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
Total	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127

3.26 Year 24 - 2043

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119

3.26 Year 24 - 2043

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.27 Year 25 - 2044

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
Total	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127

3.27 Year 25 - 2044

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119

3.27 Year 25 - 2044

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.28 Year 26 - 2045

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
Total	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127

3.28 Year 26 - 2045

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119

3.28 Year 26 - 2045

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.29 Year 27 - 2046

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
Total	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127

3.29 Year 27 - 2046

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119

3.29 Year 27 - 2046

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.30 Year 28 - 2047

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
Total	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127

3.30 Year 28 - 2047

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119

3.30 Year 28 - 2047

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.31 Year 29 - 2048

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
Total	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127

3.31 Year 29 - 2048

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119

3.31 Year 29 - 2048

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.32 Year 30 - 2049

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127
Total	0.1595	0.4118	1.4108	7.0100e-003		0.0129	0.0129		0.0129	0.0129	0.0000	720.0516	720.0516	0.0124	0.0000	720.3127

3.32 Year 30 - 2049

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119
Total	0.0842	0.3804	3.0901	7.0100e-003		0.0112	0.0112		0.0112	0.0112	0.0000	720.0508	720.0508	0.0124	0.0000	720.3119

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	8.80	4.60	4.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.491782	0.035344	0.208299	0.151084	0.049421	0.007284	0.022101	0.017711	0.002208	0.002109	0.008228	0.001403	0.003026

5.0 Energy Detail

~~4.4 Fleet Mix~~

Historical Energy Use: N

5.1 Mitigation Measures Energy

5.2 Energy by Land Use - NaturalGas

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000					0.0000	0.0000		0.0000							

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000					0.0000	0.0000		0.0000							

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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AERA - Santa Barbara - Cat Canyon Drilling Unpaved Road Travel Emissions
Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - Anticipated Construction Schedule Provided by the Project Applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

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Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Trips and VMT - Applicant estimations for worker and vendor trips per day for drilling and hookup activities with an average of 0.6 miles of unpaved travel per trip.

On-road Fugitive Dust - This is a unpaved road travel only run so % Paved was set to zero.

Vehicle Trips - Construction Run Only

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust -

Consumer Products - Construction Run Only

Landscape Equipment - Construction Run Only

Construction Off-road Equipment Mitigation -

Area Coating -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	105.00
tblConstructionPhase	NumDays	155,000.00	158.00
tblConstructionPhase	NumDays	155,000.00	106.00

tblConstructionPhase	NumDays	155,000.00	130.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	131.00
tblConstructionPhase	NumDays	155,000.00	287.00
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDays	155,000.00	313.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	51.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	26.00
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDays	155,000.00	26.00
tblConstructionPhase	NumDays	155,000.00	26.00
tblConstructionPhase	NumDays	155,000.00	314.00
tblConstructionPhase	NumDays	155,000.00	53.00
tblConstructionPhase	NumDays	155,000.00	132.00
tblConstructionPhase	NumDays	155,000.00	52.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	12/30/2027	10/31/2028
tblConstructionPhase	PhaseEndDate	3/2/2029	10/31/2029
tblConstructionPhase	PhaseEndDate	5/3/2030	10/31/2030
tblConstructionPhase	PhaseEndDate	3/4/2031	10/31/2031
tblConstructionPhase	PhaseEndDate	3/31/2032	10/29/2032
tblConstructionPhase	PhaseEndDate	12/29/2032	10/31/2033
tblConstructionPhase	PhaseEndDate	4/1/2034	10/31/2034
tblConstructionPhase	PhaseEndDate	10/1/2035	11/30/2035
tblConstructionPhase	PhaseEndDate	1/31/2036	10/31/2036
tblConstructionPhase	PhaseEndDate	1/1/2037	10/31/2037
tblConstructionPhase	PhaseEndDate	10/31/2019	12/31/2019
tblConstructionPhase	PhaseEndDate	12/31/2037	10/30/2038
tblConstructionPhase	PhaseEndDate	12/29/2038	10/29/2039
tblConstructionPhase	PhaseEndDate	12/29/2039	10/31/2040
tblConstructionPhase	PhaseEndDate	12/31/2040	10/31/2041
tblConstructionPhase	PhaseEndDate	1/1/2042	10/31/2042
tblConstructionPhase	PhaseEndDate	1/1/2043	10/31/2043
tblConstructionPhase	PhaseEndDate	12/31/2043	10/31/2044
tblConstructionPhase	PhaseEndDate	12/30/2044	10/31/2045
tblConstructionPhase	PhaseEndDate	12/30/2045	10/31/2046
tblConstructionPhase	PhaseEndDate	12/31/2046	10/31/2047
tblConstructionPhase	PhaseEndDate	1/30/2020	10/30/2021
tblConstructionPhase	PhaseEndDate	1/1/2048	10/31/2048
tblConstructionPhase	PhaseEndDate	12/31/2048	10/31/2049
tblConstructionPhase	PhaseEndDate	11/30/2021	10/31/2022
tblConstructionPhase	PhaseEndDate	11/30/2022	10/31/2023
tblConstructionPhase	PhaseEndDate	10/31/2024	12/31/2024

tblConstructionPhase	PhaseEndDate	3/3/2025	10/31/2025
tblConstructionPhase	PhaseEndDate	4/3/2026	10/31/2026
tblConstructionPhase	PhaseEndDate	12/31/2026	10/30/2027
tblConstructionPhase	PhaseStartDate	10/31/2027	9/1/2028
tblConstructionPhase	PhaseStartDate	11/1/2028	7/1/2029
tblConstructionPhase	PhaseStartDate	11/1/2029	5/1/2030
tblConstructionPhase	PhaseStartDate	11/1/2030	7/1/2031
tblConstructionPhase	PhaseStartDate	11/1/2031	6/1/2032
tblConstructionPhase	PhaseStartDate	10/30/2032	9/1/2033
tblConstructionPhase	PhaseStartDate	11/1/2033	6/1/2034
tblConstructionPhase	PhaseStartDate	11/1/2034	1/1/2035
tblConstructionPhase	PhaseStartDate	12/1/2035	9/1/2036
tblConstructionPhase	PhaseStartDate	11/1/2036	9/1/2037
tblConstructionPhase	PhaseStartDate	11/1/2018	1/1/2019
tblConstructionPhase	PhaseStartDate	11/1/2037	9/1/2038
tblConstructionPhase	PhaseStartDate	10/31/2038	9/1/2039
tblConstructionPhase	PhaseStartDate	10/30/2039	9/1/2040
tblConstructionPhase	PhaseStartDate	11/1/2040	9/1/2041
tblConstructionPhase	PhaseStartDate	11/1/2041	9/1/2042
tblConstructionPhase	PhaseStartDate	11/1/2042	9/1/2043
tblConstructionPhase	PhaseStartDate	11/1/2043	9/1/2044
tblConstructionPhase	PhaseStartDate	11/1/2044	9/1/2045
tblConstructionPhase	PhaseStartDate	11/1/2045	9/1/2046
tblConstructionPhase	PhaseStartDate	11/1/2046	9/1/2047
tblConstructionPhase	PhaseStartDate	1/1/2020	10/1/2021
tblConstructionPhase	PhaseStartDate	11/1/2047	9/1/2048
tblConstructionPhase	PhaseStartDate	11/1/2048	9/1/2049
tblConstructionPhase	PhaseStartDate	10/31/2021	10/1/2022

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2034					2.5264			0.2522								
2035					5.5235			0.5513								
2036					1.0220			0.1020								
2037					1.0220			0.1020								
2038					1.0027			0.1001								
2039					0.9835			0.0981								
2040					1.0027			0.1001								
2041					1.0027			0.1001								
2042					1.0220			0.1020								
2043					1.0220			0.1020								
2044					1.0027			0.1001								
2045					1.0027			0.1001								
2046					1.0027			0.1001								
2047					1.0027			0.1001								
2048					1.0220			0.1020								
2049					1.0027			0.1001								
Total					53.3130			5.3206								

2.1 Overall Construction

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Year -2	Building Construction	9/1/2018	10/31/2018	6	52	
2	Year -1	Building Construction	1/1/2019	12/31/2019	6	313	
3	Year 2	Building Construction	10/1/2021	10/30/2021	6	26	

4	Year 3	Building Construction	10/1/2022	10/31/2022	6	26
5	Year 4	Building Construction	10/1/2023	10/31/2023	6	26
6	Year 5	Building Construction	1/1/2024	12/31/2024	6	314
7	Year 6	Building Construction	9/1/2025	10/31/2025	6	53
8	Year 7	Building Construction	6/1/2026	10/31/2026	6	132
9	Year 8	Building Construction	9/1/2027	10/30/2027	6	52
10	Year 9	Building Construction	9/1/2028	10/31/2028	6	52
11	Year 10	Building Construction	7/1/2029	10/31/2029	6	105
12	Year 11	Building Construction	5/1/2030	10/31/2030	6	158
13	Year 12	Building Construction	7/1/2031	10/31/2031	6	106
14	Year 13	Building Construction	6/1/2032	10/29/2032	6	130
15	Year 14	Building Construction	9/1/2033	10/31/2033	6	52
16	Year 15	Building Construction	6/1/2034	10/31/2034	6	131
17	Year 16	Building Construction	1/1/2035	11/30/2035	6	287
18	Year 17	Building Construction	9/1/2036	10/31/2036	6	53
19	Year 18	Building Construction	9/1/2037	10/31/2037	6	53
20	Year 19	Building Construction	9/1/2038	10/30/2038	6	52
21	Year 20	Building Construction	9/1/2039	10/29/2039	6	51
22	Year 21	Building Construction	9/1/2040	10/31/2040	6	52
23	Year 22	Building Construction	9/1/2041	10/31/2041	6	52
24	Year 23	Building Construction	9/1/2042	10/31/2042	6	53
25	Year 24	Building Construction	9/1/2043	10/31/2043	6	53
26	Year 25	Building Construction	9/1/2044	10/31/2044	6	52
27	Year 26	Building Construction	9/1/2045	10/31/2045	6	52
28	Year 27	Building Construction	9/1/2046	10/31/2046	6	52
29	Year 28	Building Construction	9/1/2047	10/31/2047	6	52
30	Year 29	Building Construction	9/1/2048	10/31/2048	6	53
31	Year 30	Building Construction	9/1/2049	10/31/2049	6	52

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
------------	------------------------	--------	-------------	-------------	-------------

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Year -2	0	47.00	1.20	0.00	0.60	0.60		LD_Mix	HHDT	
Year 9	0	47.00	1.20	0.00	0.60	0.60		LD_Mix	HHDT	
Year 10	0	47.00	1.60	0.00	0.60	0.60		LD_Mix	HHDT	
Year 11	0	47.00	1.60	0.00	0.60	0.60		LD_Mix	HHDT	
Year 12	0	47.00	1.60	0.00	0.60	0.60		LD_Mix	HHDT	
Year 13	0	47.00	1.40	0.00	0.60	0.60		LD_Mix	HHDT	
Year 14	0	47.00	1.20	0.00	0.60	0.60		LD_Mix	HHDT	
Year 15	0	47.00	1.60	0.00	0.60	0.60		LD_Mix	HHDT	
Year 16	0	47.00	1.50	0.00	0.60	0.60		LD_Mix	HHDT	
Year 17	0	47.00	1.60	0.00	0.60	0.60		LD_Mix	HHDT	
Year 18	0	47.00	1.60	0.00	0.60	0.60		LD_Mix	HHDT	
Year -1	0	47.00	3.30	0.00	0.60	0.60		LD_Mix	HHDT	
Year 19	0	47.00	1.60	0.00	0.60	0.60		LD_Mix	HHDT	
Year 20	0	47.00	1.60	0.00	0.60	0.60		LD_Mix	HHDT	
Year 21	0	47.00	1.60	0.00	0.60	0.60		LD_Mix	HHDT	
Year 22	0	47.00	1.60	0.00	0.60	0.60		LD_Mix	HHDT	

Year 23	0	47.00	1.60	0.00	0.60	0.60	LD_Mix	HHDT
Year 24	0	47.00	1.60	0.00	0.60	0.60	LD_Mix	HHDT
Year 25	0	47.00	1.60	0.00	0.60	0.60	LD_Mix	HHDT
Year 26	0	47.00	1.60	0.00	0.60	0.60	LD_Mix	HHDT
Year 27	0	47.00	1.60	0.00	0.60	0.60	LD_Mix	HHDT
Year 28	0	47.00	1.60	0.00	0.60	0.60	LD_Mix	HHDT
Year 2	0	47.00	0.90	0.00	0.60	0.60	LD_Mix	HHDT
Year 29	0	47.00	1.60	0.00	0.60	0.60	LD_Mix	HHDT
Year 30	0	47.00	1.60	0.00	0.60	0.60	LD_Mix	HHDT
Year 3	0	47.00	0.90	0.00	0.60	0.60	LD_Mix	HHDT
Year 4	0	47.00	0.90	0.00	0.60	0.60	LD_Mix	HHDT
Year 5	0	47.00	3.40	0.00	0.60	0.60	LD_Mix	HHDT
Year 6	0	47.00	0.90	0.00	0.60	0.60	LD_Mix	HHDT
Year 7	0	47.00	1.40	0.00	0.60	0.60	LD_Mix	HHDT
Year 8	0	47.00	1.40	0.00	0.60	0.60	LD_Mix	HHDT

3.1 Mitigation Measures Construction

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.32 Year 30 - 2049

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling					0.0000			0.0000									
Vendor					0.0330			3.2900e-003									
Worker					0.9697			0.0968									
Total					1.0027			0.1001									

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling					0.0000			0.0000									
Vendor					0.0202			2.0100e-003									
Worker					0.5937			0.0592									
Total					0.6140			0.0612									

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	8.80	4.60	4.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.491782	0.035344	0.208299	0.151084	0.049421	0.007284	0.022101	0.017711	0.002208	0.002109	0.008228	0.001403	0.003026

5.0 Energy Detail

4.4 Fleet Mix

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Land Use	kBTU/yr	tons/yr										MT/yr						
User Defined Industrial	0																	
Total																		

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0				
Total					

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
SubCategory	tons/yr										MT/yr						
Architectural Coating																	
Total																	

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
SubCategory	tons/yr										MT/yr						
Architectural Coating																	
Total																	

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				
Unmitigated				

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0				
Total					

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0				
Total					

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				
Unmitigated				

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0				
Total					

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0				
Total					

9.0 Operational Offroad

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

10.0 Vegetation

AERA - Santa Barbara - Cat Canyon Operational Unpaved Road Travel Daily Emissions
Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - Anticipated Schedule Provided by the Project Applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Trips and VMT - Applicant estimates. Vendor trips = O&M Trucks driving on-site. Average daily unpaved mileage = 5 per truck. MHDT used since there is not option for LHDT1 or LHDT2.

On-road Fugitive Dust - This is a unpaved road travel only run so % Paved was set to zero.

Vehicle Trips - Construction Run Only

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust -

Consumer Products - Construction Run Only

Area Coating -

Landscape Equipment - Construction Run Only

Construction Off-road Equipment Mitigation - x

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstructionPhase	NumDays	155,000.00	365.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblLandUse	LotAcreage	0.00	2,100.00
tblOnRoadDust	HaulingPercentPave	100.00	0.00
tblOnRoadDust	VendorPercentPave	100.00	0.00
tblOnRoadDust	WorkerPercentPave	100.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2021
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	4.60	5.00
tblTripsAndVMT	VendorVehicleClass		MHDT
tblTripsAndVMT	WorkerTripLength	12.30	0.00
tblTripsAndVMT	WorkerVehicleClass		LD_Mix

2.0 Emissions Summary

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	O&M	Building Construction	1/1/2021	12/31/2021	7	365	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
O&M	0		16.00	0.00	0.00	5.00		LD_Mix	MHDT	

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 O&M - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling					0.0000			0.0000									
Vendor					19.3139			1.9284									
Worker					0.0000			0.0000									
Total					19.3139			1.9284									

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling					0.0000			0.0000									
Vendor					2.3686			0.2373									
Worker					0.0000			0.0000									
Total					2.3686			0.2373									

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	8.80	4.60	4.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.487584	0.036203	0.211898	0.154965	0.049811	0.007441	0.020251	0.014775	0.001943	0.002196	0.008223	0.001557	0.003151

5.0 Energy Detail

4.4 Fleet Mix

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Land Use	kBTU/yr	tons/yr										MT/yr						
User Defined Industrial	0																	
Total																		

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0				
Total					

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
SubCategory	tons/yr										MT/yr						
Architectural Coating	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Total																	

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
SubCategory	tons/yr										MT/yr						
Architectural Coating	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Total																	

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				
Unmitigated				

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0				
Total					

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0				
Total					

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				
Unmitigated				

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0				
Total					

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0				
Total					

9.0 Operational Offroad

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

AERA - Santa Barbara - Cat Canyon Operational Unpaved Road Travel Daily Emissions

Santa Barbara-North of Santa Ynez County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	2,100.00	User Defined Unit	2,100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.1	Precipitation Freq (Days)	37
Climate Zone	4			Operational Year	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project will be located in the East Cat Canyon oil field on approximately 2,100 acres.

Construction Phase - Anticipated Schedule Provided by the Project Applicant.

Off-road Equipment - Units and Hours/day provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.

Trips and VMT - Applicant estimates. Vendor trips = O&M Trucks driving on-site. Average daily unpaved mileage = 5 per truck. MHDT used since there is not option for LHDT1 or LHDT2.

On-road Fugitive Dust - This is a unpaved road travel only run so % Paved was set to zero.

Vehicle Trips - Construction Run Only

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust -

Consumer Products - Construction Run Only

Area Coating -

Landscape Equipment - Construction Run Only

Construction Off-road Equipment Mitigation - x

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstructionPhase	NumDays	155,000.00	365.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblLandUse	LotAcreage	0.00	2,100.00
tblOnRoadDust	HaulingPercentPave	100.00	0.00
tblOnRoadDust	VendorPercentPave	100.00	0.00
tblOnRoadDust	WorkerPercentPave	100.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2021
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	4.60	5.00
tblTripsAndVMT	VendorVehicleClass		MHDT
tblTripsAndVMT	WorkerTripLength	12.30	0.00
tblTripsAndVMT	WorkerVehicleClass		LD_Mix

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	O&M	Building Construction	1/1/2021	12/31/2021	7	365	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
O&M	0	16.00	0.00	0.00	5.00			LD_Mix	MHDT	

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	8.80	4.60	4.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.487584	0.036203	0.211898	0.154965	0.049811	0.007441	0.020251	0.014775	0.001943	0.002196	0.008223	0.001557	0.003151

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
SubCategory	lb/day										lb/day						
Architectural Coating																	
Landscaping																	
Total																	

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
SubCategory	lb/day										lb/day						
Architectural Coating																	
Landscaping																	
Total																	

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

ATTACHMENT C

Santa Barbara County Air Pollution Control District's Health Risk Analysis

Health Risk Assessment Report

Aera Energy LLC - East Cat Canyon

East Cat Canyon Oil Field Redevelopment Project California Environmental Quality Act

1.0 SUMMARY

The Santa Barbara County Air Pollution Control District (District) conducted an air toxics Health Risk Assessment (HRA) for Aera Energy LLC for their East Cat Canyon Oil Field Redevelopment Project under the California Environmental Quality Act (CEQA). The HRA was completed using Lakes AERMOD View, Version 9.5.0 and the Hotspots Analysis and Reporting Program (HARP) software, Version 2.0.0.7 (Build 17052). Aera Energy LLC (“Aera”) submitted the HRA for the project, and the District revised the modeling and completed the final HRA and report in order to expedite the CEQA process. Cancer risk and non-cancer Hazard Index (HI) risk values were calculated and compared to *significance thresholds* adopted by the District’s Board of Directors. The calculated risk values and applicable thresholds are as follows:

	<u>Aera East CC Max Risks</u>	<u>Significance Threshold</u>
Cancer risk:	9.1/million	≥10/million
Chronic non-cancer risk:	0.1	>1
Chronic 8-hour non-cancer risk:	<0.1	>1
Acute non-cancer risk:	0.6	>1

Based on these results, Aera’s East Cat Canyon Oil Field Redevelopment Project would not present a significant risk to the surrounding community.

2.0 BACKGROUND

2.1 Project Overview

Aera’s East Cat Canyon Oil Field Redevelopment Project will re-establish oil production in an existing field in which oil operations began over 100 years ago. Project plans include construction and restoration of well pads, construction and restoration of field access roads, and drilling of 296 wells including oil/gas production wells, steam injection wells, observation wells, water production wells, water injection wells, and fresh groundwater wells. In addition, new processing facilities and field systems will be constructed.

Aera submitted an application package to the County of Santa Barbara Planning and Development (P&D) to request approval of an Oil and Gas Drilling/Production Plan to reestablish oil production within the

Brooks sand (reservoir) underlying the Cat Canyon Oil Field. P&D is the lead agency under the CEQA. The District is a responsible agency under CEQA.

Aera submitted a permit application to the District for this project under Authority to Construct (ATC) No. 14624. The District completed an HRA for the ATC 14624. However, the ATC will not be issued until the CEQA process is complete and the lead agency issues their permit. The results of the HRA for ATC 14624 are summarized in the draft document *Health Risk Assessment Report: Aera Energy LLC – East Cat Canyon*, which is found in the References section of this report.

The HRA discussed in this report is for CEQA, which includes all the emissions modeled in the HRA for the District's permit, plus emissions from vehicles, ongoing maintenance and operation (O&M) activities and well drilling.

2.2 *Health Risk*

As used in this report, the term “health risk” addresses the likelihood that exposure to a given toxic air contaminant under a given set of conditions will result in an adverse health effect. Health risk is affected by several factors, such as: the amount, toxicity, and concentration of the contaminant; the meteorological conditions; the distance from emission sources to people; the distance between emission sources; the age, health, and lifestyle of the people living or working at a location; and, the duration of exposure to the toxic air contaminant.

Health effects are divided into cancer and non-cancer risks. “Cancer risk” refers to the increased chance of contracting cancer as a result of an exposure, and is expressed as a probability: chances-in-a-million. The values expressed for cancer risk do not predict actual cases of cancer that will result from exposure to toxic air contaminants. Rather, they state a possible risk of contracting cancer over and above the background level.

For non-cancer health effects, risk is characterized by a “Hazard Index” (HI), which is obtained by dividing the predicted concentration of a toxic air contaminant (TAC) by a Reference Exposure Level (REL) for that pollutant that has been determined by health professionals, the Office of Environmental Health Hazard Assessment (OEHHA) and the California Air Resources Board (ARB). RELs are used as indicators of the potential adverse effects of chemicals. A REL is the concentration at or below which no adverse health effects are anticipated for specific exposure duration. Thus, the HI is a measure of the exposure relative to a level of safety and is appropriately protective of public health. Each TAC emitted by the facility has a different emission rate and a different REL. A HI for each TAC is calculated separately at each modeled receptor location. A composite HI at each receptor is then calculated as the sum of HIs for each individual TAC. The maximum HI reported here is the maximum composite HI among all receptors.

2.3 *Previous Health Risk Assessment Submittals*

On July 24, 2017, Aera submitted the CEQA HRA and Air Quality Impact Analysis (AQIA) files to the District. In August 2017, Aera submitted the CEQA document titled *East Cat Canyon Oil Field Redevelopment Air Quality Impact Assessment* to the District. Aera provided two additional submittals of emission calculation spreadsheets on September 6 and 25, 2017 in response to questions from the District on the calculation methodology. These submittals are included in the *Aera_CEQA_AQIAandHRA.zip* file in the Attachments section of this report.

Aera submitted an application document for ATC No. 14624 on April 17, 2015, which included the initial Air Quality Impact Analysis (AQIA) and Health Risk Assessment (HRA), titled *Application for Authorities to Construct East Cat Canyon Oil Field Redevelopment Project*. The AQIA was done using US EPA Industrial Source Complex – Short Term Model (ISC). The HRA was done using ISC and HARP1. The District deemed the application incomplete on May 13, 2015. Among many incompleteness issues were the AQIA and HRA, including the need for the dispersion modeling to be done in AERMOD and the risk assessment to be done in HARP2.

On September 9, 2015, Aera submitted a revised AQIA and HRA based on the Districts comments from May 13, 2015. The District found additional discrepancies and deemed the application incomplete on October 16, 2015. Aera addressed these comments and submitted their final AQIA and HRA in March 2016. The District reviewed the HRA, revised the modeling and emission calculations, and then performed the revised HRA for the project in order to expedite the permitting process. All of the documents discussed in this section may be found in the References section of this report.

3.0 FACILITY INFORMATION

EQUIPMENT OWNER/OPERATOR: Aera Energy LLC

SOURCE IDENTIFICATION NUMBER: 08811

EQUIPMENT LOCATION: 6516 Cat Canyon Road, Santa Maria, CA 93454

FACILITY UTM COORDINATES: Aera provided the UTM coordinates of the facility's property boundaries, buildings, emission release points, and receptor locations.

UTM Zone 10
Easting: 749000 m
Northing: 3858000 m
Datum: WGS84

EQUIPMENT DESCRIPTION: The HRA includes emissions from numerous pieces of equipment at 239 different emission points. This includes emissions from a flare, an internal combustion engine, steam generators, tanks, loading racks, solvent usage, wells, fugitive emissions from components, vehicles and other mobile equipment.

4.0 STACKS AND MODELING PARAMETERS (A.K.A. EMISSION RELEASE POINTS)

The stack location UTM coordinates and modeling parameters used in the dispersion modeling for the HRA are found in the file *APCD_Aera_HRA_Sources.xlsx* located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachments section of this report. All UTM coordinates in this report are in Zone 10 and the datum is WGS84. All source modeling parameters for equipment included in the ATC HRA were unchanged for this HRA. Table 4.1 describes the drilling and mobile sources modeled in the CEQA HRA that were *not* modeled in the ATC HRA. Emissions from vehicles operating within 1,000 feet of the property boundary were included in the CEQA HRA.

Table 4.1 – CEQA-Only Modeling Sources

Source ID	Description
SLINE1	Emissions from diesel trucks traveling from off-site to the main plant area within the facility
SLINE2	Vehicle emissions associated with operations and maintenance, including drilling, outside of the property boundary
SLINE3	Vehicle emissions associated with employee travel
VOL140-217	Emissions from diesel-fired equipment used to drill wells and emissions from drilling muds at each well pad

The District modeled the sources in Table 4.1 with source parameters and locations identical to those that were submitted by Aera, with one exception. The locations of sources VOL140 through VOL217 were slightly revised to match the locations of the corresponding sources VOL56 through VOL133 at each well pad. The change in location for each of the sources was less than 1 meter.

5.0 EMISSIONS

This section explains how the toxic emissions used in this HRA were calculated, and how they differ from the emission calculations that Aera submitted. For the proposed project equipment and operations, both hourly and annual emissions were calculated based on maximum potential to emit for the equipment. The facility’s toxics emission calculations may be found under *Aera East CC Toxics Emissions Summary_Revised by APCD.xlsx* and *Aera East CC Permit-Exempt Toxics Emissions for CEQA.xlsx* located in the *Aera_CEQA_AQIAandHRA.zip* file. The resulting facility emission profile for uploading into HARP2 may be found under *All_Emissions.csv* located in the *Aera_CEQA_AQIAandHRA.zip* file.

Revisions to Air Toxic Emission Calculations for Permitted Equipment

1. The District made minor corrections to ROC emissions. Weight fractions of toxics pollutants are applied to the ROC emissions to calculate the toxic emissions. The following corrections were made to ROC emissions.

a. The hourly ROC emissions for the loading racks (Source IDs VOL53 and VOL54) were corrected to reflect Table 12, *Stationary Source Potentials to Emit Normal Operations Scenario*, of Aera’s *Application for Authorities to Construct East Cat Canyon Oil Field Redevelopment Project* March 2016 Revision. The ROC emissions were shown by Aera as:

$$\left(\frac{5.95}{24}\right) + \left(\frac{5.59}{24}\right) = 0.481 \text{ lb/hr}$$

The District corrected the hourly ROC emissions to:

$$\left(\frac{5.95}{24}\right) + \left(\frac{5.95}{24}\right) = 0.496 \text{ lb/hr}$$

b. There was a slight difference between the AQIA emissions spreadsheet (i.e., Aera’s *AAQA Tables ATC_03062016.xlsx*) and the HRA emissions calculations for the 100 Barrel Drain Tanks (Stacks 16 and 17) due to rounding. The minor correction was made to the HRA emissions calculations (i.e., *Aera East CC Toxics Emissions Summary_Revised by APCD.xls*) to reflect the same value as in the AQIA emissions.

2. Metal emissions were added for the flare (Source ID STCK15), using emission factors from EPA's AP-42 Section 1.4 Table 1.4-4. The metal emissions are shown in *Table J-5: Toxic Emissions – Flare* on the *HRA Table 5* Tab of the spreadsheet *Aera East CC Toxics Emissions Summary_Revised by APCD.xls* located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachments section of this report.
3. A very minor correction was made to the beryllium emission factor for the steam generators (Source IDs STCK7 through STCK13). EPA's AP-42 Section 1.4 Table 1.4-4 shows the emission factor as 1.20E-5 lb/MMscf and notes to divide by 1020 to convert to lb/MMBtu. Dividing by 1020 results in 1.18 E-8 lb/MMBtu. Aera used 1.17 E-8 lb/MMBtu.
4. The District revised the H₂S emissions from fugitive gas components with low H₂S concentration. The 85 MMBtu/hr steam generators are fired on 16 ppmv H₂S gas and the 62.5 MMBtu/hr steam generators are fired on 80 ppmv H₂S gas. The District was unable to determine which components will emit 16 ppmv H₂S gas and which ones will emit 80 ppmv H₂S gas. For that reason, emissions from all sweetened gas (low H₂S concentration) components were based on 80 ppmv H₂S to be conservative.
5. The District revised the fuel usage for the natural gas-fired emergency internal combustion engine (Source ID STCK14) based on the fuel factor of 8360 Btu/bhp-hr (HHV ratio of 1.1 applied) found in the manufacturer's specifications.
6. The District made significant revisions to the solvent emissions. In general, Aera used an average weight fraction of the toxic pollutants from the Safety Data Sheets (SDS) instead of the maximum, as required by the District. The District's revisions can be seen in the tab titled *Solvents - Tables 13-15* of the file *Aera East CC Toxics Emissions Summary_Revised by APCD.xlsx*. Specific revisions are discussed further below:
 - a. Aera based the maximum hourly emissions on the annual emissions divided by 8760 hr/yr. Solvent usage is not a continuous operation. The District revised the maximum hourly emissions by assuming daily operations occurred for 8 hours per day:

$$\text{Hourly Emissions} = \frac{\text{Annual Emissions}}{365 \text{ days/year} * 8 \text{ hours/day}}$$

- b. The SDS for Amerlock 400 Resin showed that the Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700) CAS 25068-38-6 contained up to 75 weight percent of epichlorhydrin. The SDS for the Reaction product (CAS 25068-38-6) showed it contained up to 10 weight percent of epichlorhydrin (CAS 106898). The District revised to annual emissions calculations of epichlorhydrin to:

$$\text{Epichlorhydrin Emissions (lb/yr)} = \text{Amerlock 400 Resin annual usage} * 12.43 \text{ lb/gal} * 0.75 * 0.10$$

- c. The SDS for Interseal 670 HS Part B showed that it contained up to 25 weight percent xylene. Aera used 17.5 weight percent xylene. The District revised the calculation to use 25 weight percent xylene.
- d. The concentrations of the toxic pollutants in Amersfield Resin were revised to reflect the maximum concentration shown in the SDS.

- e. The concentrations of the toxic pollutants in SurfTreat 9214 were revised to reflect the maximum concentration shown in the SDS.
- f. The concentrations of the toxic pollutants in Hempadur 17369 were revised to reflect the maximum concentration shown in the SDS.
- g. Naphtha can be broken down further into toxic pollutants. A SDS for naphtha showed it contained approximately five weight percent xylene. The District included xylene at five weight percent as emissions from naphtha. Aera did not include any toxic pollutants for naphtha.

Revisions to Air Toxic Emission Calculations for CEQA-Only Emissions (Permit-Exempt Emissions)

1. The source SLINE3 (gasoline vehicles driven by Aera employees) was not included in the CEQA HRA submitted by Aera, but it was included in the CEQA AQIA that Aera submitted. The District added this source to the CEQA HRA using the same source parameters and ROC emissions from the AQIA submittal. The emissions from toxic pollutants were speciated from the ROC emissions for this source using the CARB VOC Speciation Profile #500 for Catalyst Light Duty Vehicles—Exhaust.
2. Drilling mud ROC emissions calculations were submitted by Aera in units of lb/day/well and lb/hr/well in the spreadsheet *Well Drilling Mud Emission Calcs.xlsx*, located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachments section of this report. The District speciated these ROC emissions into toxic pollutants using the CARB VOC Speciation Profile #757 for Oil & Gas Production Fugitives—Gas Service.
 - a. The annual emissions of ROCs were calculated by multiplying the ROC emissions in lb/day/well by the number of days of drilling for each well and the number of wells drilled in a year. In their permit application, Aera stated that 108 wells would be drilled in Phase I, spanning 4 years, and 188 wells would be drilled in Phase II, spanning 29 years. To be health protective, the District calculated drilling mud emissions based on the annualized number of wells drilled in one year for Phase I, which is 27 wells drilled per year. These emissions were divided evenly throughout the 78 volume sources located at well pads (Source IDs VOL140 through VOL217).
 - b. District email correspondence with Aera on October 5, 2017 (To: Robin Cobbs; From: Susan Perrell; *RE: Aera's CEQA HRA - Number of Simultaneous Well Drillings*) showed that only one drill rig will be located at a well pad at any one time. Furthermore, a maximum of two drilling rigs will be located at the stationary source simultaneously. For that reason, the hourly emissions of ROCs were calculated for one well being drilled at one well pad at a time, with a maximum of two wells being drilled onsite at any time. The emissions were assigned to sources VOL140 and VOL141, which are located in the northwest part of the property boundary. An acute analysis was conducted with emissions from one well being drilled assigned to each of the 78 volume sources VOL140 through VOL217, an overly conservative emissions scenario. The District determined that the well pad locations corresponding to sources VOL140 and VOL141 were the two locations nearest to the PMI for that scenario. Therefore, the maximum hourly emissions for two wells being drilled simultaneously were assigned to those two volume sources for the final acute analysis.

6.0 BUILDING INFORMATION

UTM coordinates and dimensions for buildings and structures were submitted by Aera. Building downwash was selected as a control option in the air dispersion analysis and all structures were included in the HRA. Building layouts are shown in Figure 1, *Building and Structures*, of Attachment J submitted by Aera on September 9, 2015. In addition, UTM coordinates and dimensions for buildings and structures are listed in *TABLE I-11: Structure Parameters Used to Calculate Building Downwash* of the file *AAQA Tables ATC_03062016 (Revised by APCD).xlsx*. These files are located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachment section of this report.

7.0 MET DATA & DEM FILES

Meteorological data used in the air dispersion analyses were acquired at the Santa Maria Airport from 2010-2014. These files, *SMX10-14.PFL* and *SMX10-14.SFC*, were processed by the District using AERMET version 14134. The PROFBASE parameter was set to 79.6 m for the Santa Maria Airport. This value was from the District's *Modeling Guidelines for Health Risk Assessments*. Terrain and receptor elevations were determined using 7.5 min USGS Digital Elevation Model (DEM) files for the surrounding areas. Version 11103 of EPA's AERMAP terrain processor was used. Elevations from the DEM files using AERMAP were *not* imported for the on-site buildings and sources because the site will be graded for this project. The graded elevations for the buildings and sources were provided by Aera. The Digital Elevation Model (DEM) files used were for Foxen Canyon, Tepusquet Canyon, Twitchell Dam and Sisquoc, which are located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachments section of this report.

8.0 MODEL INFORMATION

The air dispersion modeling was conducted using Lakes AERMOD View, Version 9.5.0, and the risk assessment was conducted using the California Air Resources Board Hotspots Analysis and Reporting Program, Version 2.0.0.7 (Build 17052). The regulatory default Control options were enabled, and the rural option was selected.

8.1 Receptor Placement

The receptors were placed 100 meters apart from the property boundary out to 2000 meters from the boundary. Boundary receptors were generated along the property boundary at 25 meters apart. A total of 5204 receptors were analyzed for the HRA, which included 620 property boundary receptors, 48 discrete residential receptors, four discrete worker receptors, 33 discrete road receptors, and grid receptors. In addition to the four worker receptors identified by Aera, the District also identified other potential receptors in the nearby offsite oil fields. Grid receptors were located at these locations, so placing additional discrete receptors was not necessary. There are no sensitive receptors such as schools, daycare facilities, hospitals, or care facilities located within two kilometers of the project site. However, Benjamin Foxen Elementary School is located approximately 2100 meters from the property boundary. The Sisquoc residential neighborhood is located adjacent to the Benjamin Foxen Elementary School. For that reason, a 25 meter grid (for a total of 750 grid receptors) was placed over the entire school's property boundary and the Sisquoc neighborhood to ensure that all potential risk receptors were evaluated. The UTM coordinates of the Sisquoc neighborhood and school receptors are located in *Sisquoc Receptors.csv*. No other sensitive receptors were modeled.

No onsite receptors were modeled for acute risk as the public will not have access to roadways on the project site. All receptors had a flagpole height of 1.5 meters. All grid and receptor data may be found in the file *Aera_CEQA_HRA.ADO* located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachments section of this report.

8.2 Residential Exposure and Pathways

The cancer risk for the residential receptors and the point of maximum impact (PMI) were determined using the “individual resident” receptor type, 30-year exposure duration and the intake rate from the “RMP using the Derived Method.” The chronic non-cancer hazard indices for the residential receptors and the PMI were determined using the “individual resident” receptor type and the intake rate from the “OEHHA Derived Method.”

Aera conducted an initial run for residential cancer risk, with the following pathways evaluated: inhalation, soil, dermal, mother’s milk, homegrown produce, chicken and egg. Based on the results of the initial run, Aera selected the appropriate pathway parameters for the final HRA multipathway analysis. The District used the same assumptions as Aera for finalizing the multipathway HRA. The pathway parameters are discussed below.

A conservative deposition rate of 0.05 m/s was selected for the initial and final runs. None of the fraction of time at home (FAH) values were applied for the initial run. Due to the presence of Benjamin Foxen Elementary School, the FAH values were selected only for ages over 16 years in the District’s final risk analysis. No inputs are required in the soil and mother’s milk pathways. “Warm” climate was selected for the dermal pathway for the initial and final runs. The default values for households that garden were used for the homegrown produce pathway for the initial and final runs. The default values for households that raise/hunt were used for the chicken and egg pathways for the initial and final runs. The default values from Tables 3.4.9.1 and 3.4.9.2 of the District’s *Modeling Guidelines for Health Risk Assessments* were used for the fractions of animal diet from contaminated source and the fractions of contaminated feed for the chickens and eggs for the initial and final runs. Chickens do not consume drinking water from a contaminated source (e.g., lake or pond), so the fraction of drinking water from contaminated sources was set to zero for the initial and final runs.

The pig and the dairy pathways were not included in the HRA because there are no pig farms and no dairy pastures within the initial isopleths of one per million for cancer risk or a hazard index of 0.1 for chronic non-cancer risk. The fish pathway and drinking water pathway were not included in the HRA because there are not any residential receptors with a pond, lake, or other surface water source within the initial isopleths of one per million for cancer risk or a hazard index of 0.1 for chronic non-cancer risk.

Because cattle grazing pastures could be located anywhere near the facility, the beef pathway was included in the final risk analysis for residential receptors. Aera determine that Receptor No. 140 (749820.11, 3856418.88) was the worst case receptor for the beef multipathway analysis. Therefore, Receptor No. 140 was used for the worst case pasture receptor during the final risk analysis. For ease of modeling, Aera used the conservative flagpole height of 1.5 meters for the pathway receptor instead of a zero flagpole height. The District used the same assumptions when finalizing the HRA.

The default values for households that raise/hunt were used for the beef pathway in the final risk analysis. The default value of 0.5 was used for the grazing fraction of beef from contaminated source. The cattle do not consume drinking water from a source (e.g., lake or pond) within the initial 1.0 in a million isopleth, so the fraction of drinking water from contaminated sources was set to zero.

The pathway parameters described above for residential cancer risk were also used for calculating the residential chronic non-cancer risk values.

8.3 Worker Exposure and Pathways

The cancer risks for the worker receptors were determined using the “worker” receptor type, 25-year exposure duration and the intake rate from the “OEHHA Derived Method.” The chronic non-cancer hazard indices for the worker receptors were determined using the “worker” receptor type and the intake rate from the “OEHHA Derived Method.”

The worker pathways (i.e., inhalation, soil and dermal) were enabled for the worker receptors. All of the worker receptors used the default moderate intensity 8-hour breathing rate, and the FAH does not apply to worker receptors.

The equipment that supports the primary function of the facility operates continuously. (Emergency equipment such as the flare and emergency generator do not operate continuously. Solvent operations are also not continuous.) Because the primary operations are continuous, workers are assumed to breathe the long-term annual average concentration during their work shift and no concentration adjustments were made when estimating the inhalation cancer risk. Furthermore, per OEHHA’s *Air Toxics Hot Spots Program: Risk Assessment Guidelines*, the 8-hour chronic non-cancer risk was only calculated for worker receptors. The 8-hour chronic non-cancer risk was based on the daily average 8-hour exposure for substances with 8-hour RELs. No worker adjustment factor was used because operations are continuous.

8.4 Acute Non-Cancer Analysis

The acute hazard indices were calculated for all receptors using the simple screening analysis. The screening acute risk is a timesaving approximation that is conservative in nature. It is calculated by assuming that the contribution of risk from each source is at its maximum at the same instant in time. The maximum hourly risk from each source is summed to give the screening value, as if they had all occurred at the same time. In reality, the time that the risk from each source is at a maximum will differ depending on location and meteorology. For the simple analysis, no receptors exceeded the significance threshold of 1.0. For that reason, the refined analysis was not performed.

9.0 RESULTS

Risk assessment results at the point of maximum impact (PMI) and the maximally exposed individual resident (MEIR) and worker (MEIW) receptor locations for cancer and for chronic, chronic 8-hour, and acute non-cancer health effects are shown in Tables 9.1 through 9.4. Risk management decisions are based on the italicized values.

Table 9.1– Cancer Risk at PMI, MEIR and MEIW Receptors

Type of Receptor	Receptor Number	Cancer Risk (in a million)	UTME (m)	UTMN (m)
PMI	4873	335.20	748151.04	3856563.23
MEIR	3751	<i>9.12</i>	749982.5	3855986.39
MEIW	1828	1.41	748368.06	3856277.37

Table 9.2– Chronic Non-Cancer Risk at PMI, MEIR and MEIW Receptors

Type of Receptor	Receptor Number	Chronic HI	UTME (m)	UTMN (m)
PMI	4873	1.824	748151.04	3856563.23
MEIR	3751	0.074	749982.5	3855986.39
MEIW	1828	0.050	748368.06	3856277.37

Table 9.3– Chronic 8-Hour Non-Cancer Risk at PMI and MEIW Receptors

Type of Receptor	Receptor Number	Chronic 8-Hour	UTME (m)	UTMN (m)
PMI	4871	0.084	748199.67	3856564.06
MEIW	1828	0.015	748368.06	3856277.37

Table 9.4– Acute Non-Cancer Risk at PMI, MEIR and MEIW Receptors

Type of Receptor	Receptor Number	Acute Screening HI	UTME (m)	UTMN (m)
PMI	4910	0.611	747786.23	3857177.75
MEIR	1873	0.145	748126.83	3856096.44
MEIW	1818	0.204	748938.93	3856074.23

The MEIW for cancer risk and chronic and 8-hour non-cancer risk occur at the same receptor, Receptor No. 1828, located near the south of the project’s central processing plant. The MEIW is at a neighboring oil field outside Aera’s property boundary. Aera did not identify this location as the MEIW in their HRA report. Based on Aera’s aerial photos (*ESRI Online Imagery Basemap (5/2010)*), there were no wells being actively pumped at this location. The District used Google Earth 2015 imagery that showed pumping equipment at this location. For that reason, the District evaluated worker exposure risk at this location. All risks were well below the District’s significance thresholds.

Attachments A1 and A2 show the residential cancer risk isopleth for the final risk analysis with the MEIR and PMI locations. There is no 1.0 in a million isopleth shown for the final risk analysis because none of the residential receptors were calculated to have a cancer risk at or below 1.0 in a million. In this analysis, the cancer risk from the beef pathway is at least 1.7 in a million. This is because HARP2 assumes that all residential receptors eat beef from cattle that are grazing on the same contaminated pasture. Unless the beef pathway is excluded, all residential receptors will have a minimum risk of 1.7 in a million, regardless of how far the receptor grid is extended. However, because the cancer risk at the MEIR was below the District’s threshold, refining these conservative assumptions was not required.

Attachments B1, B2 and B3 show the residential chronic non-cancer risk isopleth for the final risk analysis with the MEIR and PMI locations.

Attachments C1 and C2 show the worker cancer risk isopleths with the MEIW location. Attachments D1 and D2 show the worker chronic non-cancer risk isopleths with the MEIW location. The MEIW location is shown in Attachments E1 and E2 for the worker 8-hour chronic non-cancer risk. The 8-hour chronic non-cancer risk isopleths were not plotted because none of the receptors were calculated to have an 8-hour chronic HI of 0.1 or greater (i.e., no isopleth could be created for a HI of 1.0 or 0.1).

The 0.1 HI isopleth for the acute non-cancer risk is shown in Attachment F. There is no 1.0 acute HI isopleth shown for the risk analysis because none of the receptors were calculated to have an acute non-cancer risk of 1.0 or greater.

All resultant HRA risk data by receptor may be found in the *Aera_CEQA_AQIAandHRA.zip* file in the Attachments section of this report.

10.0 RISK DRIVER POLLUTANTS

10.1 Cancer Risk

The primary cancer risk driver pollutants for the MEIR are particulate matter from diesel exhaust (i.e., diesel particulate matter or diesel PM) and PAHs. Diesel PM is emitted from stationary and mobile diesel fired-internal combustion engines. PAHs are primarily emitted from the steam generators and flare, with a small contribution from the natural gas-fired emergency generator.

The primary cancer risk drivers for the MEIW are diesel PM and epichlorohydrin. Epichlorohydrin is emitted from solvent operations. Epichlorohydrin is the primary cancer risk driver for the PMI.

Tables 10.1-1 through 10.1-3 show the risk driver pollutants for the cancer risk at the MEIR, MEIW and at the PMI, respectively. The analysis indicates that there is no significant cancer risk at any residential or worker receptor.

Table 10.1-1 Risk Driver¹ for Cancer Risk at MEIR – Receptor No. 3751

Pollutant	Cancer Risk by Pollutant (in a million)	Percent of Total Cancer Risk
Total Cancer Risk	9.12	100%
Diesel PM	5.22	57%
PAHs	2.51	27%
Arsenic	0.84	9%
Cadmium	0.25	3%
Benzene	0.19	2%

¹ Pollutants contributing less than one percent to the total risk or a risk of less than one in a million may not be included.

Table 10.1-2 Risk Driver² for Cancer Risk at MEIW – Receptor No. 1828

Pollutant	Cancer Risk by Pollutant (in a million)	Percent of Total Cancer Risk
Total Cancer Risk	1.41	100%
Diesel PM	0.56	40%
Epichlorohydrin	0.55	39%
Benzene	0.26	19%
Ethyl Benzene	0.02	1%

Table 10.1-3 Risk Driver² for Cancer Risk at PMI – Receptor No. 4873

Pollutant	Cancer Risk by Pollutant (in a million)	Percent of Total Cancer Risk
Total Cancer Risk	335.20	100%
Epichlorohydrin	291.47	87%
Diesel PM	25.06	7%
Benzene	14.30	4%
PAHs	2.47	0.7%
Ethyl Benzene	1.57	0.5%

10.2 Chronic Non-Cancer Risk

The MEIR chronic non-cancer risk driver pollutant is arsenic. The primary health endpoints for the chronic non-cancer MEIR are the respiratory system, cardiovascular system, central nervous system, reproductive and development system, and the skin. Arsenic is emitted from the steam generators and the flare.

The primary chronic non-cancer risk driver for both the MEIW and the PMI is epichlorohydrin. The primary health endpoints for both the chronic non-cancer MEIW and PMI are the respiratory system and the eyes.

Tables 10.2-1 through 10.2-3 show the risk driver pollutants for the chronic non-cancer risk at the MEIR, MEIW and at the PMI, respectively. The analysis indicates that there is no significant chronic non-cancer risk at any residential or worker receptor.

² Pollutants contributing less than one percent to the total risk or a risk of less than one in a million may not be included.

Table 10.2-1 Risk Driver³ Chronic Non-Cancer Risk at MEIR – Receptor No. 3751

Pollutant (Resp Endpoint)	Chronic Non-Cancer Risk by Pollutant	Percent of Total Risk
Total Chronic Non-Cancer Risk	7.40E-02	100%
Arsenic	6.57E-02	89%
Nickel	3.33E-03	4%
Hydrogen Sulfide	1.67E-03	2%
Diesel PM	1.40E-03	2%
Cadmium	1.22E-03	2%

Table 10.2-2 Risk Driver³ Chronic Non-Cancer Risk at MEIW – Receptor No. 1828

Pollutant (Resp Endpoint)	Chronic Non-Cancer Risk by Pollutant	Percent of Total Risk
Total Chronic Non-Cancer Risk	5.01E-02	100%
Epichlorohydrin	4.05E-02	81%
Arsenic	4.49E-03	9%
Diesel PM	1.81E-03	4%
Hydrogen Sulfide	1.32E-03	3%
Nickel	7.29E-04	1%

Table 10.2-3 Risk Driver³ Chronic Non-Cancer Risk at PMI – Receptor No. 4873

Pollutant (Resp Endpoint)	Chronic Non-Cancer Risk by Pollutant	Percent of Total Risk
Total Chronic Non-Cancer Risk	1.82E+00	100%
Epichlorohydrin	1.79E+00	98%
Arsenic	1.57E-02	1%

10.3 8-hr Chronic Non-Cancer Risk

Benzene is the primary risk driver for the 8-hour chronic non-cancer risk at both the PMI and MEIW. The primary health endpoint for both the PMI and MEIW is the hematologic system.

Tables 10.3-1 and 10.3-2 show the risk driver pollutants for the chronic non-cancer risk at the MEIW and at the PMI, respectively. The analysis indicates that there is no significant chronic 8-hour non-cancer risk projected off the property boundary.

³ Pollutants contributing less than one percent to the total risk are not included.

Table 10.3-1 Risk Driver⁴ 8-Hr Chronic Non-Cancer Risk at MEIW – Receptor No. 1828

Pollutant (Hematologic System Endpoint)	8-Hr Chronic Non-Cancer Risk by Pollutant	Percent of Total Risk
Total 8-Hr Chronic Non-Cancer Risk	1.54E-02	100%
Benzene	1.54E-02	100%

Table 10.3-2 Risk Driver⁴ 8-Hr Chronic Non-Cancer Risk at PMI – Receptor No. 4871

Pollutant (Hematologic System Endpoint)	8-Hr Chronic Non-Cancer Risk by Pollutant	Percent of Total Risk
Total 8-Hr Chronic Non-Cancer Risk	8.38E-02	100%
Benzene	8.38E-02	100%

10.4 Acute Non-Cancer Risk

Benzene is the primary risk driver for the acute non-cancer risk MEIR. The primary health endpoints are the immune system, reproductive and development system, and the hematologic system. Benzene is emitted throughout the facility from fugitive components, tanks, loading racks, solvent usage, wells and combustion equipment.

The primary risk driver at the MEIW and PMI for acute non-cancer risk is acrolein, with formaldehyde as a secondary risk driver. The primary health endpoints are the eyes and the respiratory system. Acrolein and formaldehyde are emitted from combustion equipment.

Tables 10.4-1 through 10.4-3 show the risk driver pollutants for the acute non-cancer risk at the MEIR, MEIW and at the PMI, respectively. The analysis indicates that no significant acute non-cancer risk is projected off the property boundary.

Table 10.4-1 Risk Driver⁴ Acute Non-Cancer Risk at MEIR – Receptor No. 1873

Pollutant (Immune Endpoint)	Acute Non-Cancer Risk by Pollutant	Percent of Total Risk
Total Acute Non-Cancer Risk	1.45E-01	100%
Benzene	1.36E-01	93%
Nickel	9.48E-03	7%

⁴ Pollutants contributing less than one percent to the total risk are not included.

Table 10.4-2 Risk Driver⁵ Acute Non-Cancer Risk at MEIW – Receptor No. 1818

Pollutant (Eyes Endpoint)	Acute Non-Cancer Risk by Pollutant	Percent of Total Risk
Total Acute Non-Cancer Risk	2.04E-01	100%
Acrolein	1.34E-01	66%
Formaldehyde	6.34E-2	31%
Epichlorohydrin	3.13E-03	2%
Isopropyl Alcohol	2.20E-03	1%

Table 10.4-3 Risk Driver⁵ Acute Non-Cancer Risk at PMI – Receptor No. 4910

Pollutant (Eyes Endpoint)	Acute Non-Cancer Risk by Pollutant	Percent of Total Risk
Total Acute Non-Cancer Risk	6.11E-01	100%
Acrolein	4.08E-01	67%
Formaldehyde	1.92E-01	31%

11.0 CONCLUSION

Per District guidelines, if a facility's toxic emissions result in a cancer risk equal to or greater than 10 in a million, it is considered a *significant risk* facility. For non-cancer risk, if a facility's toxic emissions result in a Hazard Index equal to or greater than 1.0, it is considered a *significant risk* facility. The risk assessment results show that the project at Aera Energy LLC - East Cat Canyon will not present a significant risk to the surrounding community.

12.0 REFERENCES

- Risk notification levels were adopted by the Santa Barbara County Air Pollution Control Board of Directors on June 1993. The risk notification levels were set at 10 per million for cancer risk and a Hazard Index of greater than 1.0 for non-cancer risk.
- Risk reduction thresholds were adopted by the Santa Barbara County Air Pollution Control Board of Directors on September 17, 1998. These risk reduction thresholds were set at the same level as public notification thresholds, i.e., 10 per million for cancer risk and a Hazard Index of greater than 1.0 for non-cancer risk.
- OEHHA. *Air Toxics Hot Spots Program: Risk Assessment Guidelines*. February 2015. http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf.
- Santa Barbara County Air Pollution Control District. *Modeling Guidelines for Health Risk Assessments*. May 2017. <http://www.ourair.org/wp-content/uploads/apcd-15i.pdf>.
- Santa Barbara County Air Pollution Control District. *Piston IC Engine Technical Reference Document*. November 2002. <http://www.ourair.org/wp-content/uploads/sbcapcdicerefdoc.pdf>.
- USEPA. *Table 1.4-4. Emission Factors for Metals from Natural Gas Combustion*. July 1998. <https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf>.

⁵ Pollutants contributing less than one percent to the total risk are not included.

- Aera Energy LLC. ATC 14624 application, *Application for Authorities to Construct East Cat Canyon Oil Field Redevelopment Project*, submitted April 17, 2015 (Revised September 9, 2015 and March 2016).
- Aera Energy LLC. *East Cat Canyon Oil Field Redevelopment Air Quality Impact Assessment*, prepared by Insight Environmental Consultants, February 2015 (Revised August 2015, March 2016, August 2017)
- Santa Barbara County Air Pollution Control District draft Health Risk Assessment Report for ATC 14624, *Health Risk Assessment Report: Aera Energy LLC – East Cat Canyon*.

13.0 ATTACHMENTS

- A1 – Residential Cancer Risk Isopleth: Entire Stationary Source View
- A2 – Residential Cancer Risk Isopleth: Magnified View
- B1 – Residential Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
- B2 – Residential Chronic Non-Cancer Risk Isopleth: Magnified View of PMI and MEIR
- B3 – Residential Chronic Non-Cancer Risk Isopleth: Magnified View of 1.0 Hazard Index Isopleth
- C1 – Worker Cancer Risk Isopleth: Entire Stationary Source View
- C2 – Worker Cancer Risk Isopleth: Magnified View
- D1 – Worker Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
- D2 – Worker Chronic Non-Cancer Risk Isopleth: Magnified View
- E1 – Worker 8-Hour Chronic Non-Cancer Risk Isopleth: Entire Stationary Source View
- E2 – Worker 8-Hour Chronic Non-Cancer Risk Isopleth: Magnified View
- F – Acute Non-Cancer Risk Isopleth

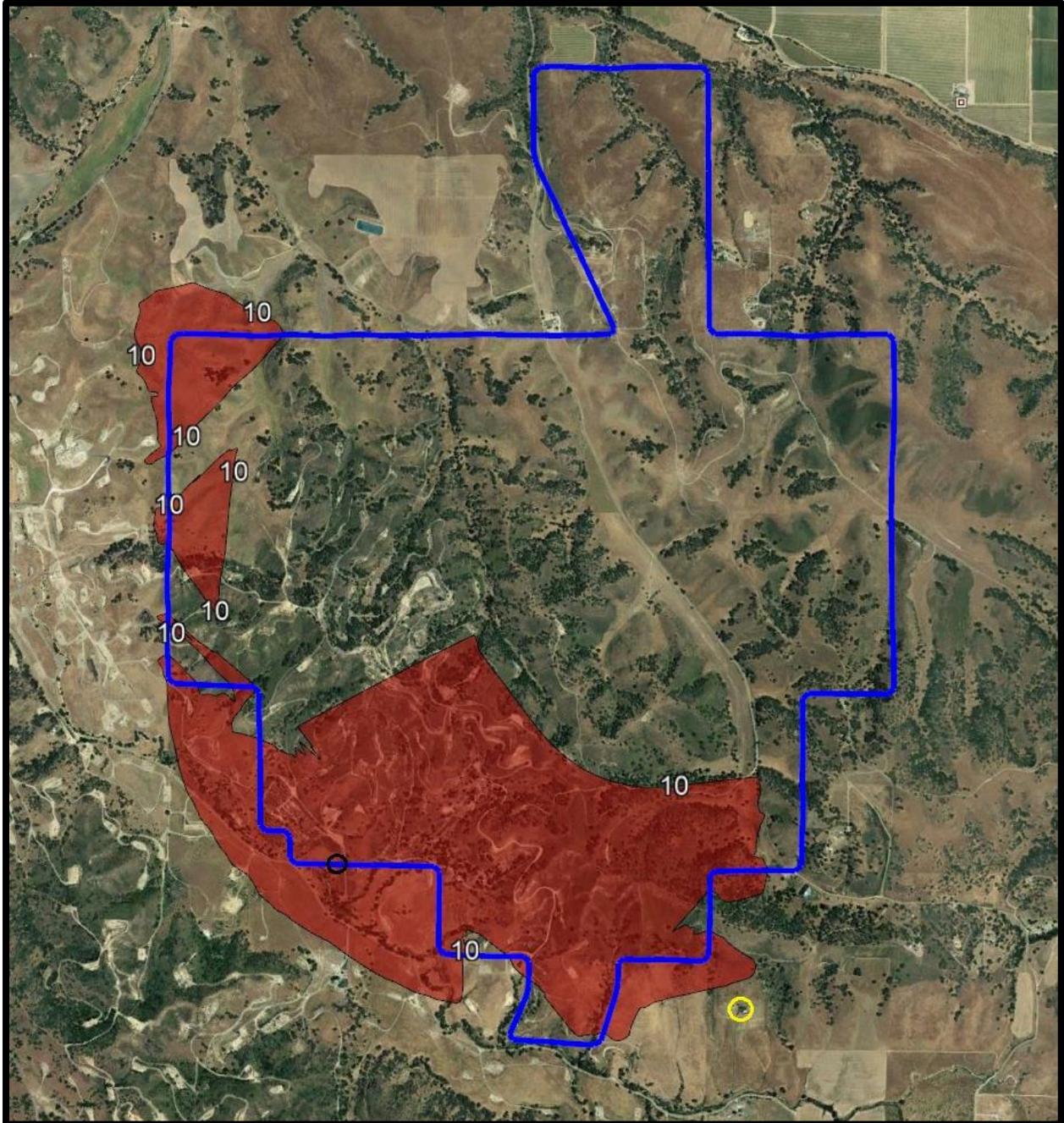
Emissions calculations and HRA input and output files may be found in the following location:

[\\sbcapcd.org\shares\Toxics\SourceFiles\SSID08811AeraEnergyLLC-EastCatCanyon\APCD_CEQA_HRAandAQIA\Aera_CEQA_AQIAandHRA.zip](https://sbcapcd.org/shares/Toxics/SourceFiles/SSID08811AeraEnergyLLC-EastCatCanyon/APCD_CEQA_HRAandAQIA/Aera_CEQA_AQIAandHRA.zip)

\\sbcapcd.org\shares\Toxics\SourceFiles\SSID08811AeraEnergyLLC-EastCatCanyon\APCD_CEQA_HRAandAQIA\HRA\Aera East Cat Canyon HRA Report for CEQA.docx

A1 – AERA EAST CAT CANYON

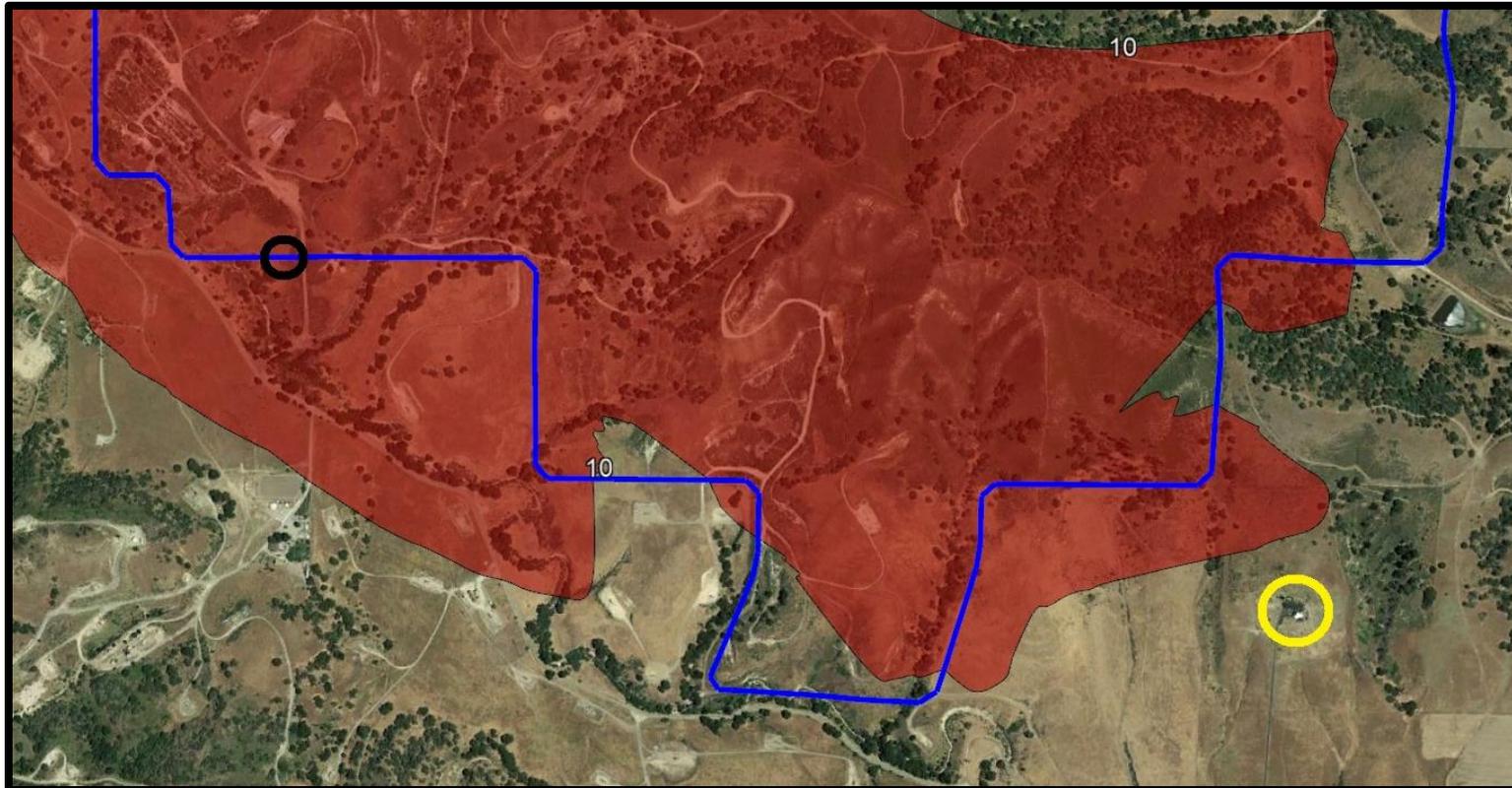
RESIDENTIAL CANCER RISK ISOPLETH
ENTIRE STATIONARY SOURCE VIEW



10 IN A MILLION RESIDENTIAL CANCER RISK ISOPLETH IN RED
PROPERTY BOUNDARY IN BLUE
PMI CIRCLED IN BLACK
MEIR CIRCLED IN YELLOW

A2 – AERA EAST CAT CANYON

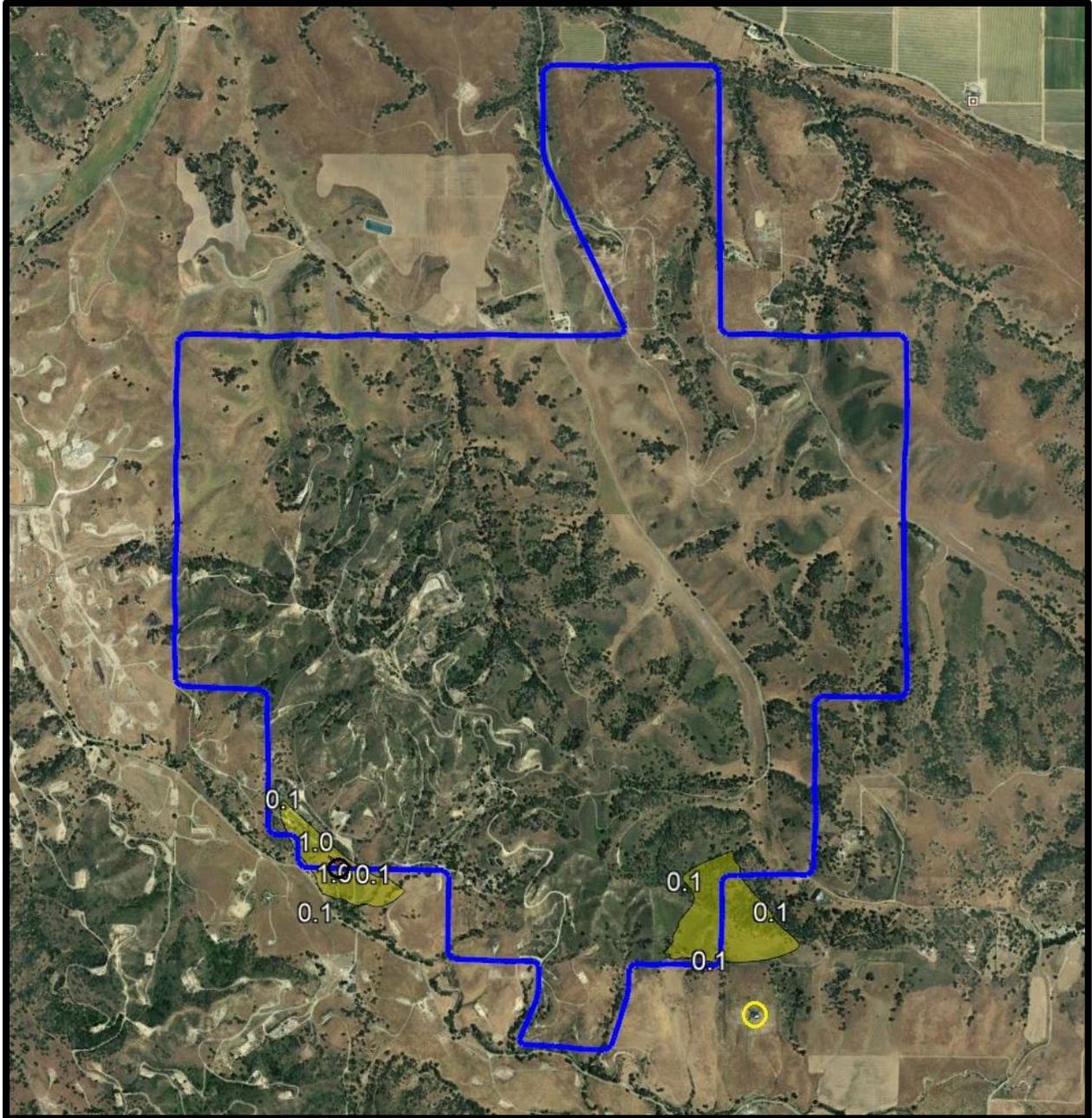
RESIDENTIAL CANCER RISK ISOPLETH MAGNIFIED VIEW



10 IN A MILLION RESIDENTIAL CANCER RISK ISOPLETH IN RED
PROPERTY BOUNDARY IN BLUE
PMI CIRCLED IN BLACK
MEIR CIRCLED IN YELLOW

B1 – AERA EAST CAT CANYON

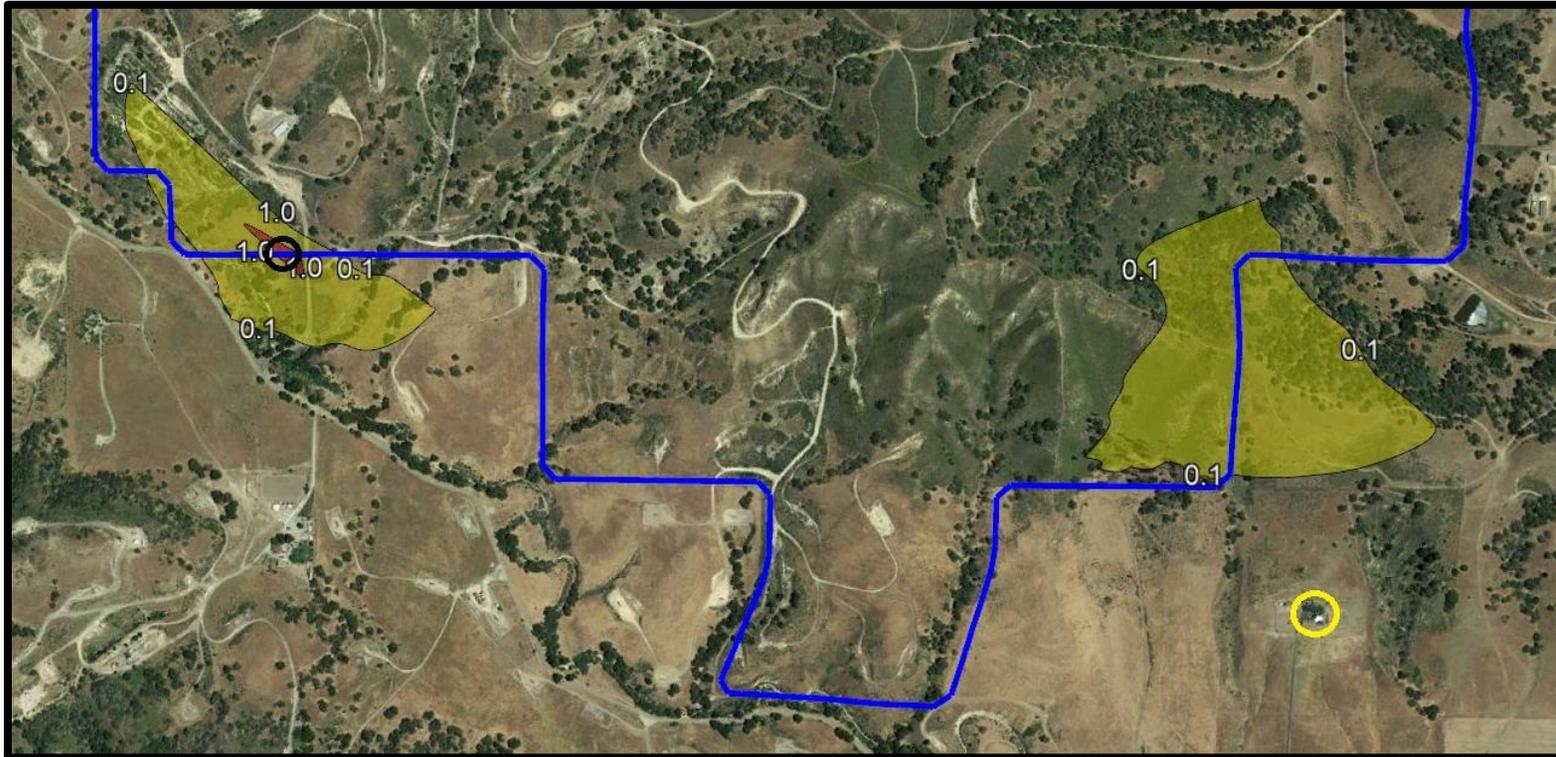
RESIDENTIAL CHRONIC NON-CANCER RISK ISOPLETH ENTIRE STATIONARY SOURCE VIEW



1.0 HAZARD INDEX ISOPLETH IN RED
0.1 HAZARD INDEX ISOPLETH IN YELLOW
PROPERTY BOUNDARY IN BLUE
PMI CIRCLED IN BLACK
MEIR CIRCLED IN YELLOW

B2 – AERA EAST CAT CANYON

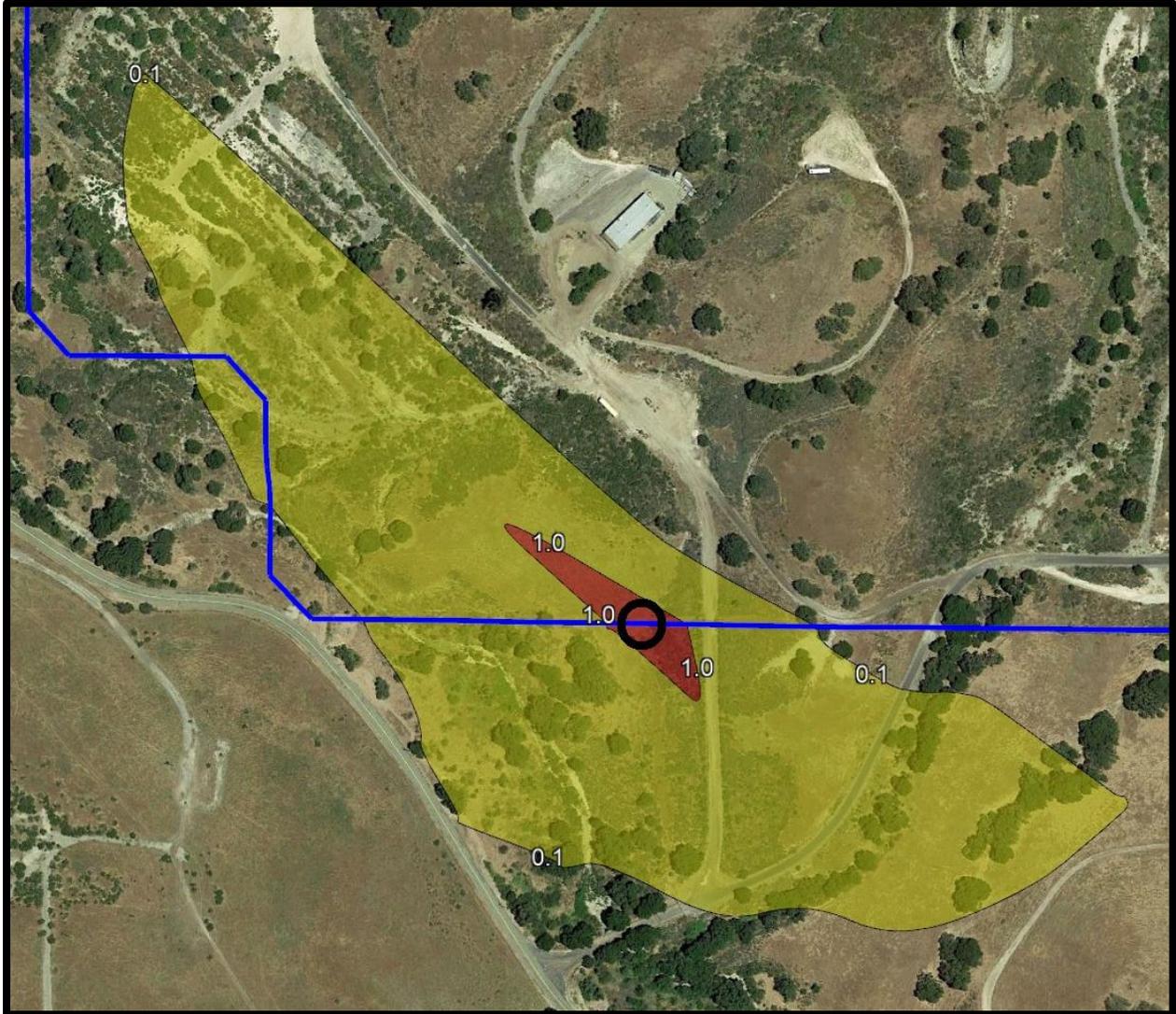
RESIDENTIAL CHRONIC NON-CANCER RISK ISOPLETH MAGNIFIED VIEW OF PMI AND MEIR



1.0 HAZARD INDEX ISOPLETH IN RED
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PROPERTY BOUNDARY IN BLUE
PMI CIRCLED IN BLACK
MEIR CIRCLED IN YELLOW

B3 – AERA EAST CAT CANYON

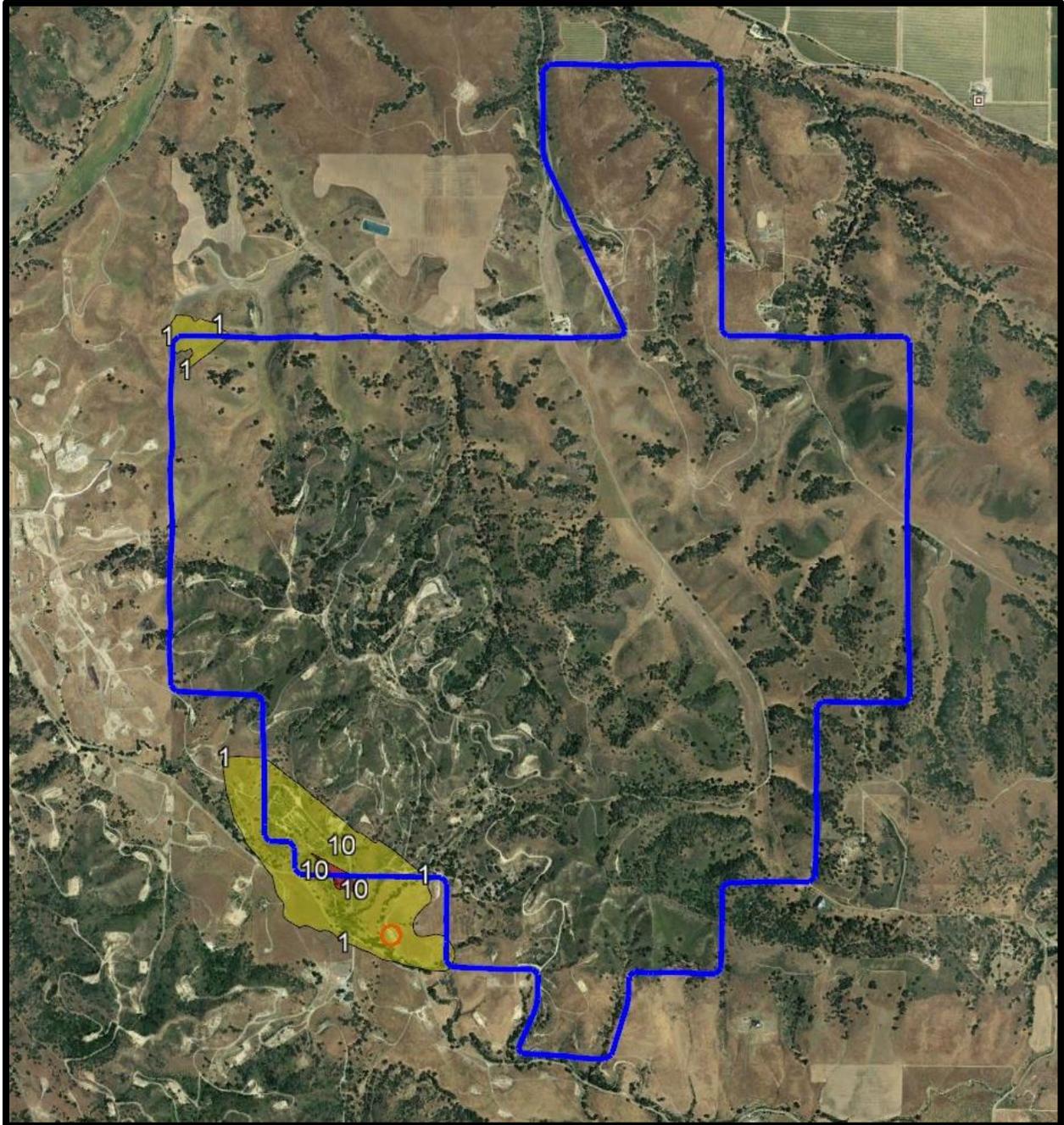
RESIDENTIAL CHRONIC NON-CANCER RISK ISOPLETH MAGNIFIED VIEW OF 1.0 HAZARD INDEX ISOPLETH



1.0 HAZARD INDEX ISOPLETH IN RED
0.1 HAZARD INDEX ISOPLETH IN YELLOW
PROPERTY BOUNDARY IN BLUE
PMI CIRCLED IN BLACK

C1 – AERA EAST CAT CANYON

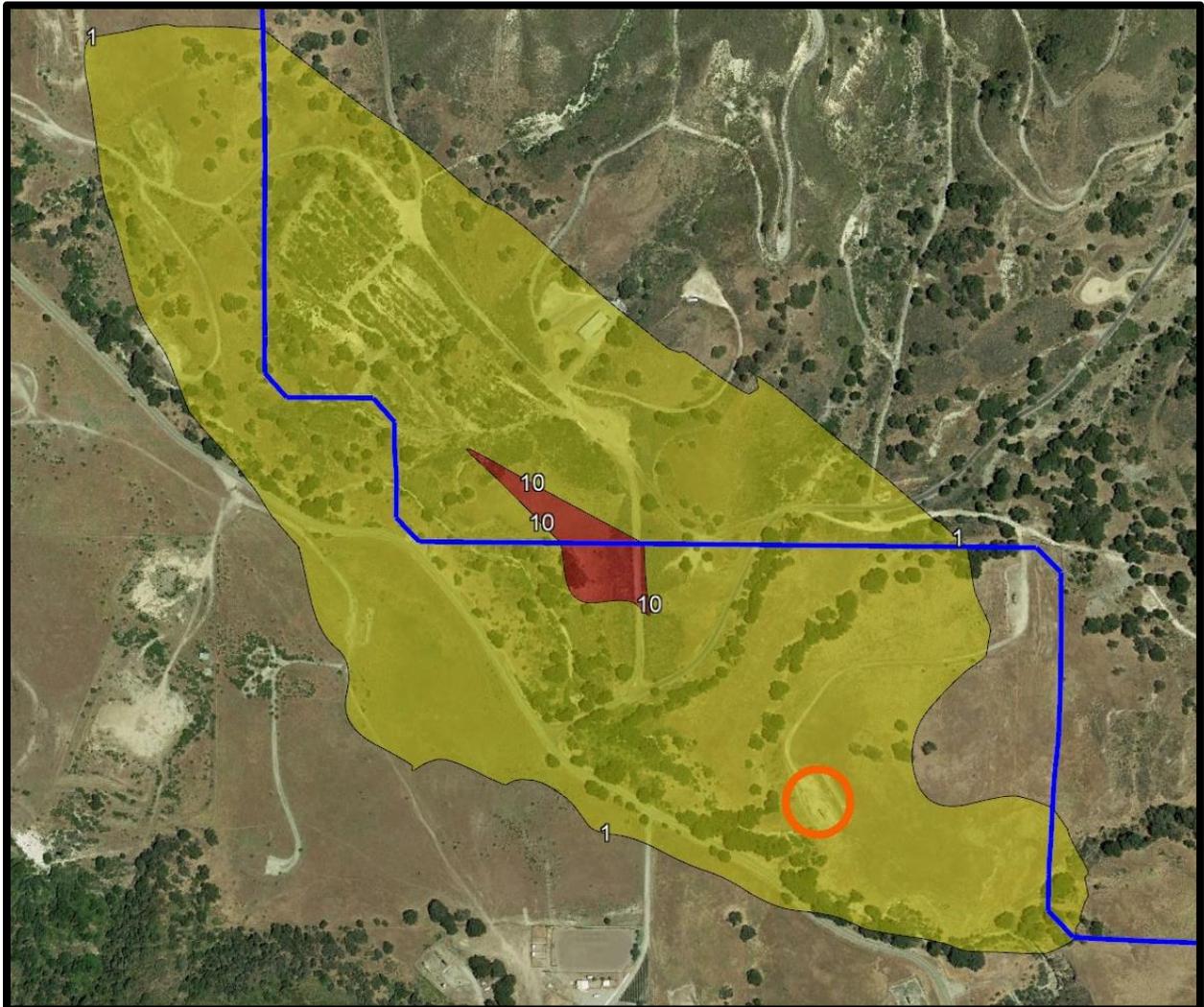
WORKER CANCER RISK ISOPLETH ENTIRE STATIONARY SOURCE VIEW



10 IN A MILLION WORKER CANCER RISK ISOPLETH IN RED
1 IN A MILLION WORKER CANCER RISK ISOPLETH IN YELLOW
PROPERTY BOUNDARY IN BLUE
MEIW CIRCLED IN ORANGE

C2 – AERA EAST CAT CANYON

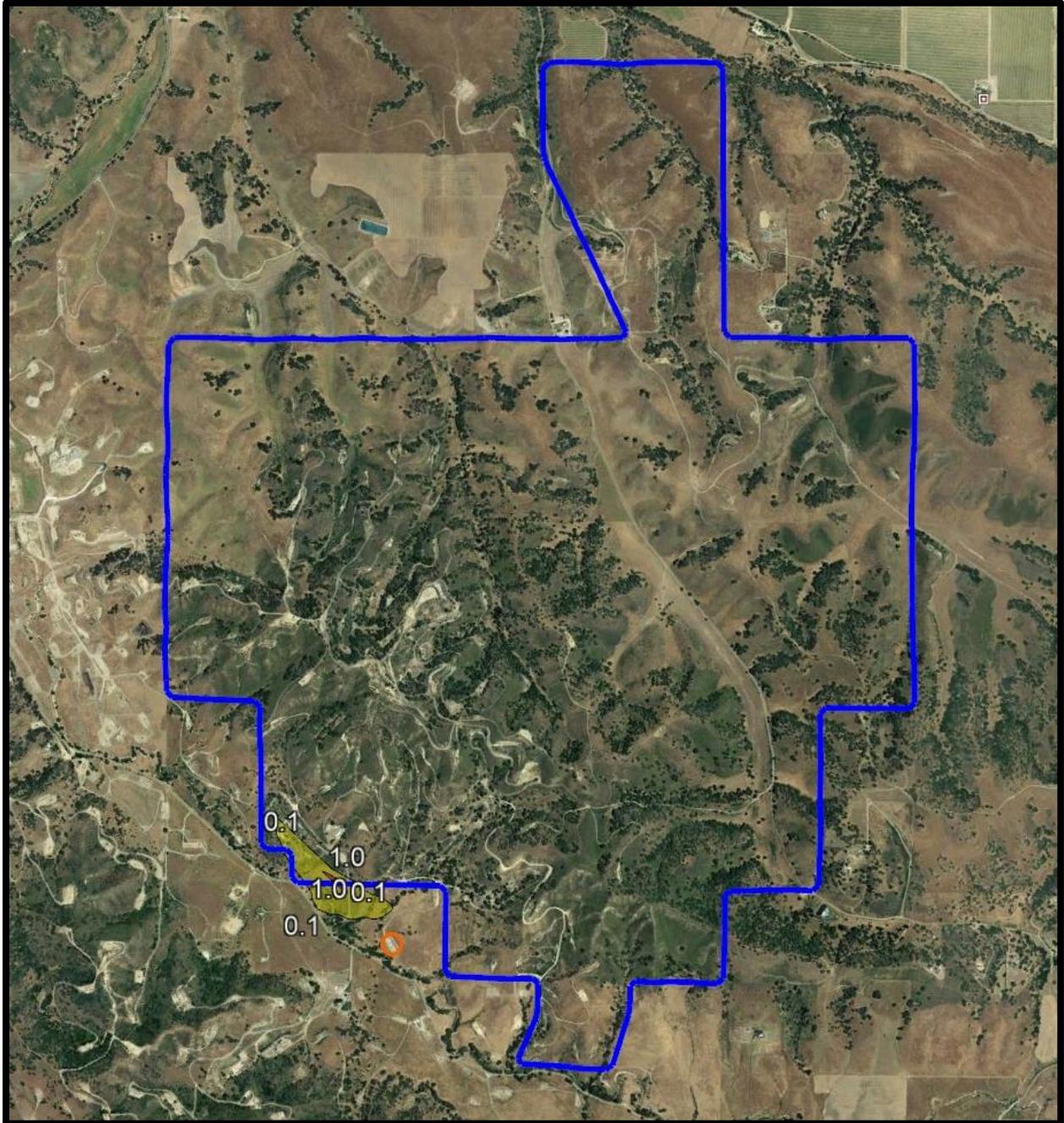
WORKER CANCER RISK ISOPLETH MAGNIFIED VIEW



10 IN A MILLION WORKER CANCER RISK ISOPLETH IN RED
1 IN A MILLION WORKER CANCER RISK ISOPLETH IN YELLOW
PROPERTY BOUNDARY IN BLUE
MEIW CIRCLED IN ORANGE

D1 – AERA EAST CAT CANYON

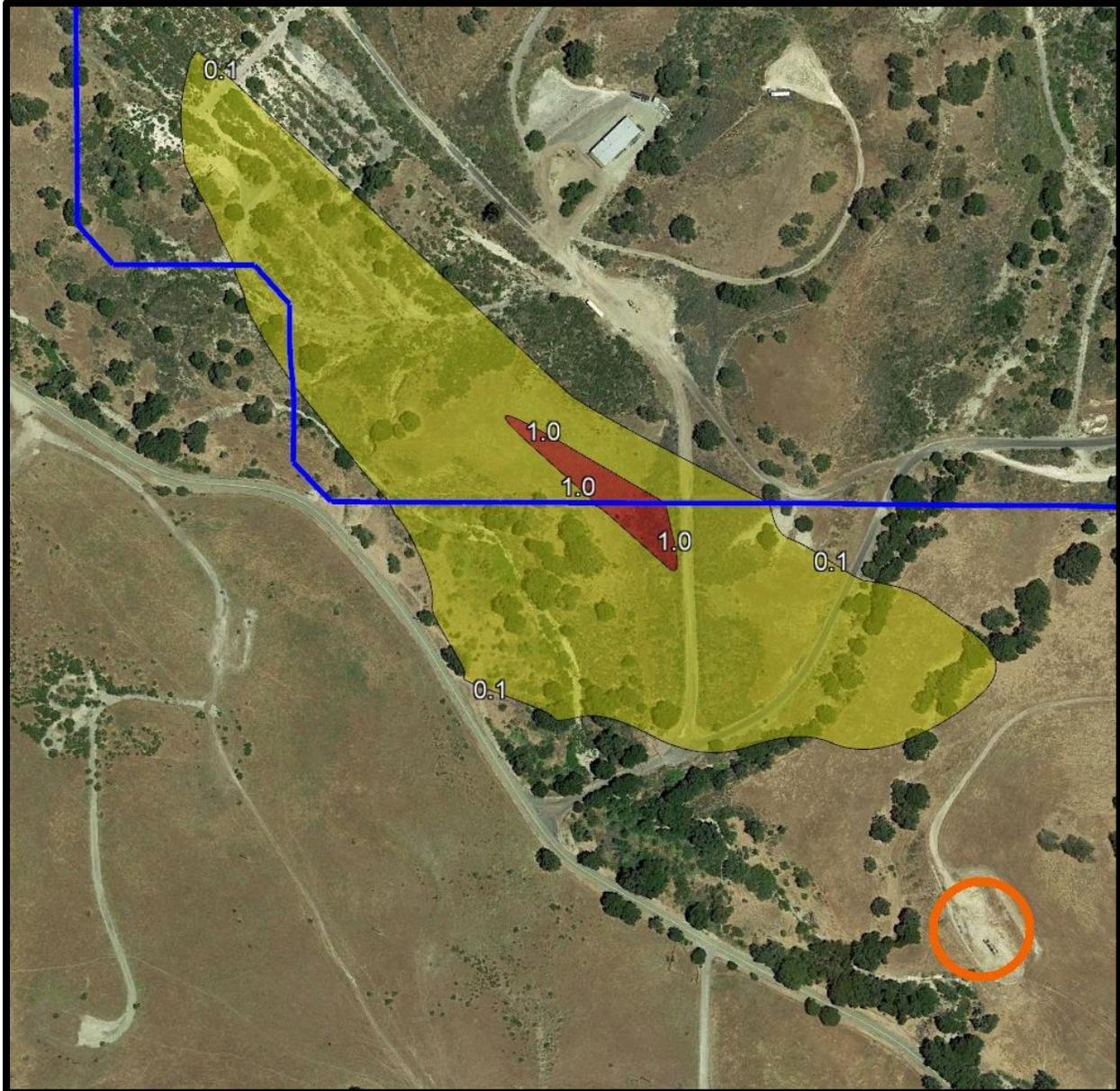
WORKER CHRONIC NON-CANCER RISK ISOPLETH ENTIRE STATIONARY SOURCE VIEW



1.0 HAZARD INDEX ISOPLETH IN RED
0.1 HAZARD INDEX ISOPLETH IN YELLOW
PROPERTY BOUNDARY IN BLUE
MEIW CIRCLED IN ORANGE

D2 – AERA EAST CAT CANYON

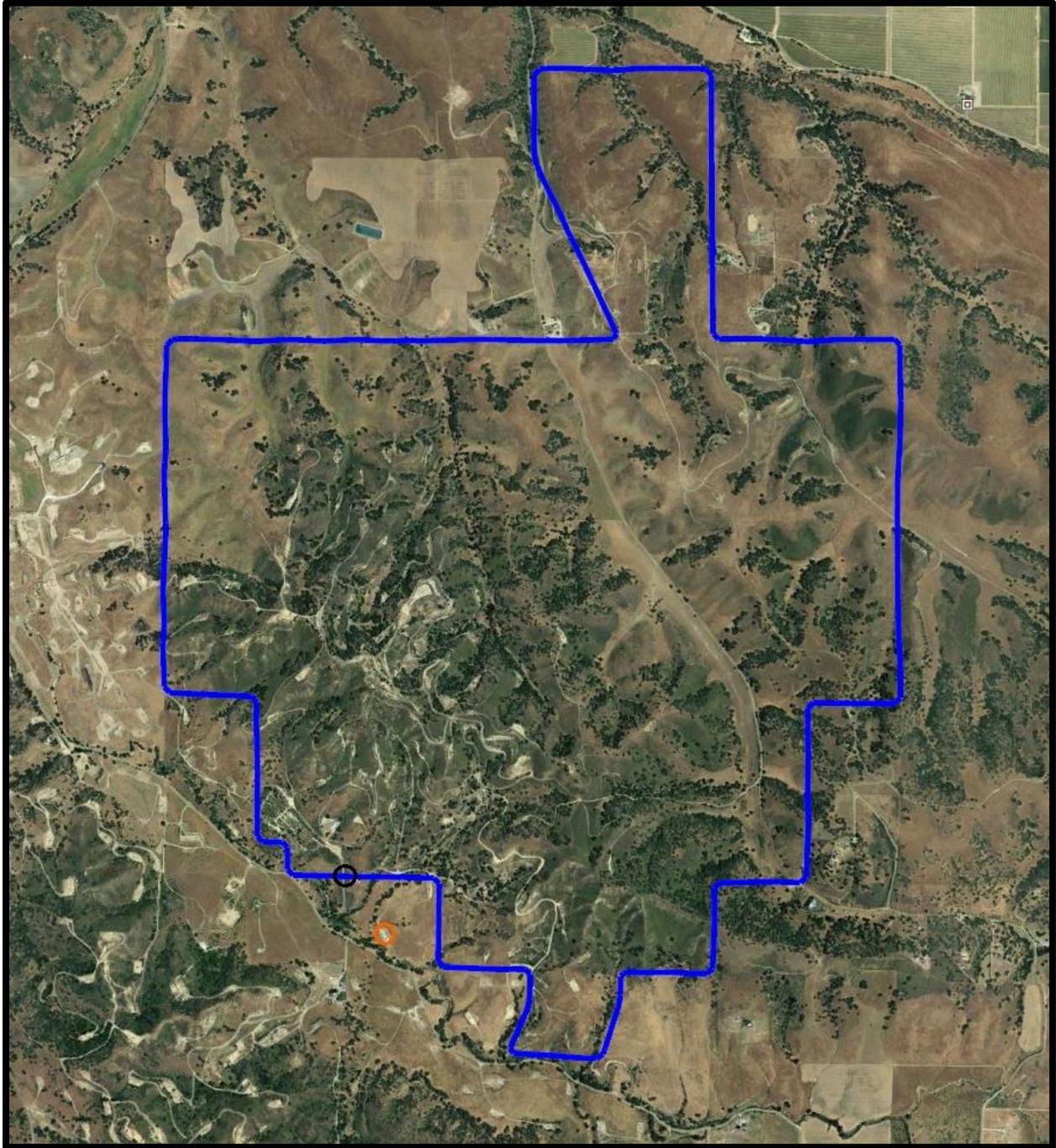
WORKER CHRONIC NON-CANCER RISK ISOPLETH MAGNIFIED VIEW



1.0 HAZARD INDEX ISOPLETH IN RED
0.1 HAZARD INDEX ISOPLETH IN YELLOW
PROPERTY BOUNDARY IN BLUE
MEIW CIRCLED IN ORANGE

E1 – AERA EAST CAT CANYON

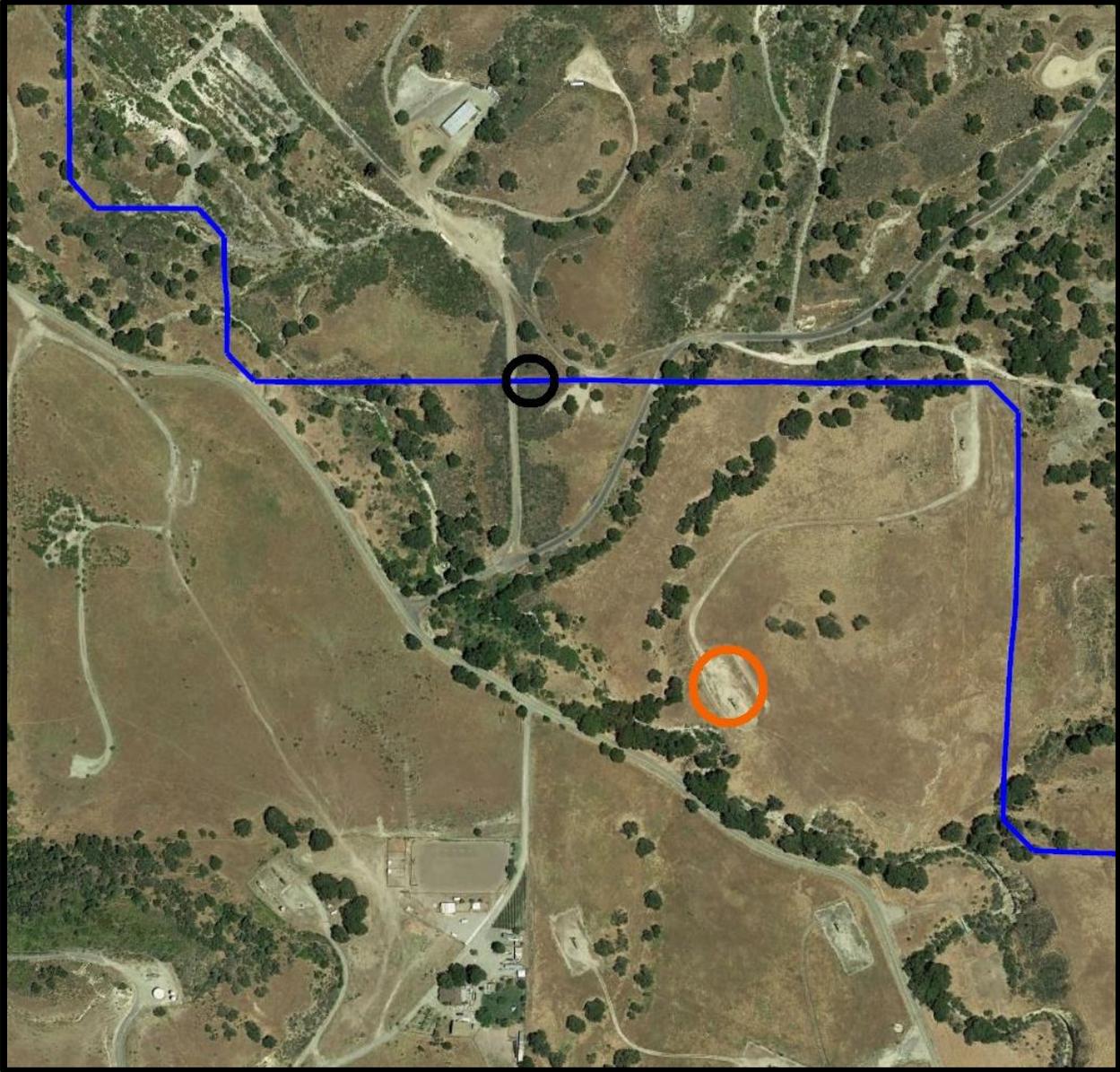
WORKER 8-HOUR CHRONIC NON-CANCER RISK ISOPLETH
ENTIRE STATIONARY SOURCE VIEW



PROPERTY BOUNDARY IN BLUE
PMI CIRCLED IN BLACK
MEIW CIRCLED IN ORANGE

E2 – AERA EAST CAT CANYON

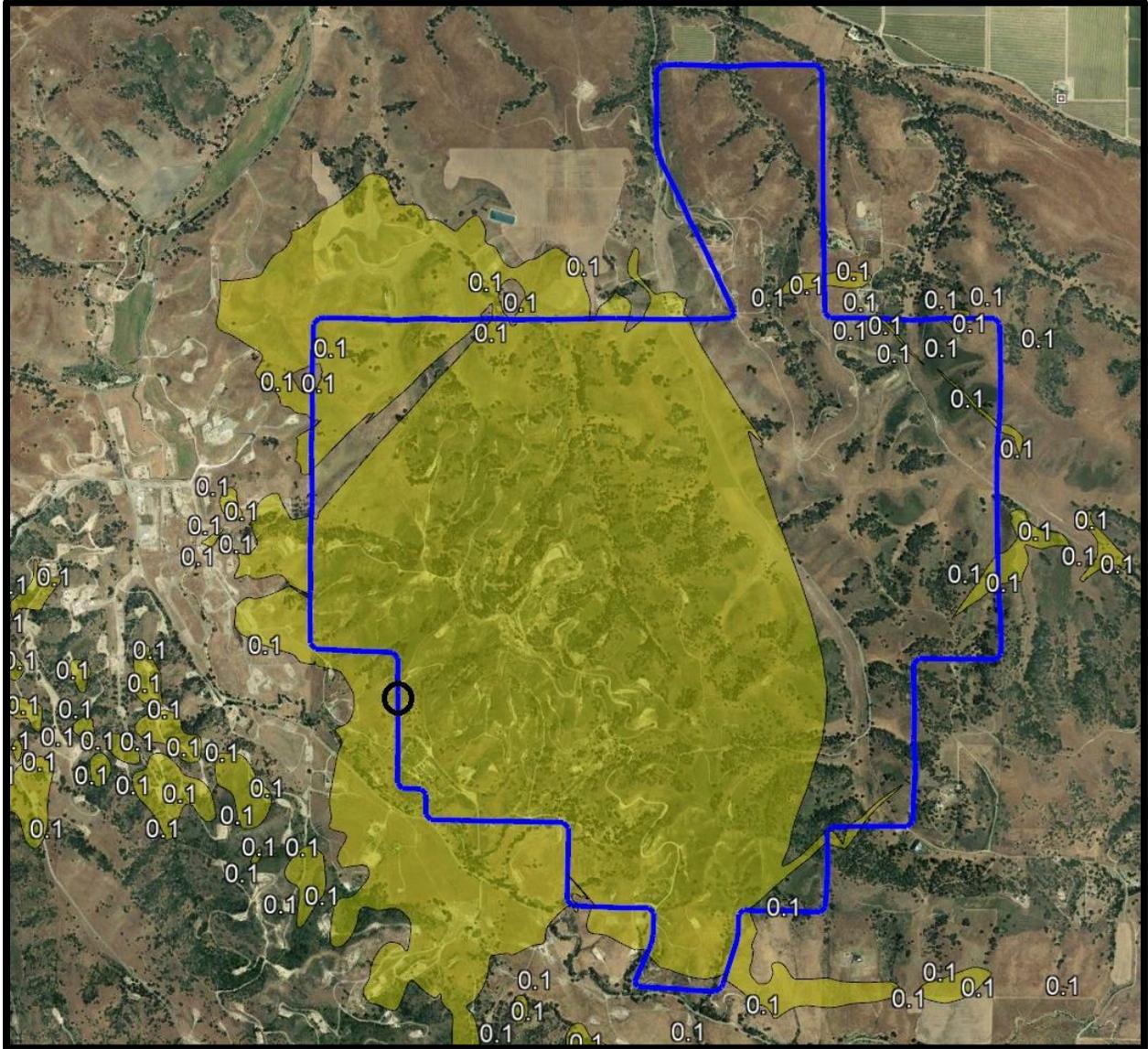
WORKER 8-HOUR CHRONIC NON-CANCER RISK ISOPLETH
MAGNIFIED VIEW



PROPERTY BOUNDARY IN BLUE
PMI CIRCLED IN BLACK
MEIW CIRCLED IN ORANGE

F – AERA EAST CAT CANYON

ACUTE NON-CANCER RISK ISOPLETH



0.1 HAZARD INDEX ISOPLETH IN YELLOW
PROPERTY BOUNDARY IN BLUE
PMI CIRCLED IN BLACK

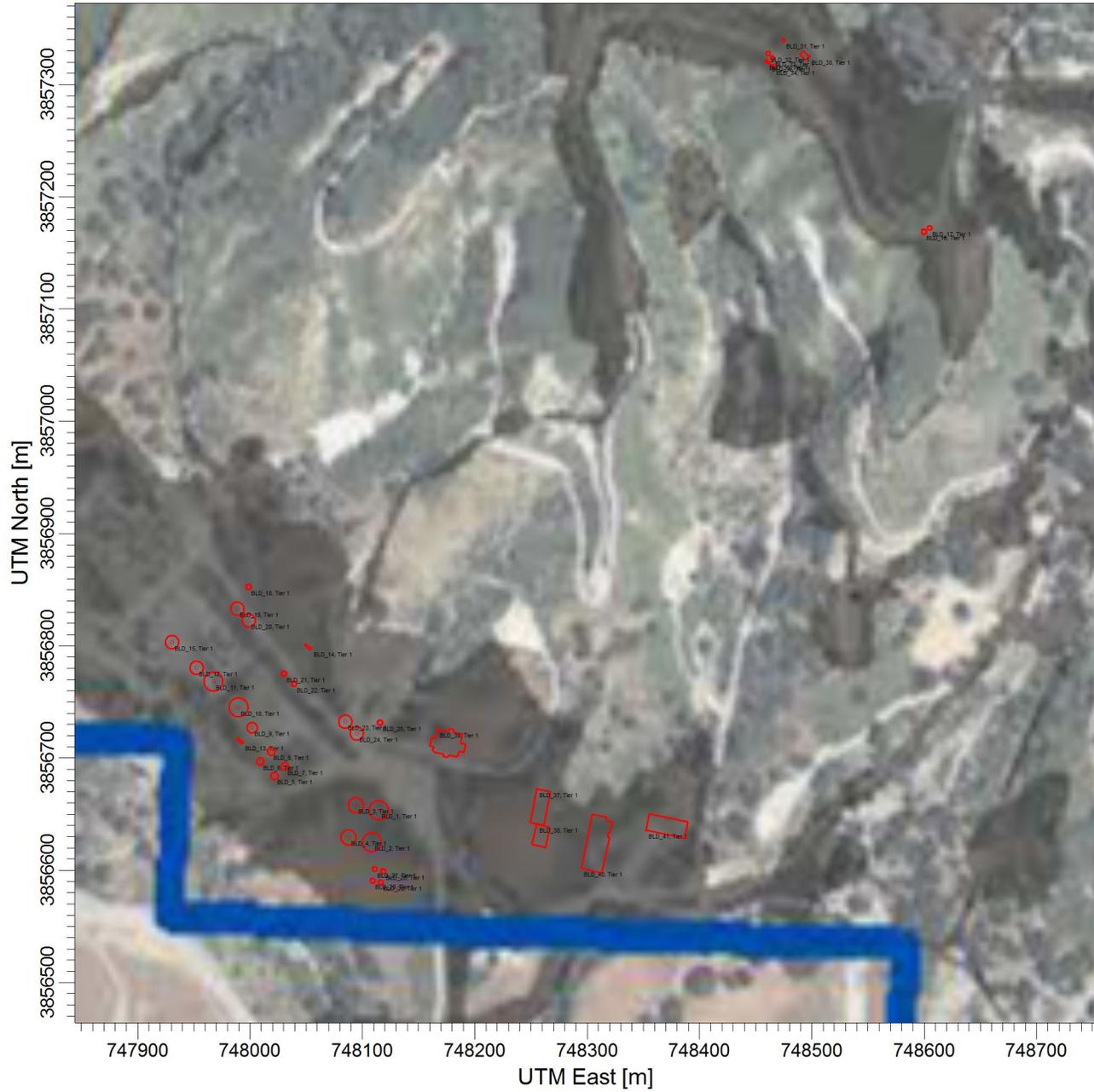
HRA Figures

(Not Part of Santa Barbara County Air Pollution Control Districts HRA)

- Buildings and Structures (Figure C-1)
 - All Sources (Figures C-2)
- Central Processing Facility Sources (Figure C-3)
- Project Boundary Coordinate Points (Figure C-4)

PROJECT TITLE:

**AERA SBECC
Buildings and Structures**



COMMENTS:

SOURCES:

159

RECEPTORS:

3834

SCALE:

1:5,714

0



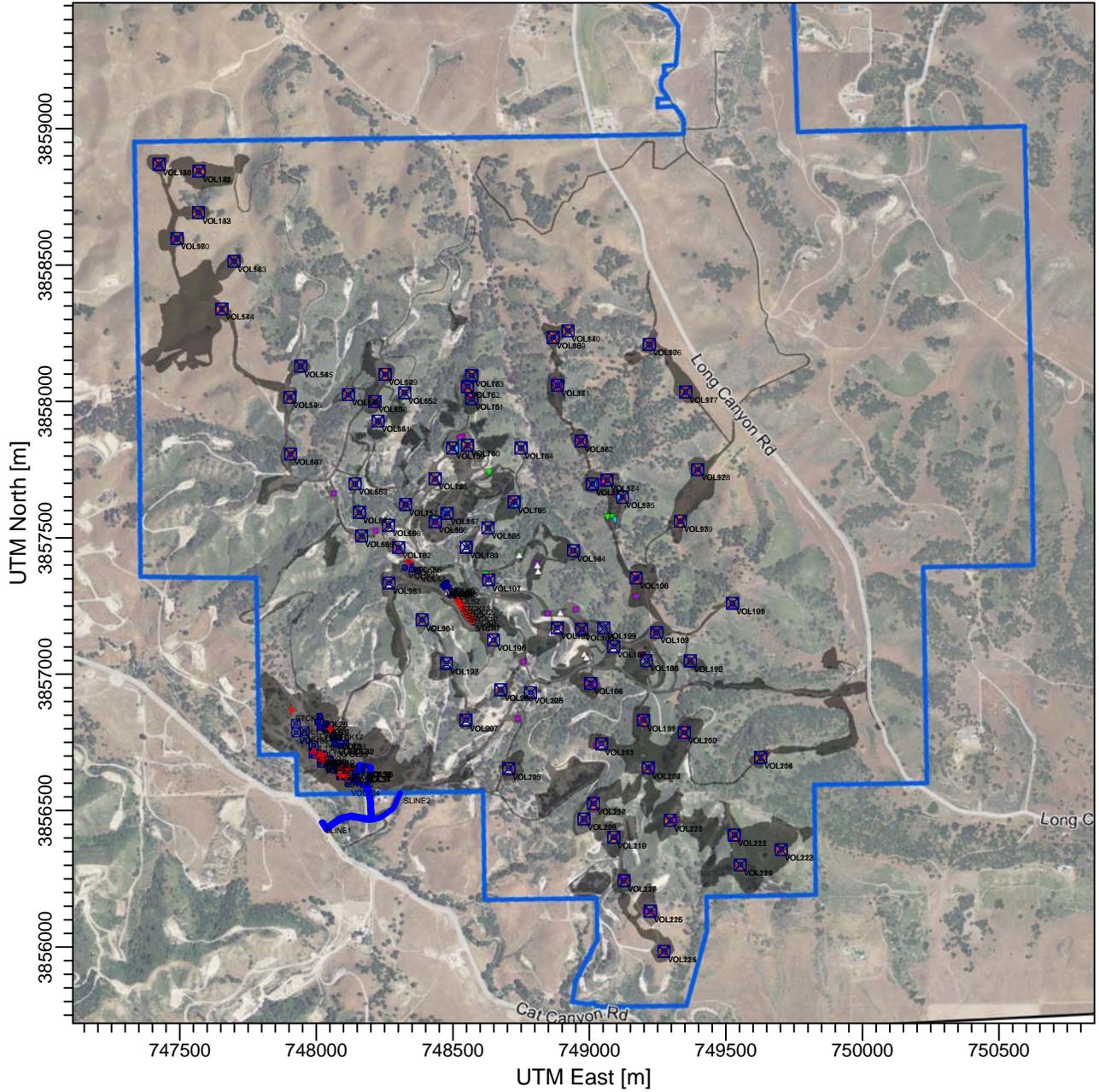
0.2 km

FIGURE NO.:

HRA Figure J-1

PROJECT TITLE:

**AERA SBECC
All Sources**



SOURCES:

238

RECEPTORS:

' , ''

SCALE:

1:23,516

0  0.5 km

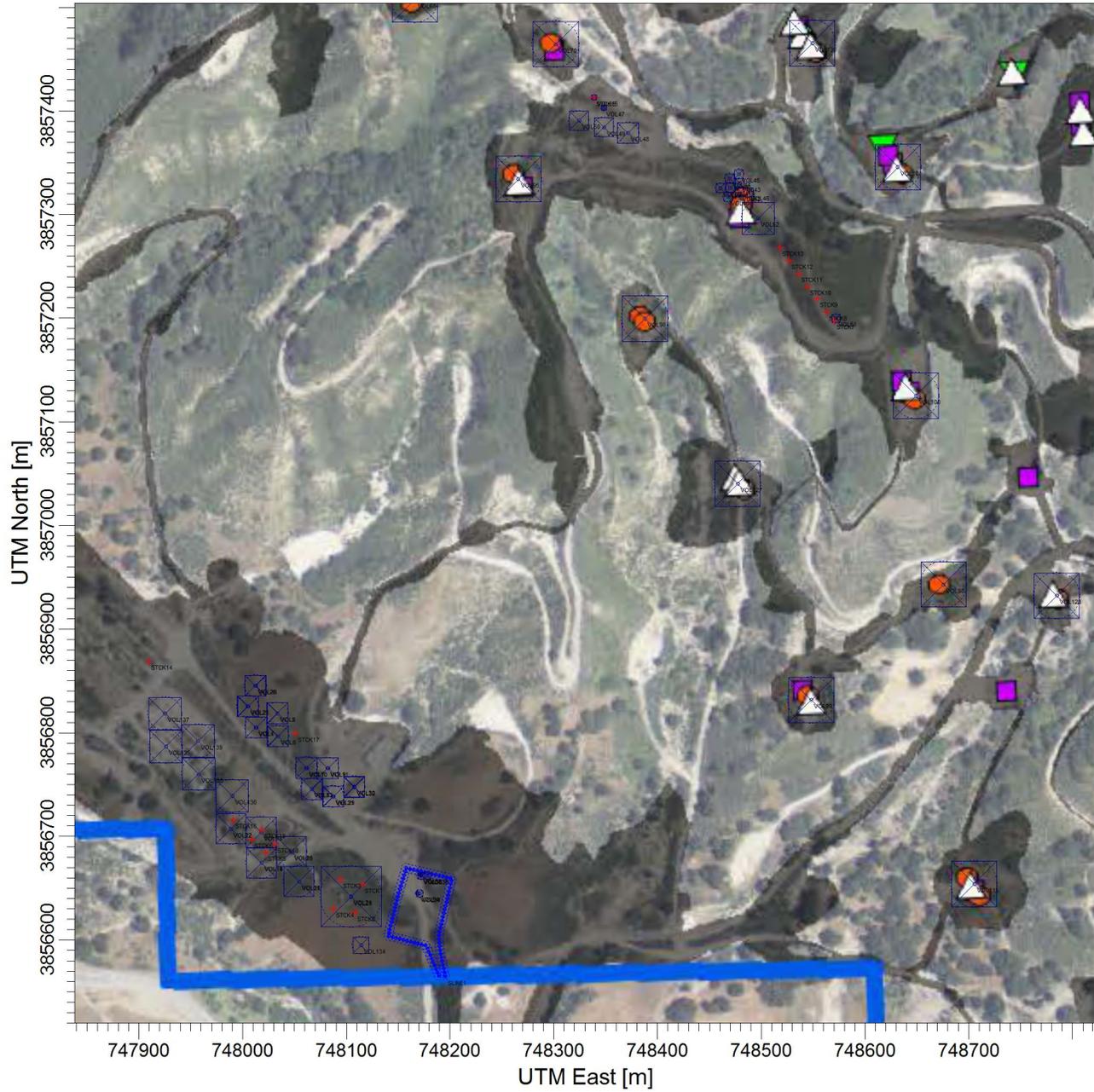
FIGURE NO.:

HRA Figure C-2

PROJECT TITLE:

AERA SBECC

Central Processing Facility Sources



COMMENTS:

SOURCES:

159

RECEPTORS:

3834

SCALE:

1:6,189

0  0.2 km

FIGURE NO.:

HRA Figure J-3

Project Title:

AERA SBECC

Project Boundary Coordinate Points

Point #	WGS84 Zone 10 North	
	Easting	Northing
1	749759.45	3858988.87
2	750589.47	3859006.10
3	750623.49	3857404.14
4	750219.46	3857393.03
5	750232.96	3856602.40
6	749820.69	3856592.10
7	749827.24	3856193.76
8	749425.85	3856185.32
9	749427.41	3856058.97
10	749354.00	3855788.68
11	748935.23	3855800.36
12	749026.99	3856033.94
13	749025.32	3856182.43
14	748615.77	3856180.47
15	748609.36	3856571.77
16	747927.64	3856558.78
17	747925.57	3856706.22
18	747791.81	3856705.53
19	747779.62	3857354.26
20	747356.53	3857358.46
21	747335.03	3858948.83
22	749342.55	3858980.92
23	748947.32	3859777.11
24	748936.45	3860178.00
25	749725.03	3860202.99

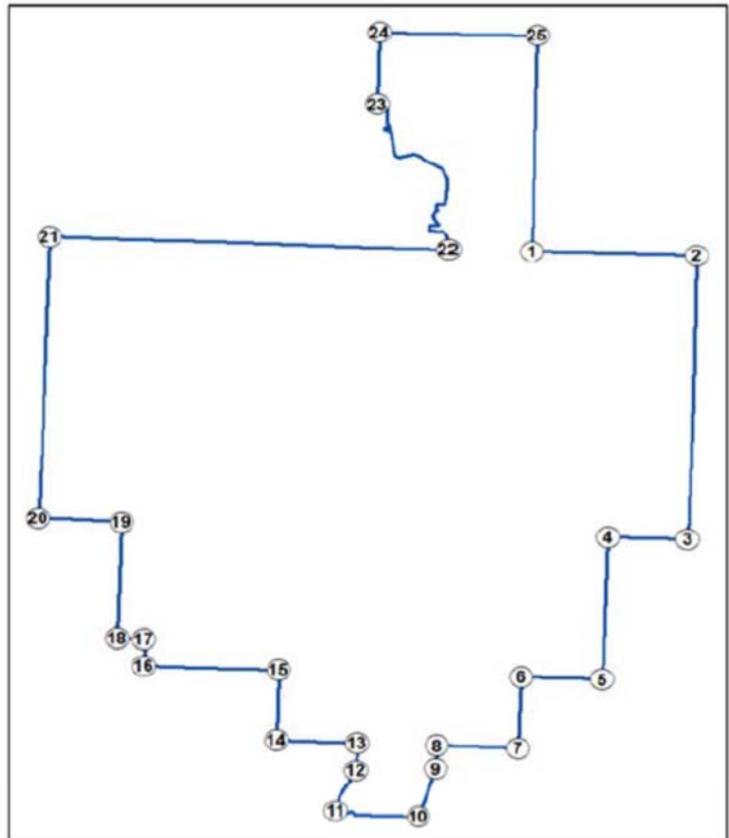


Figure No:

HRA Figure J-9

""Vqzk'Go kukpu'c'pf Modeling Files

(Electronic Files)

ATTACHMENT D

**Santa Barbara County Air Pollution Control District's
Ambient Air Quality Analysis**



Air Quality Impact Analysis Report

Aera Energy LLC
East Cat Canyon
6516 Cat Canyon Road
Santa Maria, CA 93454

East Cat Canyon Oil Field Redevelopment Project California Environmental Quality Act

Santa Barbara County Air Pollution Control District
260 North San Antonio Road, Suite A
Santa Barbara, CA 93110-1315

October 2017

1.0 Summary

The Santa Barbara County Air Pollution Control District (District) conducted an Air Quality Impact Analysis (AQIA) for Aera Energy LLC for their East Cat Canyon Oil Field Redevelopment Project under the California Environmental Quality Act (CEQA). The AQIA was completed using Lakes AERMOD View, Version 9.5.0. Aera Energy LLC (“Aera”) submitted the AQIA for the project, and the District revised the modeling and completed the final AQIA and report in order to expedite the CEQA process. Offsite CO, NO₂, SO₂, PM₁₀, and PM_{2.5} ground level concentration values were modeled and combined with the ambient background concentrations. Total concentrations were then compared to the Ambient Air Quality Standards specified in Table 1 of District Rule 805. The maximum calculated concentrations are shown in Section 9.

2.0 Background

2.1 Project Overview

Aera’s East Cat Canyon Oil Field Redevelopment Project will re-establish oil production in an existing field in which oil operations began over 100 years ago. Project plans include construction and restoration of well pads, construction and restoration of field access roads, and drilling of 296 wells including oil/gas production wells, steam injection wells, observation wells, water production wells, water injection wells, and fresh groundwater wells. In addition, new processing facilities and field systems will be constructed.

Aera submitted an application package to the County of Santa Barbara Planning and Development (P&D) to request approval of an Oil and Gas Drilling/Production Plan to reestablish oil production within the Brooks sand (reservoir) underlying the Cat Canyon Oil Field. P&D is the lead agency under the CEQA. The District is a responsible agency under CEQA.

Aera submitted a permit application to the District for this project under Authority to Construct (ATC) No. 14624. The District completed an AQIA for the ATC 14624. However, the ATC will not be issued until the CEQA process is complete and the lead agency issues their permit. The results of the AQIA for ATC 14624 are summarized in the draft document *Air Quality Impact Analysis Report: Aera Energy LLC East Cat Canyon ATC 14624*, which is found in the References section of this report.

The AQIA discussed in this report is for CEQA, which includes all the emissions modeled in the AQIA for the District’s permit, plus emissions from vehicles, ongoing maintenance and operation (O&M) activities, well drilling and fugitive dust.

2.2 Previous Air Quality Impact Analysis Submittals

On July 24, 2017, Aera submitted the CEQA AQIA and Health Risk Assessment (HRA) files. In August 2017, Aera submitted the CEQA document titled *East Cat Canyon Oil Field Redevelopment Air Quality Impact Assessment* to the District. Aera provided two additional submittals of emission calculation spreadsheets on September 6 and 25, 2017 in response to questions from the District on the calculation methodology. These submittals are included in the *Aera_CEQA_AQIAandHRA.zip* file in the Attachments section of this report.

Aera submitted an application document for ATC No. 14624 on April 17, 2015, which included the initial Air Quality Impact Analysis (AQIA) and Health Risk Assessment (HRA), titled *Application for Authorities to Construct East Cat Canyon Oil Field Redevelopment Project*. The AQIA was done using US EPA Industrial Source Complex – Short Term Model (ISC). The HRA was done using ISC and HARP1. The District deemed the application incomplete on May 13, 2015. Among many incompleteness issues were the AQIA and HRA, including the need for the dispersion modeling to be done in AERMOD and the risk assessment to be done in HARP2.

On September 9, 2015, Aera submitted a revised AQIA and HRA based on the Districts comments from May 13, 2015. The District found additional discrepancies and deemed the application incomplete on October 16, 2015. Aera addressed these comments and submitted their final AQIA and HRA in March 2016. The District reviewed the AQIA, revised the modeling and emission calculations, and then performed the revised AQIA for the project in order to expedite the permitting process. All of the documents discussed in this section may be found in the References section of this report.

3.0 Facility Information

EQUIPMENT OWNER/OPERATOR: Aera Energy LLC

SOURCE IDENTIFICATION NUMBER: 08811

EQUIPMENT LOCATION: 6516 Cat Canyon Road, Santa Maria, CA 93454

FACILITY UTM COORDINATES: Aera provided the UTM coordinates of the facility’s property boundaries, buildings, emission release points, and receptor locations.

UTM Zone 10
Easting: 749000 m
Northing: 3858000 m
Datum: WGS84

EQUIPMENT DESCRIPTION: The AQIA includes emissions from numerous pieces of equipment at 90 different emission points. This includes emissions from a flare, an internal combustion engine, steam generators, tanks, loading racks, wells, fugitive emissions from components, fugitive dust, vehicles and other mobile equipment.

4.0 Stack and Modeling Parameters (a.k.a. Emission Release Points)

All source modeling parameters for equipment included in the ATC AQIA were unchanged for this AQIA. Table 4.1 describes the sources modeled in the CEQA AQIA that were *not* modeled in the ATC AQIA. Emissions from vehicles operating within 1,000 feet of the property boundary were included in the CEQA AQIA.

Table 4.1 – CEQA-Only Modeling Sources

Source ID	Description
SLINE1	Emissions from diesel trucks traveling from off-site to the main plant area within the facility
SLINE2	Vehicle emissions associated with operations and maintenance, including drilling, outside of the property boundary
SLINE3	Vehicle emissions associated with employee travel
VOL140-217	Emissions from diesel-fired equipment used to drill wells, emissions from drilling muds at each well pad and fugitive dust

The stack location UTM coordinates and modeling parameters used in the dispersion modeling for the AQIA are found in the file *Aera_CEQA_AQIA.ADO* and in the .xlsx files for each pollutant and averaging

period with the prefix *Aera_CEQA_AQIA_Sources* (e.g., *Aera_CEQA_AQIA_Sources_CO1hr.xlsx*, *Aera_CEQA_AQIA_Sources_CO8hr.xlsx*, etc.), located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachment section of this report. All UTM coordinates in this report are in Zone 10 and the datum is WGS84.

5.0 Emissions

Aera provided emission calculations for both permitted equipment and permit-exempt equipment. The District reviewed the calculations and made revisions as necessary. The revisions are discussed in Section 5.1 and 5.2 below.

5.1 Revisions to Emission Calculations for Permitted Equipment

For the proposed project equipment and operations, both hourly and annual emissions were calculated based on maximum potential to emit for the equipment. Detailed calculations for the project's permitted emissions may be found in *AAQA Tables ATC_03062016 (Revised by APCD).xlsx* located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachment section of this report.

The District modified the emissions by making the following changes:

1. External Combustion. The District made some minor revisions to emissions based on increasing decimal places within the calculations. Specifically, additional decimal places were used directly from the boiler spreadsheet, *boiler6*, for the 85 MMBtu/hr steam generators and the 62.5 MMBtu/hr steam generator.
2. Generator. The District made corrections to emission calculations for the 1126 bhp natural gas-fired generator (Source ID STCK14).
 - a. The NO_x factor was corrected to be based on the manufacturer guarantee of 5 ppmv @ 15% O₂ (0.0185 lb/MMBtu). It was converted to g/bhp-hr using the fuel factor of 8360 Btu/bhp-hr (with a ratio of 1.1 applied for the HHV) found in the manufacturer's specifications.
 - b. The PM and PM₁₀ emissions were changed to be based on EPA's AP-42 Section 3.2 emission factor for 4 stroke rich burn, natural gas fired engines. This factor is listed as 0.0095 lb/MMBtu. It was converted to g/bhp-hr using the fuel factor of 8360 Btu/bhp-hr (with a ratio of 1.1 applied for the HHV) found in the manufacturer's specifications.
 - c. The SO_x emissions were incorrectly based on 19 ppmv. The calculations were revised to 16 ppmv to be consistent with the rest of the application for PUC natural gas.

5.2 Revisions to Emission Calculations for CEQA-Only Emissions (Permit-Exempt Emissions)

Detailed calculations for the project's permit-exempt emissions are located in the *AQIA Emission Calculations for SLINE1-3_with APCD Revisions.xlsx* and *AQIA Emission Calculations for VOL140_217_Drilling_Fugitive Dust_OandM Mobile.xlsx* located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachment section of this report.

The District modified Aera's emission spreadsheets by making the following changes:

1. Well Pad Emissions. The District made revisions to the volume sources at each well pad (Source IDs VOL140 through VOL217).

- a. Aera calculated an annual average emission rate for combustion emissions from drilling. Because each averaging period for the AQIA is one year or less, the District considered the peak year on a pollutant by pollutant basis for all emissions from sources VOL140-217. The District used the emissions from the year 2024 for NO_x, CO and SO_x; the emissions from 2029 were used for modeling PM₁₀ and PM_{2.5}.
 - b. Aera's emission calculation spreadsheet stated that it used the worst case operational year on a pollutant by pollutant basis. Aera used the emissions from the year 2029 for all pollutants, except NO_x, for which Aera used the emissions from 2024. The District used a slightly different approach. The District considered the peak year on a pollutant by pollutant basis for all emissions from sources VOL140-217. The District used the emissions from the year 2024 for NO_x, CO and SO_x; the emissions from 2029 were used for modeling PM₁₀ and PM_{2.5}.
 - c. The District considered the peak year for the fugitive dust emissions from various activities. PM₁₀ and PM_{2.5} emissions from fugitive dust in the peak year 2029 were included for well drilling and replacement well drilling. PM₁₀ and PM_{2.5} emissions from operational fugitive dust were identical for all years.
2. Offsite Vehicle Emissions. The District used the EMFAC2014 emission factors for a speed of 15 mph for the vehicle class LHDT1 and LHDT2 and for the PM₁₀ emission factors from vehicle class T6 and T7 for the offsite vehicle emissions (Source ID SLINE2). The District made these revisions based on Aera's *TABLE C-17: Air Toxic Emissions - DPM (Trucks/O&M/Drilling)* from the file *AQIA Revision Attachments v2.0.pdf* and Aera's *East Cat Canyon Oil Field Redevelopment Air Quality Impact Assessment* document (*Section 5.2 IMPACT AQ-2: LONG-TERM OPERATIONS EMISSIONS* of the file *ECC AQIA_8.10.17_Final.pdf*), which states that the speed of operations and maintenance vehicles is 15 mph.

5.3 Calculating Emission Rates for Various Averaging Periods

The Ambient Air Quality Standards (AAQS) for each pollutant are based on a specific averaging period. For example, the AAQS for SO₂ are for the averaging periods of 1-hour, 3-hour, 24-hour and annual. This means that emissions are calculated for the peak hour of operations for the 1-hour averaging period. The 3-hour averaging period would include the highest emissions that occur over the course of three hours. The 24-hour averaging period is based on the peak daily emissions. The emissions for the annual averaging period are based on average emission rate throughout the entire year. Permit-exempt emissions for the AQIA modeling were calculated for each pollutant and averaging period in the tab titled *gram per sec for AERMOD* in the file *AQIA Emission Calculations for VOL140_217_Drilling_Fugitive Dust_OandM Mobile.xlsx* and the tab titled *SLINE1-3* in the file *AQIA Emission Calculations for SLINE1-3_with APCD Revisions.xlsx*. Permitted emissions for the AQIA modeling were calculated for each pollutant and averaging period in the tab titled *AAQA Table 6* in the file *AAQA Tables ATC_03062016 (Revised by APCD).xlsx*. These files are located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachment section of this report.

5.4 SO₂ Flare Operation Emissions Scenarios

Emissions of SO₂ will be higher than normal during certain short term operations. The worst case short term flaring scenario is when sour produced gas is routed to the emergency flare for a maximum of 5 minutes in day. The total sulfur is assumed to be one percent, resulting in a daily SO₂ value of 1.32 lb/day. For modeling purposes, the 24-hour SO₂ emissions, the 3-hour SO₂ emissions and the 1-hour SO₂ emissions are all 1.32 lb from the flare since the flaring event occurs within 5 minutes.

The long term (annual) SO₂ emissions for the flare are based on sweetened produced gas routed to the emergency flare when the 62.5 MMBtu/hr steam generator is shut down. The flare will operate under these conditions for no more than 90 minutes per day for a total of 180 hours/year.

6.0 Structure Information

UTM Coordinates and dimensions for buildings and structures were submitted by Aera. Building downwash was selected as a control option in the air dispersion analysis and all structures were included in the AQIA. Building layouts are shown in Figure 1, *Building and Structures*, of Attachment J submitted by Aera on September 9, 2015. In addition, UTM Coordinates and dimensions for buildings and structures are listed in *TABLE I-11: Structure Parameters Used to Calculate Building Downwash* of the file *AAQA Tables ATC_03062016 (Revised by APCD).xlsx*. These files are located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachment section of this report.

7.0 Met Data & DEM Files

Meteorological data used in the air dispersion analyses were acquired at the Santa Maria Airport from 2010-2014. These files, *SMX10-14.PFL* and *SMX10-14.SFC*, were processed by the District using AERMET version 14134. The PROFBASE parameter was set to 79.6 m for the Santa Maria Airport. This value was from the District's *Modeling Guidelines for Health Risk Assessments*. Terrain and receptor elevations were determined using 7.5 min USGS Digital Elevation Model (DEM) files for the surrounding areas. Version 11103 of EPA's AERMAP terrain processor was used. Elevations from the DEM files using AERMAP were *not* imported for the on-site buildings and sources because the site will be graded for this project. The elevations for the buildings and sources were provided by Aera. The Digital Elevation Model (DEM) files used were for Foxen Canyon, Tepusquet Canyon, Twitchell Dam and Sisquoc, which are located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachments section of this report.

8.0 Model Information

The air dispersion modeling was conducted using Lakes AERMOD View, Version 9.5.0. The regulatory default Control options were enabled, and the rural option was selected. A flagpole height of 0 m was used for all receptors in the AQIA.

Individual residential, worker and sensitive receptors are not necessary for an AQIA. For ease of modeling, the same receptors used in the HRA were also used for the AQIA. The receptors used for both the AQIA and HRA are discussed below.

The receptors were placed 100 meters apart from the property boundary out to 2000 meters from the boundary. Boundary receptors were generated along the property boundary at 25 meters apart. A total of 5204 receptors were analyzed for the HRA and AQIA which included 620 property boundary receptors, 48 discrete residential receptors, four discrete worker receptors, 33 discrete road receptors, and grid receptors. In addition to the four worker receptors identified by Aera, the District also identified other potential receptors in the nearby offsite oil fields. Grid receptors were located at these locations, so placing additional discrete receptors was not necessary. There are no sensitive receptors such as schools, daycare facilities, hospitals, or care facilities located within two kilometers of the project site. However, Benjamin Foxen Elementary School is located approximately 2100 meters from the property boundary. The Sisquoc residential neighborhood is located adjacent to the Benjamin Foxen Elementary School. For that reason, a 25 meter grid (for a total of 750 grid receptors) was placed over the entire school's property boundary and the Sisquoc neighborhood to ensure that all potential risk receptors were evaluated. The UTM coordinates of the Sisquoc neighborhood and school receptors are located in *Sisquoc Receptors.csv*.

All grid and receptor data may be found in the file *Aera_CEQA_AQIA.ADO* located in the *Aera_CEQA_AQIAandHRA.zip* file referenced in the Attachments section of this report.

9.0 Results

The results for the Ambient Air Quality Standards (AAQS) analysis are shown in Table 9.1. As seen in Table 9.1, all impacts are below the AAQS except for PM₁₀ (24-hour and annual). The background concentrations of PM₁₀ (24-hour and annual) for the 2009-2011 averaging period exceed the AAQS. Aera's proposed project contributes to 16 percent of the 24-hour PM₁₀ AAQS and 9 percent of the annual PM₁₀ AAQS.

The ambient background concentrations in Table 9.1 are from the years 2009 through 2011, measured in Santa Maria when available, or in Lompoc if data was not available for Santa Maria. The background concentrations are documented in *Background Concentrations for Aera AQIA for ATC 14624.xlsx* located in the *Aera_CEQA_AQIAandHRA.zip* file.

Table 9.1 AAQS Modeling Results

Pollutant	Averaging Period	Modeled Impact Conc. ($\mu\text{g}/\text{m}^3$)	Ambient Background ($\mu\text{g}/\text{m}^3$)	Total Conc. ($\mu\text{g}/\text{m}^3$)	AAQS ($\mu\text{g}/\text{m}^3$)	Percent of AAQS
SO ₂	1-hour ¹	20.4	13.1	33.5	196	17%
	3-hour	13.1	8.0	21.1	1,300	1.6%
	24-hour	1.97	5.2	7.3	105	6.8%
	Annual	0.29	2.6	2.9	80	3.6
CO	1-hour	443.5	3565	4008	23,000	17%
	8-hour	212.9	1311	1524	10,000	15%
NO ₂ ²	1-hour	81.48	92.1	173.6	188	92%
	Annual	1.84	14.4	16.24	57	28%
PM ₁₀	24-hour	7.86	76.2	84.06	50	168%
	Annual	1.76	24.2	25.96	20	130%
PM _{2.5}	24-hour	1.71	17.3	19.01	35	54%
	Annual	0.27	7.0	7.27	12	61%

¹1-hour SO₂ impacts are reported as the 4th Highest Maximum Daily 1-hour Average Concentration (i.e., the 99th percentile daily maximum averaged over entire meteorology period of five years)

²1-hour NO₂ impacts are equal to the 1-hour NO_x concentration (101.84 $\mu\text{g}/\text{m}^3$) multiplied by 0.8 to represent Tier 2 NO_x/NO₂ conversion. The annual NO₂ impacts are equal to the 1-hour NO_x concentration (2.45 $\mu\text{g}/\text{m}^3$) multiplied by 0.75 to represent Tier 2 NO_x/NO₂ conversion

10.0 Conclusion

Based on these AQIA modeling results, the proposed project at Aera Energy LLC - East Cat Canyon will not create an exceedance of an ambient air quality standard for SO₂, CO, NO₂ or PM_{2.5}. The 24-hour PM₁₀ and annual PM₁₀ ambient air quality standards are exceeded based on the background concentrations alone. The modeled concentrations of PM₁₀ (24-hour and annual) for the project are well below the AAQS.

11.0 References

- Santa Barbara County Air Pollution Control District Rule 805. *Air Quality Impact Analysis, Modeling, Monitoring, and Air Quality Increment Consumption*. Adopted April, 17 1997, revised August 25, 2016. <https://www.ourair.org/wp-content/uploads/rule805.pdf>
- Santa Barbara County Air Pollution Control District. *Modeling Guidelines for Health Risk Assessments*. May 2017. <http://www.ourair.org/wp-content/uploads/apcd-15i.pdf>.
- Santa Barbara County Air Pollution Control District. *Piston IC Engine Technical Reference Document*. November 2002. <http://www.ourair.org/wp-content/uploads/sbcapcdicerefdoc.pdf>
- USEPA. *Table 3.2-3. Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines*. July 2000. <https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf>
- Aera Energy LLC. ATC 14624 application, *Application for Authorities to Construct East Cat Canyon Oil Field Redevelopment Project*, submitted April 17, 2015 (Revised September 9, 2015 and March 2016).
- Aera Energy LLC. *East Cat Canyon Oil Field Redevelopment Air Quality Impact Assessment*, prepared by Insight Environmental Consultants, February 2015 (Revised August 2015, March 2016, August 2017)
- Santa Barbara County Air Pollution Control District draft Air Quality Impact Analysis for ATC 14624, *Air Quality Impact Analysis Report: Aera Energy LLC East Cat Canyon ATC 14624*.

12.0 Attachment

Emissions calculations and AQIA input and output files may be found in the following location:

[\\sbcapcd.org\shares\Toxics\SourceFiles\SSID08811AeraEnergyLLC-EastCatCanyon\APCD_CEQA_HRAandAQIA\Aera_CEQA_AQIAandHRA.zip](https://sbcapcd.org/shares/Toxics/SourceFiles/SSID08811AeraEnergyLLC-EastCatCanyon/APCD_CEQA_HRAandAQIA/Aera_CEQA_AQIAandHRA.zip)

\\sbcapcd.org\shares\Toxics\SourceFiles\SSID08811AeraEnergyLLC-EastCatCanyon\APCD_CEQA_HRAandAQIA\AQIA\Aera East Cat Canyon AQIA Report for CEQA.doc

Emission Calculations and Modeling Files

(Electronic Files)

ATTACHMENT E

Equipment Specifications

- Detailed Equipment List
- Steam Generator Specification
 - Flare Specification
 - Flow Meter Specification
- Emergency Generator Specification
 - Miscellaneous Equipment
- Fluid Throughput Measurement
 - SG Fuel Use Measurement
- Sulfatreat® Monitoring and Media Replacement procedures
 - Gas Flaring Scenarios

Detailed Equipment List

Date: 1/20/16

Rev: E2

COS

EQUIPMENT LIST - Revised for Permit

AERA - FIELD REDEVELOPMENT PROJECT

LEGEND for Plant Processes

COS	Clean Oil Storage	ocp	Oil Cleaning Plant	SCP	Solids Concentration Plant
CPP	Central Plant Processes	Off-Plot	Off-Plot / Fire Water	SGS	Steam Generation Site
GS	Group Station	PGSG	Produced Gas Steam Generation	WCP	Water Cleaning Plant
LOS	Light Oil Storage	PGTP	Produced Gas Treatment Plant	WSP	Water Softening Plant

Feel free to use autofilters. Warning, Performing a sort will sever links to the other sheets!

IDENTIFICATION		DESCRIPTION				EQUIPMENT INFORMATION							
Tag Identifier	Tag Number	Description short	Description Long	Process Grouping	Project Phase (timing)	Process Media	Capacity	Size	Driver Type	Horse power	Ratings (MAWP, Press/Temp, etc.)	Codes	Location
FF	2150	Fin Fan Cooler	COS Stock Oil Cooler	COS	Phase 1	Stock Oil	1.75 MMBTU/hr	-	Motor	15	Design: 150 psig @ 300°F	API 661	CPF
FF	2160	Fin Fan Cooler	COS Stock Oil Cooler	COS	Phase 1	Stock Oil	1.75 MMBTU/hr	-	Motor	15	Design: 150 psig @ 300°F	API 661	CPF
HX	2400	Heat Exchanger	Steam Stock Oil Heating	COS	Phase 1	Stock Oil/Steam	1.5 MMBTU/hr	-	NA	NA	Design SH:300 psig T:150 psig ; 450°F	ASME Sec 8	CPF
L	2250	Meter	1-Bay Truck Loading and Metering Rack	COS	Phase 1	Stock Oil	400 gpm @ 285 psig	-	NA	NA	Design: 285 psig @ 250°F	API 11N	CPF
L	2260	Meter	1-Bay Truck Loading and Metering Rack	COS	Phase 1	Stock Oil	400 gpm @ 285 psig	-	NA	NA	Design: 285 psig @ 250°F	API 11N	CPF
L	2270	Meter	1-Bay Truck Loading and Metering Rack	COS	Phase 1	Stock Oil	400 gpm @ 285 psig	-	NA	NA	Design: 285 psig @ 250°F	API 11N	CPF
P	2210	Pump	Truck LACT Charge Pump	COS	Phase 1	Sales Oil	300 gpm @ 85 psig	-	Motor	20	Design: 85 psig @ 250°F	API 676	CPF
P	2220	Pump	Truck LACT Charge Pump	COS	Phase 1	Sales Oil	300 gpm @ 85 psig	-	Motor	20	Design: 85 psig @ 250°F	API 676	CPF
P	2230	Pump	Truck LACT Charge Pump	COS	Phase 1	Sales Oil	300 gpm @ 85 psig	-	Motor	20	Design: 85 psig @ 250°F	API 676	CPF
P	2340	Pump	COS Bottoms Water Transfer Pump	COS	Phase 1	Produced Water	100 gpm @ 50 psig	-	Motor	5	Design: 50 psig @ 250°F	ANSI B73.1	CPF
P	2350	Pump	COS Bottoms Water Transfer Pump	COS	Phase 1	Produced Water	100 gpm @ 50 psig	-	Motor	5	Design: 50 psig @ 250°F	ANSI B73.1	CPF
P	2410	Pump	COS Tank Heater Circulation Pump	COS	Phase 1	Produced Water	150 gpm @ 85 psig	-	Motor	15	Design: 85 psig @ 250°F	API 676	CPF
P	2420	Pump	COS Tank Heater Circulation Pump	COS	Phase 1	Produced Water	150 gpm @ 85 psig	-	Motor	15	Design: 85 psig @ 250°F	API 676	CPF
T	2170	Tank	COS Stock Oil Storage/ Reject Tank	COS	Phase 1	Stock Oil	10,000 BBL	55'-0" DIA x 24'-0" H	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
FF	2370	Fin Fan Cooler	COS Stock Oil Cooler	COS	Phase 2	Stock Oil	1.75 MMBTU/hr	-	Motor	15	Design: 150 psig @ 300°F	API 661	CPF
FF	2380	Fin Fan Cooler	COS Stock Oil Cooler	COS	Phase 2	Stock Oil	1.75 MMBTU/hr	-	Motor	15	Design: 150 psig @ 300°F	API 661	CPF
L	2280	Meter	1-Bay Truck Loading and Metering Rack	COS	Phase 2	Stock Oil	400 gpm @ 285 psig	-	NA	NA	Design: 285 psig @ 250°F	API 11N	CPF
P	2240	Pump	Truck LACT Charge Pump	COS	Phase 2	Sales Oil	300 gpm @ 85 psig	-	Motor	20	Design: 85 psig @ 250°F	API 676	CPF
P	2310	Pump	Pipeline LACT Charge Pump	COS	Phase 2	Sales Oil	500 gpm @ 130 psig	-	Motor	75	Design: 130 psig @ 250°F	API 676	CPF
P	2320	Pump	Pipeline LACT Charge Pump	COS	Phase 2	Sales Oil	500 gpm @ 130 psig	-	Motor	75	Design: 130 psig @ 250°F	API 676	CPF
T	2180	Tank	COS Stock Oil Storage/ Reject Tank	COS	Phase 2	Stock Oil	10,000 BBL	55'-0" DIA x 24'-0" H	NA	NA	Design: <1 psig @ 250°F	API 650	CPF

Date: 1/20/16
 Rev: E2
 CPP
 EQUIPMENT LIST - Revised for Permit
 AERA - FIELD REDEVELOPMENT PROJECT

LEGEND for Plant Processes

COS	Clean Oil Storage	OCF	Oil Cleaning Plant	SCP	Solids Concentration Plant
CPP	Central Plant Processes	Off-Plot	Off-Plot / Fire Water	SGS	Steam Generation Site
GS	Group Station	PGSG	Produced Gas Steam Generation	WCP	Water Cleaning Plant
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Feel free to use autofilters. Warning, Performing a sort will sever links to the other sheets!

IDENTIFICATION		DESCRIPTION				EQUIPMENT INFORMATION							
Tag Identifier	Tag Number	Description short	Description Long	Process Grouping	Project Phase (timing)	Process Media	Capacity	Size	Driver Type	Horse power	Ratings (MAWP, Press/Temp, etc.)	Codes	Location
FF	9020	Tank Vapor Fin Fan	COS/LOS Tank Vapor Cooling	CPP	Phase 1	Tank Vapors	0.25 MMBTU/HR	-	Motor	5	Design: 150 psig @ 200°F	API 661	CPF
FF	9030	Tank Vapor Fin Fan	COS/LOS Tank Vapor Cooling	CPP	Phase 1	Tank Vapors	0.25 MMBTU/HR	-	Motor	5	Design: 150 psig @ 200°F	API 661	CPF
FF	9160	Fin Fan Cooler	COS/LOS TVR Skid 1 Aftercooler	CPP	Phase 1	Tank Vapors	0.25 MMBTU/HR	-	Motor	5	Design: 150 psig @ 350°F	API 661	CPF
FF	9250	Tank Vapor Fin Fan	WSP Tank Vapor Cooling	CPP	Phase 1	Tank Vapors	0.25 MMBTU/HR	-	Motor	5	Design: 150 psig @ 200°F	API 661	CPF
FF	9260	Tank Vapor Fin Fan	WSP Tank Vapor Cooling	CPP	Phase 1	Tank Vapors	0.25 MMBTU/HR	-	Motor	5	Design: 150 psig @ 200°F	API 661	CPF
FF	9390	Fin Fan Cooler	WSP TVR Skid 1 Aftercooler	CPP	Phase 1	Tank Vapors	0.25 MMBTU/HR	-	Motor	5	Design: 150 psig @ 350°F	API 661	CPF
G	9640	Generator	Standby Generator	CPP	Phase 1	Power	762 kW	-	0	0	Volts/PH/HZ: 480/3/60 @ 1,200 RPM	0	CPF
K	9100	TVR Compressor	COS/LOS TVR Skid 1 Compressor	CPP	Phase 1	Tank Vapors	0.5 MMSCFD	-	Motor	60	Design: 30 psig / 35 psig	0	CPF
K	9330	TVR Compressor	WSP TVR Skid 1 Compressor	CPP	Phase 1	Tank Vapors	0.5 MMSCFD	-	Motor	60	Design: 30 psig / 35 psig	0	CPF
K	9470	Air Compressor	North Plant Instrument Air Skid 1	CPP	Phase 1	Air	115 ACFM @ 125 psi	-	Motor	30	125 psig @ 100°F	0	CPF
K	9530	Air Compressor	North Plant Instrument Air Skid 2	CPP	Phase 1	Air	115 ACFM @ 125 psi	-	Motor	30	125 psig @ 100°F	0	CPF
K	9660	Air Compressor	South Plant Instrument Air Skid 1	CPP	Phase 1	Air	115 ACFM @ 125 psi	-	Motor	30	125 psig @ 100°F	0	CPF
K	9720	Air Compressor	South Plant Instrument Air Skid 2	CPP	Phase 1	Air	115 ACFM @ 125 psi	-	Motor	30	125 psig @ 100°F	0	CPF
P	9040	TVR Condensate Pump	COS/LOS TVR Scrubber Condensate Pump1	CPP	Phase 1	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9050	TVR Condensate Pump	COS/LOS TVR Scrubber Condensate Pump2	CPP	Phase 1	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9080	TVR Condensate Pump	COS/LOS TVR Skid 1 Scrubber Condensate Pump	CPP	Phase 1	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9140	Lube Oil Pump	COS/LOS TVR Skid 1 Compressor Lube Oil Pump	CPP	Phase 1	Lube Oil	40 psig	-	Motor	0.75	Design: 40 psig @ 250°F	API 676	CPF
P	9180	Jacket Water Pump	COS/LOS TVR Skid 1 Jacket Water Pump	CPP	Phase 1	Water	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9270	TVR Condensate Pump	WSP TVR Scrubber Condensate Pump1	CPP	Phase 1	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9310	TVR Condensate Pump	WSP TVR Skid 1 Scrubber Condensate Pump	CPP	Phase 1	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9370	Lube Oil Pump	WSP TVR Skid 1 Compressor Lube Oil Pump	CPP	Phase 1	Lube Oil	40 psig	-	Motor	0.75	Design: 40 psig @ 250°F	API 676	CPF
P	9410	Jacket Water Pump	WSP TVR Skid 1 Jacket Water Pump	CPP	Phase 1	Water	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9570	Pump	Drain Tank Liquids Pump	CPP	Phase 1	Drains	100 gpm @ 70 psig	-	Motor	10	70 psig @ 250°F	ANSI B73.1	CPF
P	9610	Pump	Drain Tank Liquids Pump	CPP	Phase 1	Drains	100 gpm @ 70 psig	-	Motor	10	70 psig @ 250°F	ANSI B73.1	CPF
T	9120	Lube Oil Reservoir	COS/LOS TVR Skid 1 Compressor Lube Oil Reservoir	CPP	Phase 1	Lube Oil	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
T	9200	Jacket Water Reservoir	COS/LOS TVR Skid 1 Compressor Jacket Water Reservoir	CPP	Phase 1	Water	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
T	9350	Lube Oil Reservoir	WSP TVR Skid 1 Compressor Lube Oil Reservoir	CPP	Phase 1	Lube Oil	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
T	9430	Jacket Water Reservoir	WSP TVR Skid 1 Compressor Jacket Water Reservoir	CPP	Phase 1	Water	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
V	9010	TVR Inlet Scrubber	COS/LOS TVR Main Inlet Scrubber	CPP	Phase 1	Tank Vapors	0	16" Dia X 9'-0" SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	9060	Skid Inlet Scrubber	COS/LOS TVR Skid 1 Inlet Scrubber	CPP	Phase 1	Tank Vapors	0	16" Dia X 9'-0" SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	9220	TVR Discharge Scrubber	COS/LOS TVR Skid 1 Discharge Scrubber	CPP	Phase 1	Tank Vapors	0	12"-9" Dia X 8'-6"SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	9240	TVR Inlet Scrubber	WSP TVR Main Inlet Scrubber	CPP	Phase 1	Tank Vapors	0	16" Dia X 9'-0" SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	9290	Skid Inlet Scrubber	WSP TVR Skid 1 Inlet Scrubber	CPP	Phase 1	Tank Vapors	0	16" Dia X 9'-0" SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	9450	TVR Discharge Scrubber	WSP TVR Skid 1 Discharge Scrubber	CPP	Phase 1	Tank Vapors	0	12"-9" Dia X 8'-6"SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	9500	Air Receiver	Instrument Air Receiver	CPP	Phase 1	Air	400 gal	36" dia x 80" s/s	NA	NA	200 psig @ 200°F	ASME Sec 8	CPF
V	9510	Air Dryer	Instrument Air Dryer	CPP	Phase 1	Air	250 ACFM	-	NA	NA	200 psig @ 200°F	ASME Sec 8	CPF
V	9520	Air Dryer	Instrument Air Dryer	CPP	Phase 1	Air	250 ACFM	-	NA	NA	200 psig @ 200°F	ASME Sec 8	CPF
V	9560	Tank	Drain Tank	CPP	Phase 1	Drains	100 BBL	6'-0" DIA x 20'-0" S/S	NA	NA	0	ASME Sec 8	CPF
V	9600	Tank	Drain Tank	CPP	Phase 1	Drains	100 BBL	6'-0" DIA x 20'-0" S/S	NA	NA	0	ASME Sec 8	CPF
V	9690	Air Receiver	Instrument Air Receiver	CPP	Phase 1	Air	400 gal	36" dia x 80" s/s	NA	NA	200 psig @ 200°F	ASME Sec 8	CPF
V	9700	Air Dryer	Instrument Air Dryer	CPP	Phase 1	Air	250 ACFM	-	NA	NA	200 psig @ 200°F	ASME Sec 8	CPF
V	9710	Air Dryer	Instrument Air Dryer	CPP	Phase 1	Air	250 ACFM	-	NA	NA	200 psig @ 200°F	ASME Sec 8	CPF
FF	9170	Fin Fan Cooler	COS/LOS TVR Skid 2 Aftercooler	CPP	Phase 2	Tank Vapors	0.25 MMBTU/HR	-	Motor	5	Design: 150 psig @ 350°F	API 661	CPF
FF	9400	Fin Fan Cooler	WSP TVR Skid 2 Aftercooler	CPP	Phase 2	Tank Vapors	0.25 MMBTU/HR	-	Motor	5	Design: 150 psig @ 350°F	API 661	CPF
K	9110	TVR Compressor	COS/LOS TVR Skid 2 Compressor	CPP	Phase 2	Tank Vapors	0.5 MMSCFD	-	Motor	60	Design: 30 psig / 35 psig	0	CPF
K	9340	TVR Compressor	WSP TVR Skid 2 Compressor	CPP	Phase 2	Tank Vapors	0.5 MMSCFD	-	Motor	60	Design: 30 psig / 35 psig	0	CPF
P	9090	TVR Condensate Pump	COS/LOS TVR Skid 2 Scrubber Condensate Pump	CPP	Phase 2	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9150	Lube Oil Pump	COS/LOS TVR Skid 2 Compressor Lube Oil Pump	CPP	Phase 2	Lube Oil	40 psig	-	Motor	0.75	Design: 40 psig @ 250°F	API 676	CPF
P	9190	Jacket Water Pump	COS/LOS TVR Skid 2 Jacket Water Pump	CPP	Phase 2	Water	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9280	TVR Condensate Pump	WSP TVR Scrubber Condensate Pump2	CPP	Phase 2	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9320	TVR Condensate Pump	WSP TVR Skid 2 Scrubber Condensate Pump	CPP	Phase 2	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9380	Lube Oil Pump	WSP TVR Skid 2 Compressor Lube Oil Pump	CPP	Phase 2	Lube Oil	40 psig	-	Motor	0.75	Design: 40 psig @ 250°F	API 676	CPF
P	9420	Jacket Water Pump	WSP TVR Skid 2 Jacket Water Pump	CPP	Phase 2	Water	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9580	Pump	Drain Tank Liquids Pump	CPP	Phase 2	Drains	100 gpm @ 70 psig	-	Motor	10	70 psig @ 250°F	ANSI B73.1	CPF
P	9590	Pump	Drain Tank Containment Pump	CPP	Phase 2	Drains	20 gpm @ 10 psig	-	Motor	1	0	ASME Sec 8	CPF
P	9620	Pump	Drain Tank Liquids Pump	CPP	Phase 2	Drains	100 gpm @ 70 psig	-	Motor	5	70 psig @ 250°F	ANSI B73.1	CPF
P	9630	Pump	Drain Tank Containment Pump	CPP	Phase 2	Drains	20 gpm @ 10 psig	-	Motor	1	0	ASME Sec 8	CPF
T	9130	Lube Oil Reservoir	COS/LOS TVR Skid 2 Compressor Lube Oil Reservoir	CPP	Phase 2	Lube Oil	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
T	9210	Jacket Water Reservoir	COS/LOS TVR Skid 2 Compressor Jacket Water Reservoir	CPP	Phase 2	Water	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
T	9360	Lube Oil Reservoir	WSP TVR Skid 2 Compressor Lube Oil Reservoir	CPP	Phase 2	Lube Oil	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
T	9440	Jacket Water Reservoir	WSP TVR Skid 2 Compressor Jacket Water Reservoir	CPP	Phase 2	Water	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
V	9070	Skid Inlet Scrubber	COS/LOS TVR Skid 2 Inlet Scrubber	CPP	Phase 2	Tank Vapors	0	16" Dia X 9'-0" SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	9230	TVR Discharge Scrubber	COS/LOS TVR Skid 1 Discharge Scrubber	CPP	Phase 2	Tank Vapors	0	12"-9" Dia X 8'-6"SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	9300	Skid Inlet Scrubber	WSP TVR Skid 2 Inlet Scrubber	CPP	Phase 2	Tank Vapors	0	16" Dia X 9'-0" SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	9460	TVR Discharge Scrubber	WSP TVR Skid 2 Discharge Scrubber	CPP	Phase 2	Tank Vapors	0	12"-9" Dia X 8'-6"SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF

Date: 1/20/16

Rev: E2

GS

EQUIPMENT LIST - Revised for Permit

AERA - FIELD REDEVELOPMENT PROJECT

LEGEND for Plant Processes

COS	Clean Oil Storage	ocp	Oil Cleaning Plant	SCP	Solids Concentration Plant
CPP	Central Plant Processes	Off-Plot	Off-Plot / Fire Water	SGS	Steam Generation Site
GS	Group Station	PGSG	Produced Gas Steam Generation	WCP	Water Cleaning Plant
LOS	Light Oil Storage	PGTP	Produced Gas Treatment Plant	WSP	Water Softening Plant

Feel free to use autofilters. Warning, Performing a sort will sever links to the other sheets!

IDENTIFICATION		DESCRIPTION				EQUIPMENT INFORMATION							
Tag Identifier	Tag Number	Description short	Description Long	Process Grouping	Project Phase (timing)	Process Media	Capacity	Size	Driver Type	Horse power	Ratings (MAWP, Press/Temp, etc.)	Codes	Location
V	1010	De-gassing Vessel	Group Station Prod Trn 1 De-gassing Vessel	GS	Phase 1	Emulsion	25,000 BPD	8'-0" DIA x 30'-0" (SS)	NA	NA	Design: 300 psig @ 400F, Op: 25 psig @ 260F	ASME Sec 8	GS
V	1190	Air Receiver	Group Station Instrument Air Receiver	GS	Phase 1	Air	200 Gal	2'-6" DIA x 6'-0" (SS)	NA	NA	Design: 200 psig @ 200F, Op: 125 psig @ 100F	ASME Sec 8	GS
V	1210	De-gassing Vessel	Group Station Prod Trn 2 De-gassing Vessel	GS	Phase 2	Emulsion	25,000 BPD	8'-0" DIA x 30'-0" (SS)	NA	NA	Design: 300 psig @ 400F, Op: 25 psig @ 260F	ASME Sec 8	GS

Date: 1/20/16

Rev: E2

LOS

EQUIPMENT LIST - Revised for Permit

AERA - FIELD REDEVELOPMENT PROJECT

LEGEND for Plant Processes

COS	Clean Oil Storage	ocp	Oil Cleaning Plant	SCP	Solids Concentration Plant
CPP	Central Plant Processes	Off-Plot	Off-Plot / Fire Water	SGS	Steam Generation Site
GS	Group Station	PGSG	Produced Gas Steam Generation	WCP	Water Cleaning Plant
LOS	Light Oil Storage	PGTP	Produced Gas Treatment Plant	WSP	Water Softening Plant

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IDENTIFICATION		DESCRIPTION				EQUIPMENT INFORMATION							
Tag Identifier	Tag Number	Description short	Description Long	Process Grouping	Project Phase (timing)	Process Media	Capacity	Size	Driver Type	Horse power	Ratings (MAWP, Press/Temp, etc.)	Codes	Location
L	2130	Meter	1-Bay Metering and Unloading Rack	LOS	Phase 1	Light Crude	4" meter- 400 GPM	-	NA	NA	Design: 285 psig @ 250°F	API 11N	CPF
P	2010	Pump	LCO Truck Unloading Pump	LOS	Phase 1	Light Crude	300 gpm @ 50 psig	-	Motor	15	Design: 50 psig @ 250°F	API 676	CPF
P	2020	Pump	LCO Truck Unloading Pump	LOS	Phase 1	Light Crude	300 gpm @ 50 psig	-	Motor	15	Design: 50 psig @ 250°F	API 676	CPF
P	2070	Pump	LCO Treating Blend Pump	LOS	Phase 1	Light Crude	100 gpm @ 85 psig	-	VFD	10	Design: 85 psig @ 250°F	API 676	CPF
P	2080	Pump	LCO Treating Blend Pump	LOS	Phase 1	Light Crude	100 gpm @ 85 psig	-	VFD	10	Design: 85 psig @ 250°F	API 676	CPF
P	2360	Pump	LCO Bottoms Water Pump	LOS	Phase 1	Produced Water	100 gpm @ 50psig	-	Motor	5	Design: 50 psig @ 250°F	ANSI B73.1	CPF
P	2370	Pump	LCO Bottoms Water Pump	LOS	Phase 1	Produced Water	100 gpm @ 50psig	-	Motor	5	Design: 50 psig @ 250°F	ANSI B73.1	CPF
T	2040	Tank	LCO Storage Tank	LOS	Phase 1	Light Crude	6,500 BBL	44'-0" DIA x 24'-0" H	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
L	2140	Meter	1-Bay Metering and Unloading Rack	LOS	Phase 2	Light Crude	4" meter- 400 GPM	-	NA	NA	Design: 285 psig @ 250°F	API 11N	CPF
P	2030	Pump	LCO Truck Unloading Pump	LOS	Phase 2	Light Crude	300 gpm @ 50 psig	-	Motor	15	Design: 50 psig @ 250°F	API 676	CPF
P	2110	Pump	Pipeline Blend Pump	LOS	Phase 2	Light Crude	200 gpm @130 psig	-	VFD	20	Design: 130 psig @ 250°F	API 676	CPF
P	2120	Pump	Pipeline Blend Pump	LOS	Phase 2	Light Crude	200 gpm @130 psig	-	VFD	20	Design: 130 psig @ 250°F	API 676	CPF
T	2050	Tank	LCO Storage Tank	LOS	Phase 2	Light Crude	6,500 BBL	44'-0" DIA x 24'-0" H	NA	NA	Design: <1 psig @ 250°F	API 650	CPF

Date: 1/20/16

Rev: E2

OCF

EQUIPMENT LIST - Revised for Permit

AERA - FIELD REDEVELOPMENT PROJECT

LEGEND for Plant Processes

COS	Clean Oil Storage	OCF	Oil Cleaning Plant	SCP	Solids Concentration Plant
CPP	Central Plant Processes	Off-Plot	Off-Plot / Fire Water	SGS	Steam Generation Site
GS	Group Station	PGSG	Produced Gas Steam Generation	WCP	Water Cleaning Plant
LOS	Light Oil Storage	PGTP	Produced Gas Treatment Plant	WSP	Water Softening Plant

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IDENTIFICATION		DESCRIPTION				EQUIPMENT INFORMATION							
Tag Identifier	Tag Number	Description short	Description Long	Process Grouping	Project Phase (timing)	Process Media	Capacity	Size	Driver Type	Horse power	Ratings (MAWP, Press/Temp, etc.)	Codes	Location
FF	1510	OCF Vapor Fin Fan	OCF Tank Vapor Cooler	OCF	Phase 1	Tank Vapors	0.2 MMBTU/HR	-	Motor	5	Design: 150 psig @ 200°F	API 661	GS
FF	1650	Fin Fan Cooler	OCF TVR Skid 1 Aftercooler	OCF	Phase 1	Tank Vapors	1.02 MMBTU/HR	-	Motor	10	Design: 150 psig @ 350°F	API 661	CPF
FF	9800	Fin Fan Cooler	Heat Medium Trim Cooler	OCF	Phase 1	Heat Medium	11.3 MMBTU/hr	16'-0" x 14'-0"	Motor	25	250 psig @ 250°F	API 661	CPF
FF	9810	Fin Fan Cooler	Heat Medium Trim Cooler	OCF	Phase 1	Heat Medium	11.3 MMBTU/hr	16'-0" x 14'-0"	Motor	10	150 psig @ 350°F	API 661	CPF
HX	1050	Emulsion/Steam Heat Exchanger	Emulsion S/T Pre-Heat Exchanger Train 1	OCF	Phase 1	Emulsion	5.5 MMBTU/hr	-	NA	NA	Design SH:300 psig T:300 psig ;450°F	ASME Sec 8	CPF
HX	1080	Gas/Heating Media Heat Exchanger	Produced Gas Cooler Train 1	OCF	Phase 1	Produced Gas	10.0 MMBTU/hr	-	NA	NA	Design SH:300 psig T:150 psig ;300°F	ASME Sec 8	GS
HX	1090	Emulsion/Heating Media Heat Exchanger	Treated Oil Cooler Train 1	OCF	Phase 1	Emulsion	4.0 MBTU/hr	-	NA	NA	Design SH:300 psig T:150 psig ;300°F	ASME Sec 8	CPF
HX	1100	Water/Heating Media Heat Exchanger	Produced Water Cooler Train 1	OCF	Phase 1	Produced Water	27.3 MMBTU/hr	-	NA	NA	Design SH:300 psig T:150 psig ;300°F	ASME Sec 8	CPF
HX	1110	LCO/Steam Heat Exchanger	LCO S/T Heat Exchanger (Steam) Train 1	OCF	Phase 1	Light Crude	1.0 MMBTU/hr	-	NA	NA	Design SH:300 psig T:150 psig ; 450°F	ASME Sec 8	CPF
HX	1120	LCO/Heating media Heat Exchanger	LCO S/T Heater Exchanger (heat medium) Train 1	OCF	Phase 1	Light Crude	1.5 MMBTU/hr	-	NA	NA	Design SH:300 psig T:150 psig ;300°F	ASME Sec 8	CPF
K	1590	TVR Compressor	OCF TVR Skid 1 Compressor	OCF	Phase 1	Tank Vapors	0.7 MMSCFD	-	Motor	150	Design: 100 psig / 100 psig	0	GS
P	1530	TVR Condensate Pump	OCF TVR Scrubber Condensate Pump1	OCF	Phase 1	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	1570	TVR Condensate Pump	OCF TVR Skid 1 Scrubber Condensate Pump	OCF	Phase 1	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	1630	Lube Oil Pump	OCF TVR Skid 1 Compressor Lube Oil Pump	OCF	Phase 1	Lube Oil	40 psig	-	Motor	5	Design: 150 psig @ 250°F	ANSI B73.1	CPF
P	1670	Jacket Water Pump	OCF TVR Skid 1 Jacket Water Pump	OCF	Phase 1	Water	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9830	Pump	Heat Medium Circulation Pump	OCF	Phase 1	Heat Medium	920gpm @ 240psi	-	Motor	250	0	ANSI B73.1	CPF
P	9840	Pump	Heat Medium Circulation Pump	OCF	Phase 1	Heat Medium	920gpm @ 240psi	-	Motor	250	0	ANSI B73.1	CPF
T	1610	Lube Oil Reservoir	OCF TVR Skid 1 Compressor Lube Oil Reservoir	OCF	Phase 1	Lube Oil	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
T	9860	Tank	Heat Medium Storage Tank	OCF	Phase 1	Heat Medium	750 BBL	15'-6" DIA x 24'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
V	1020	Desanding Vessel	Production De-Sanding & De-Gassing Train 1	OCF	Phase 1	Production	25,000 BPD	8'-0" DIA x 16'-0" S/S	NA	NA	Design: 200 psig @ 350F, Op: 55 psig @ 260F	ASME Sec 8	CPF
V	1030	Desanding Vessel	Production De-Sanding & De-Gassing Train 1	OCF	Phase 1	Production	25,000 BPD	8'-0" DIA x 16'-0" S/S	NA	NA	Design: 200 psig @ 350F, Op: 55 psig @ 260F	ASME Sec 8	CPF
V	1040	FWKO	Free-Water Knockout Horiz Vessel Train 1	OCF	Phase 1	Production	25,000 BPD	12'-0" DIA x 60'-0" S/S	NA	NA	Design: 125 psig @ 350F, Op: 45 psig @ 260F	ASME Sec 8	CPF
V	1060	Electrostatic Coalescer	Electrostatic Coalescer Horiz Vessel Train 1	OCF	Phase 1	Emulsion	10,000 BPD	12'-0" DIA x 60'-0" S/S	NA	NA	Design: 125 psig @ 350F/ Op: 35 psig @ 260F	ASME Sec 8	CPF
V	1070	Scrubber	Produced Gas Scrubber Train 1	OCF	Phase 1	Produced Gas	5.0 MMSCFD	3'-6" DIA x 12'-0" S/S	NA	NA	Design: 125 psig @ 350F/ Op: 25 psig @ 260F	ASME Sec 8	CPF
V	1500	OCF TVR Scrubber	OCF TVR Main Inlet Scrubber	OCF	Phase 1	Tank Vapors	0	36"Dia X 12'-0" SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	1550	TVR Inlet Scrubber	OCF TVR Skid 1 Inlet Scrubber	OCF	Phase 1	Tank Vapors	0	36"Dia X 12'-0" SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	GS
V	1690	Jacket Water Reservoir	OCF TVR Skid 1 Compressor Lube Jacket Water Reservoir	OCF	Phase 1	Water	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
V	1710	TVR Discharge Scrubber	TVR Skid 1 Discharge Scrubber	OCF	Phase 1	Tank Vapors	0	24"Dia X 9'-0"SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	9820	Vessel	Heat Medium Expansion Vessel	OCF	Phase 1	Heat Medium	50 BBL	5'-0" DIA x 15'-0" S/S	Motor	250	0	ASME Sec 8	CPF
FF	1520	OCF Vapor Fin Fan	OCF Tank Vapor Cooler	OCF	Phase 2	Tank Vapors	0.2 MMBTU/HR	-	Motor	5	Design: 150 psig @ 200°F	API 661	GS
FF	1660	Fin Fan Cooler	OCF TVR Skid 2 Aftercooler	OCF	Phase 2	Tank Vapors	1.02 MMBTU/HR	-	Motor	10	Design: 150 psig @ 350°F	API 661	CPF
FF	9900	Fin Fan Cooler	Heat Medium Trim Cooler	OCF	Phase 2	Heat Medium	11.3 MMBTU/hr	16'-0" x 14'-0"	Motor	25	250 psig @ 250°F	API 661	CPF
FF	9910	Fin Fan Cooler	Heat Medium Trim Cooler	OCF	Phase 2	Heat Medium	11.3 MMBTU/hr	16'-0" x 14'-0"	Motor	40	150 psig @ 350°F	API 661	CPF
HX	1250	Emulsion/Steam Heat Exchanger	Emulsion S/T Pre-Heat Exchanger Train 2	OCF	Phase 2	Emulsion	5.5 MMBTU/hr	-	NA	NA	Design SH:300 psig T:300 psig ;450°F	ASME Sec 8	CPF
HX	1280	Gas/Heating Media Heat Exchanger	Produced Gas Cooler Train 2	OCF	Phase 2	Produced Gas	10.0 MMBTU/hr	-	NA	NA	Design SH:300 psig T:150 psig ;300°F	ASME Sec 8	GS
HX	1290	Emulsion/Heating Media Heat Exchanger	Treated Oil Cooler Train 2	OCF	Phase 2	Emulsion	4.0 MBTU/hr	-	NA	NA	Design SH:300 psig T:150 psig ;300°F	ASME Sec 8	CPF
HX	1300	Water/Heating Media Heat Exchanger	Produced Water Cooler Train 2	OCF	Phase 2	Produced Water	27.3 MMBTU/hr	-	NA	NA	Design SH:300 psig T:150 psig ;300°F	ASME Sec 8	CPF
HX	1310	LCO/Steam Heat Exchanger	LCO S/T Heat Exchanger (Steam) Train 2	OCF	Phase 2	Light Crude	1.0 MMBTU/hr	-	NA	NA	Design SH:300 psig T:300 psig ; 450°F	ASME Sec 8	CPF
HX	1320	LCO/Heating media Heat Exchanger	LCO S/T Heater Exchanger (heat medium) Train 2	OCF	Phase 2	Light Crude	1.5 MMBTU/hr	-	NA	NA	Design SH:300 psig T:150 psig ;300°F	ASME Sec 8	CPF
K	1600	TVR Compressor	OCF TVR Skid 2 Compressor	OCF	Phase 2	Tank Vapors	0.7 MMSCFD	-	Motor	150	Design: 100 psig / 100 psig	0	GS
P	1540	TVR Condensate Pump	OCF TVR Scrubber Condensate Pump2	OCF	Phase 2	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	1580	TVR Condensate Pump	OCF TVR Skid 2 Scrubber Condensate Pump	OCF	Phase 2	Tank Vapors	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	1640	Lube Oil Pump	OCF TVR Skid 2 Compressor Lube Oil Pump	OCF	Phase 2	Lube Oil	40 psig	-	Motor	5	Design: 150 psig @ 250°F	ANSI B73.1	CPF
P	1680	Jacket Water Pump	OCF TVR Skid 2 Jacket Water Pump	OCF	Phase 2	Water	15 gpm @ 40 psig	-	Motor	1.5	Design: 40 psig @ 250°F	ANSI B73.1	CPF
P	9930	Pump	Heat Medium Circulation Pump	OCF	Phase 2	Heat Medium	920gpm @ 240psi	-	Motor	250	0	ANSI B73.1	CPF
P	9940	Pump	Heat Medium Circulation Pump	OCF	Phase 2	Heat Medium	920gpm @ 240psi	-	Motor	250	0	ANSI B73.1	CPF
T	1620	Lube Oil Reservoir	OCF TVR Skid 2 Compressor Lube Oil Reservoir	OCF	Phase 2	Lube Oil	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
T	9960	Tank	Heat Medium Storage Tank	OCF	Phase 2	Heat Medium	750 BBL	15'-6" DIA x 24'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
V	1220	Desanding Vessel	Production De-Sanding & De-Gassing Train 2	OCF	Phase 2	Production	25,000 BPD	8'-0" DIA x 16'-0" S/S	NA	NA	Design: 200 psig @ 350F, Op: 55 psig @ 260F	ASME Sec 8	CPF
V	1230	Desanding Vessel	Production De-Sanding & De-Gassing Train 2	OCF	Phase 2	Production	25,000 BPD	8'-0" DIA x 16'-0" S/S	NA	NA	Design: 200 psig @ 350F, Op: 55 psig @ 260F	ASME Sec 8	CPF
V	1240	FWKO	Free-Water Knockout Horiz Vessel Train 2	OCF	Phase 2	Production	25,000 BPD	12'-0" DIA x 60'-0" S/S	NA	NA	Design: 125 psig @ 350F, Op: 45 psig @ 260F	ASME Sec 8	CPF
V	1260	Electrostatic Coalescer	Electrostatic Coalescer Horiz Vessel Train 2	OCF	Phase 2	Emulsion	10,000 BPD	12'-0" DIA x 60'-0" S/S	NA	NA	Design: 125 psig @ 350F/ Op: 35 psig @ 260F	ASME Sec 8	CPF
V	1270	Scrubber	Produced Gas Scrubber Train 2	OCF	Phase 2	Produced Gas	5.0 MMSCFD	3'-6" DIA x 12'-0" S/S	NA	NA	Design: 125 psig @ 350F/ Op: 25 psig @ 260F	ASME Sec 8	CPF
V	1560	TVR Inlet Scrubber	OCF TVR Skid 2 Inlet Scrubber	OCF	Phase 2	Tank Vapors	0	36"Dia X 12'-0" SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	GS
V	1700	Jacket Water Reservoir	OCF TVR Skid 2 Compressor Lube Jacket Water Reservoir	OCF	Phase 2	Water	by Vendor	-	NA	NA	by Vendor	ASME Sec 8	CPF
V	1720	TVR Discharge Scrubber	TVR Skid 1 Discharge Scrubber	OCF	Phase 2	Tank Vapors	0	24"Dia X 9'-0"SS	NA	NA	Design: 150 psig @ 350°F	ASME Sec 8	CPF
V	9920	Vessel	Heat Medium Expansion Vessel	OCF	Phase 2	Heat Medium	50 BBL	5'-0" DIA x 15'-0" S/S	Motor	250	0	ASME Sec 8	CPF

Date: 1/20/16

Rev: E2

PGSG

EQUIPMENT LIST - Revised for Permit

AERA - FIELD REDEVELOPMENT PROJECT

LEGEND for Plant Processes

COS	Clean Oil Storage	ocp	Oil Cleaning Plant	SCP	Solids Concentration Plant
CPP	Central Plant Processes	Off-Plot	Off-Plot / Fire Water	SGS	Steam Generation Site
GS	Group Station	PGSG	Produced Gas Steam Generation	WCP	Water Cleaning Plant
LOS	Light Oil Storage	PGTP	Produced Gas Treatment Plant	WSP	Water Softening Plant

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IDENTIFICATION		DESCRIPTION				EQUIPMENT INFORMATION							
Tag Identifier	Tag Number	Description short	Description Long	Process Grouping	Project Phase (timing)	Process Media	Capacity	Size	Driver Type	Horse power	Ratings (MAWP, Press/Temp, etc.)	Codes	Location
P	6010	Pump	Feedwater Pump	PGSG	Phase 1	Water	3,200 BPD @ 2,600 psig	-	VFD	250	2,600 psig @ 200°F	API 674	SGS
SG	6030	Steam Generator	OTSG - 62.5 MMBTU/hr	PGSG	Phase 1	Steam	62.5 MMBTU/hr	-	VFD	125	2,600 psig @ 675°F	ASME Sec1	SGS
V	6040	Separator	Steam-Liquid Separator	PGSG	Phase 1	Steam	4000 BSPD	48" DIA x 12'-0"	NA	NA	2,600 psig @ 675°F	ASME Sec 8	SGS
V	6050	Separator	Fuel Gas Scrubber	PGSG	Phase 1	Fuel Gas	2.0 MMSCFD	8.625" DIA x 6'-6"	NA	NA	285 psig @ 150°F	ASME Sec 8	SGS
BL	6220	Blower	WESP ID Fan	PGSG	Phase 2	Air	30,000 SCFM	-	Motor	75	Temp 200°F	0	SGS
BL	6250	Blower	WESP Air Blower	PGSG	Phase 2	Air	0	-	VFD	2	0	0	SGS
HX	6240	Air Heater	WESP Air Heater	PGSG	Phase 2	Air	92.2 MMBTU/Hr	-	Motor	27 kW	0	0	SGS
P	6120	Pump	SO2 Primary Recycle Pump	PGSG	Phase 2	SO2 Waste	860 gpm @ 100FT TDH	4" X 6" -13, IMP 10.625"	Motor	50	50 psig @ 250°F	ANSI B73.1	SGS
P	6130	Pump	SO2 Primary Recycle Pump	PGSG	Phase 2	SO2 Waste	860 gpm @ 100FT TDH	4" X 6" -13, IMP 10.625"	Motor	50	50 psig @ 250°F	ANSI B73.1	SGS
P	6150	Pump	SO2 Secondary Recycle Pump	PGSG	Phase 2	SO2 Waste	360 gpm @ 100 FT TDH	2" x 3" - 13, IMP 11.000"	Motor	20	50 psig @ 250°F	ANSI B73.1	SGS
P	6160	Pump	SO2 Secondary Recycle Pump	PGSG	Phase 2	SO2 Waste	360 gpm @ 100 FT TDH	2" x 3" - 13, IMP 11.000"	Motor	20	50 psig @ 250°F	ANSI B73.1	SGS
P	6270	Pump	SO2/WESP 25% Caustic Pump	PGSG	Phase 2	Caustic	40 gpm @ 300 ft	1" x 1.5"-8, 6.875 Imp	Motor	15	130 psig @ 170°F	API 675	SGS
P	6280	Pump	SO2/WESP 25% Caustic Pump	PGSG	Phase 2	Caustic	40 gpm @ 300 ft	1" x 1.5"-8, 6.875 Imp	Motor	15	130 psig @ 170°F	API 675	SGS
P	6300	Pump	WESP 1% Caustic Pump	PGSG	Phase 2	Caustic	5 gpm @ 320 ft	1 SV-12 Stage	VFD	1.5	140 psig @ 170°F	API 675	SGS
P	6310	Pump	WESP 1% Caustic Pump	PGSG	Phase 2	Caustic	5 gpm @ 320 ft	1 SV-12 Stage	VFD	1.5	140 psig @ 170°F	API 675	SGS
P	6330	Pump	SO2/WESP Waste Tank Pumps	PGSG	Phase 2	SO2/WESP Waste	45 gpm @ 80FT	1" x 1.5"-6, 4.375 Imp	Motor	5	20 psig @ 170°F	ANSI B73.1	SGS
P	6340	Pump	SO2/WESP Waste Tank Pumps	PGSG	Phase 2	SO2/WESP Waste	45 gpm @ 80FT	1" x 1.5"-6, 4.375 Imp	Motor	5	20 psig @ 170°F	ANSI B73.1	SGS
T	6260	Tank	SO2/WESP 25% Caustic Tank	PGSG	Phase 2	Caustic	750 BBL	15'-6" DIA x 24'-0"	NA	NA	<1 psig; 200°F	API 12 F	SGS
T	6290	Tank	WESP 1% Caustic Tank	PGSG	Phase 2	Caustic	90 BBL	7'-11" DIA x 10'-0"	NA	NA	<1 psig; 200°F	API 12 F	SGS
T	6320	Tank	SO2/ Waste Tank	PGSG	Phase 2	SO2/WESP Waste	300 BBL	12'-0" DIA x 15'	NA	NA	<1 psig; 200°F	API 12 F	SGS
V	6110	Vessel	SO2 Primary Absorber	PGSG	Phase 2	Sour Flue Gas	282 BBL	8'-6" DIA x 31'-6" OAH	NA	NA	12psig/-5.6osi; 500°F/-20°F	ASME Sec 8	SGS
V	6140	Vessel	SO2 Secondary Absorber	PGSG	Phase 2	Sour Flue Gas	282 BBL	8'-6" DIA x 31'-6" OAH	NA	NA	12psig/-5.6osi; 500°F/-20°F	ASME Sec 8	SGS
V	6210	Vessel	WESP	PGSG	Phase 2	Flue Gas	1,500 MCFD	12'-0" DIA x 36'-10.5" OAH	NA	NA	0	ASME Sec 8	SGS
V	6230	Vessel	WESP Vent Stack	PGSG	Phase 2	Flue Gas	89.5 BBL	4'-0" DIA x 40'-0" OAH	Motor	5	Atmospheric; 200°F	0	SGS

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PGTP

EQUIPMENT LIST - Revised for Permit

AERA - FIELD REDEVELOPMENT PROJECT

LEGEND for Plant Processes

COS	Clean Oil Storage	ocp	Oil Cleaning Plant	SCP	Solids Concentration Plant
CPP	Central Plant Processes	Off-Plot	Off-Plot / Fire Water	SGS	Steam Generation Site
GS	Group Station	PGSG	Produced Gas Steam Generation	WCP	Water Cleaning Plant
LOS	Light Oil Storage	PGTP	Produced Gas Treatment Plant	WSP	Water Softening Plant

Feel free to use autofilters. Warning, Performing a sort will sever links to the other sheets!

IDENTIFICATION		DESCRIPTION				EQUIPMENT INFORMATION							
Tag Identifier	Tag Number	Description short	Description Long	Process Grouping	Project Phase (timing)	Process Media	Capacity	Size	Driver Type	Horse power	Ratings (MAWP, Press/Temp, etc.)	Codes	Location
F	5910	Flare	Emergency Flare	PGTP	Phase 1	Reliefs	40.0 MMBTU/Hr	7'-0" DIA x 40'-0" Ht	NA	NA	0	0	GS
FF	5020	Fin Fan Cooler	Produced Gas Cooler	PGTP	Phase 1	Prod. Gas	0.4 MMBTU/hr	-	Motor	7.5	150 psig @ 350°F	API 661	GS
FF	5030	Fin Fan Cooler	Produced Gas Cooler	PGTP	Phase 1	Prod. Gas	0.4 MMBTU/hr	-	Motor	7.5	150 psig @ 350°F	API 661	GS
P	5890	Pump	Flare KO Condensate Pump	PGTP	Phase 1	Condensate	50 gpm @ 40 psig	-	Motor	3	40 psig @ 250°F	ANSI B73.1	GS
P	5900	Pump	Flare KO Condensate Pump	PGTP	Phase 1	Condensate	50 gpm @ 40 psig	-	Motor	3	40 psig @ 250°F	ANSI B73.1	GS
P	5980	Pump	Sweet Gas Scrubber Condensate Pump	PGTP	Phase 1	Condensate	15 gpm @ 40 psig	-	Motor	1.5	40 psig @ 250°F	ANSI B73.1	GS
P	5990	Pump	Sweet Gas Scrubber Condensate Pump	PGTP	Phase 1	Condensate	15 gpm @ 40 psig	-	Motor	1.5	40 psig @ 250°F	ANSI B73.1	GS
V	5010	Vessel	Warm Gas Scrubber	PGTP	Phase 1	Prod. Gas	1.5 MMSCFD	3'-0" DIA x 15'-0" s/s	NA	NA	150 psig @ 350°F	ASME Sec 8	GS
V	5040	Vessel	Cooled Gas Scrubber	PGTP	Phase 1	Prod. Gas	2.5 MMSCFD	2'-6" DIA x 10'-0" s/s	NA	NA	150 psig @ 350°F	ASME Sec 8	GS
V	5660	Vessel	H2S Scavenger 2	PGTP	Phase 1	Produced Gas	2.0 MMSCFD	12'-0" DIA x 30'-0" s/s	NA	NA	150 psig @ 250°F	ASME Sec 8	GS
V	5670	Vessel	H2S Scavenger 1	PGTP	Phase 1	Produced Gas	2.0 MMSCFD	12'-0" DIA x 30'-0" s/s	NA	NA	150 psig @ 250°F	ASME Sec 8	GS
V	5880	Vessel	Flare KO Vessel	PGTP	Phase 1	Reliefs	2.0 MMSCFD	5'-0" DIA x 15'-0" s/s	NA	NA	150 psig @ 350°F	ASME Sec 8	GS
V	5970	Vessel	Sweet Produced Gas Scrubber	PGTP	Phase 1	Sweet Gas	2.0 MMSCFD	3'-0" DIA x 9'-0" s/s	NA	NA	150 psig @ 350°F	ASME Sec 8	GS
F	5810	Filter	SFX Sulfur Filter	PGTP	Phase 2	SFX Slurry	85 gpm	by vendor	Motor	-	by vendor	0	GS
F	5870	Filter	SFX Sulfur Filter	PGTP	Phase 2	SFX Slurry	85 gpm	by vendor	Motor	-	by vendor	0	GS
FF	5630	Fin Fan Cooler	SFX Regeneration Air Cooler	PGTP	Phase 2	Air	0.08 MMBTU/hr	-	VFD	5	30 psig @ 400°F	API 661	GS
HX	5520	Heat Exchanger	SFX Water Wash S/T Heater	PGTP	Phase 2	Water	0.82MMBTU/hr	-	NA	NA	Design SH:150 psig T:150 psig ; 350°F	ASME Sec 8	GS
HX	5710	Exchanger	SFX Heat Medium Heater	PGTP	Phase 2	SFX Heat Medium	1.13 MMBTU/hr	-	NA	NA	Design SH:150 psig T:150 psig ; 350°F	ASME Sec 8	GS
HX	5720	Exchanger	SFX Solution Heaters	PGTP	Phase 2	SFX Heat Medium	1.13 MMBTU/hr	-	NA	NA	Design SH:150 psig T:150 psig ; 350°F	ASME Sec 8	GS
HX	5730	Exchanger	SFX Solution Heaters	PGTP	Phase 2	SFX Heat Medium	1.13 MMBTU/hr	-	NA	NA	Design SH:150 psig T:150 psig ; 350°F	ASME Sec 8	GS
K	5640	Blower	SFX Regeneration Air Blowers	PGTP	Phase 2	Air	300 scfm	-	Motor	50	15 psig @ 400°F	0	GS
K	5650	Blower	SFX Regeneration Air Blowers	PGTP	Phase 2	Air	300 scfm	-	Motor	50	15 psig @ 400°F	0	GS
K	5930	Blower	SFX Sulfur Filter Exhaust	PGTP	Phase 2	Air	By Vendor	-	Motor	0	0	0	GS
K	5940	Blower	SFX Sulfur Filter Exhaust	PGTP	Phase 2	Air	By Vendor	-	Motor	0	0	0	GS
P	5110	Pump	SFX Inventory Return Pump	PGTP	Phase 2	SFX Chemicals	200 gpm @ 87 ft.	-	Motor	10	40 psig @ 250°F	ANSI B73.1	GS
P	5140	Pump	SFX Iron Chelate Metering Pump	PGTP	Phase 2	SFX Chemicals	2.5 GPH	-	VFD	0.25	40 psig @ 250°F	API 675	GS
P	5150	Pump	SFX Iron Chelate Metering Pump	PGTP	Phase 2	SFX Chemicals	2.5 GPH	-	VFD	0.25	40 psig @ 250°F	API 675	GS
P	5170	Pump	SFX Caustic pH Metering Pump	PGTP	Phase 2	SFX Chemicals	2.0 GPH	-	VFD	0.25	40 psig @ 250°F	API 675	GS
P	5190	Pump	SFX Inhibitor Metering Pump	PGTP	Phase 2	SFX Chemicals	1.0 GPH	-	VFD	0.25	40 psig @ 250°F	API 675	GS
P	5210	Pump	SFX De-Foamer Metering Pump	PGTP	Phase 2	SFX Chemicals	0.08 GPH	-	VFD	0.25	40 psig @ 250°F	API 675	GS
P	5220	Pump	SFX De-Foamer Metering Pump	PGTP	Phase 2	SFX Chemicals	0.08 GPH	-	VFD	0.25	40 psig @ 250°F	API 675	GS
P	5240	Pump	SFX Detergent Metering Pump	PGTP	Phase 2	SFX Chemicals	0.04 GPH	-	VFD	0.25	40 psig @ 250°F	API 675	GS
P	5250	Pump	SFX Detergent Metering Pump	PGTP	Phase 2	SFX Chemicals	0.04 GPH	-	VFD	0.25	40 psig @ 250°F	API 675	GS
P	5270	Pump	SFX Calcium Nitrate Metering Pump	PGTP	Phase 2	SFX Chemicals	0.04 GPH	-	VFD	0.25	40 psig @ 250°F	API 675	GS
P	5530	Pump	SFX Wash Water Circ./Purge Pump	PGTP	Phase 2	Water	110 gpm @ 45 psig	-	Motor	7.5	45 psig @ 250°F	ANSI B73.1	GS
P	5540	Pump	SFX Wash Water Circ./Purge Pump	PGTP	Phase 2	Water	110 gpm @ 45 psig	-	Motor	7.5	45 psig @ 250°F	ANSI B73.1	GS
P	5680	Pump	SFX Treated Gas Scrubber Pump	PGTP	Phase 2	SFX Liquids	50 gpm @ 13 psig	-	Motor	2	13 psig @ 250°F	ANSI B73.1	GS
P	5690	Pump	SFX Treated Gas Scrubber Pump	PGTP	Phase 2	SFX Liquids	50 gpm @ 13 psig	-	Motor	2	13 psig @ 250°F	ANSI B73.1	GS
P	5740	Pump	SFX Heater Pump	PGTP	Phase 2	SFX Heat Medium	170 gpm @ 86 ft.	2x3-6; 5.00 imp	Motor	10	40 psig @ 250°F	ANSI B73.1	GS
P	5750	Pump	SFX Heater Pump	PGTP	Phase 2	SFX Heat Medium	170 gpm @ 86 ft.	2x3-6; 5.00 imp	Motor	10	40 psig @ 250°F	ANSI B73.1	GS
P	5760	Pump	SFX Solution Circulation Pumps	PGTP	Phase 2	SFX Solution	360 gpm @ 125 ft.	3x4-9; 7.4" imp	Motor	50	55 psig @ 250°F	ANSI B73.1	GS
P	5770	Pump	SFX Solution Circulation Pumps	PGTP	Phase 2	SFX Solution	360 gpm @ 125 ft.	3x4-9; 7.4" imp	Motor	50	55 psig @ 250°F	ANSI B73.1	GS
P	5780	Pump	SFX Slurry Pumps	PGTP	Phase 2	SFX Slurry	95 gpm @ 96 ft.	1.5x3-6; 5" imp	Motor	10	45 psig @ 250°F	ANSI B73.1	GS
P	5790	Pump	SFX Slurry Pumps	PGTP	Phase 2	SFX Slurry	95 gpm @ 96 ft.	1.5x3-6; 5" imp	Motor	10	45 psig @ 250°F	ANSI B73.1	GS
P	5830	Pump	SFX Filtrate Pumps	PGTP	Phase 2	SFX Filtrate	115 gpm @ 161 ft.	1.5x3-6; 4.375 imp	Motor	10	70 psig @ 250°F	ANSI B73.1	GS
P	5840	Pump	SFX Filtrate Pumps	PGTP	Phase 2	SFX Filtrate	115 gpm @ 161 ft.	1.5x3-6; 4.375 imp	Motor	10	70 psig @ 250°F	ANSI B73.1	GS
T	5100	Tank	SFX Inventory Storage Tank	PGTP	Phase 2	SFX Chemicals	10,300 gallons	12'-0" DIA x 14'-4"	NA	NA	Atmospheric; Poly Tank	ASME RTP-1	GS
T	5120	Tank	SFX Iron Chelate Make-up Tank	PGTP	Phase 2	SFX Chemicals	8,000 gallons	12'-0" DIA x 11'-11"	NA	NA	Atmospheric; Poly Tank	ASME RTP-1	GS
T	5130	Tank	SFX Iron Chelate Make-up Tank	PGTP	Phase 2	SFX Chemicals	8,000 gallons	12'-0" DIA x 11'-11"	NA	NA	Atmospheric; Poly Tank	ASME RTP-1	GS
T	5160	Tank	SFX Caustic Tank	PGTP	Phase 2	SFX Chemicals	2,000 gallons	7'-5" DIA x 7'-5"	NA	NA	Atmospheric; Poly Tank	ASME RTP-1	GS
T	5180	Tank	SFX Inhibitor Tank	PGTP	Phase 2	SFX Chemicals	2,000 gallons	7'-5" DIA x 7'-5"	NA	NA	Atmospheric; Poly Tank	ASME RTP-1	GS
T	5200	Tank	SFX Defoamer Tank	PGTP	Phase 2	SFX Chemicals	255 gallons	3'-6" x 3'-6" x 3'-6"	NA	NA	Atmospheric; S/S Tote	UN/DOT	GS
T	5230	Tank	SFX Detergent Tank	PGTP	Phase 2	SFX Chemicals	255 gallons	3'-6" x 3'-6" x 3'-6"	NA	NA	Atmospheric; S/S Tote	UN/DOT	GS
T	5260	Tank	SFX Calcium Nitrate Tank	PGTP	Phase 2	SFX Chemicals	255 gallons	3'-6" x 3'-6" x 3'-6"	NA	NA	Atmospheric; S/S Tote	UN/DOT	GS
T	5820	Tank	SFX Filtrate Tank	PGTP	Phase 2	SFX Filtrate	2,300 gallons	8'-0" DIA x 6'-0"	NA	NA	Atmospheric; 120°F	ASME RTP-1	GS
V	5510	Vessel	SFX Water Wash Column	PGTP	Phase 2	Sour Gas	2.0 MMSCFD	42" ID x 30'-0" s/s	NA	NA	100 psig @ 250°F	ASME Sec 8	GS
V	5550	Vessel	SFX Wash Water Filter Separator	PGTP	Phase 2	Water	330 gal	30" ID x 9'-0" s/s	NA	NA	100 psig @ 300°F	ASME Sec 8	GS
V	5600	Vessel	SFX Treated Gas Scrubber	PGTP	Phase 2	Sweet Gas	0	42" ID x 10'-0" s/s	NA	NA	100 psig @ 250°F	ASME Sec 8	GS
V	5610	Vessel	SFX Gas Sparge Tower	PGTP	Phase 2	Sweet Gas	0	90" ID x 40'-0" s/s	NA	NA	100 psig @ 250°F	ASME Sec 8	GS
V	5620	Vessel	SFX Regenerator	PGTP	Phase 2	SFX Solution	0	72" ID x 20'-0" s/s	NA	NA	30 psig @ 375°F	ASME Sec 8	GS
V	5700	Vessel	SFX Heat Media Surge Drum	PGTP	Phase 2	SFX Heat Medium	425 Gal	36" ID x 8'-0" s/s	NA	NA	50 psig @ 250°F	ASME Sec 8	GS
V	5800	Vessel	SFX Surge Tank	PGTP	Phase 2	SFX Solution	9,250 Gal	90" ID x 28'-0" s/s	Motor	0.75	30 psig @ 250°F	ASME Sec 8	GS

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SCP

EQUIPMENT LIST - Revised for Permit

AERA - FIELD REDEVELOPMENT PROJECT

LEGEND for Plant Processes

COS	Clean Oil Storage	ocp	Oil Cleaning Plant	SCP	Solids Concentration Plant
CPP	Central Plant Processes	Off-Plot	Off-Plot / Fire Water	SGS	Steam Generation Site
GS	Group Station	PGSG	Produced Gas Steam Generation	WCP	Water Cleaning Plant
LOS	Light Oil Storage	PGTP	Produced Gas Treatment Plant	WSP	Water Softening Plant

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IDENTIFICATION		DESCRIPTION				EQUIPMENT INFORMATION							
Tag Identifier	Tag Number	Description short	Description Long	Process Grouping	Project Phase (timing)	Process Media	Capacity	Size	Driver Type	Horse power	Ratings (MAWP, Press/Temp, etc.)	Codes	Location
CF	7060	Centrifuge	Sludge Liquid Desanding	SCP	Phase 1	Oily Solids	30 GPM	89" L x 44" W x 27" H	VFD	20	30 psig @ 250°F	0	CPF
HX	7330	Heat Exchanger	Emulsion/Steam S/T Exchanger	SCP	Phase 1	Emulsion	0	-	NA	NA	250 psig @ 400°F	ASME Sec 8	CPF
P	7040	Pump	Centrifuge Feed Pump	SCP	Phase 1	Oily Solids	35 gpm @ 30 psig	-	VFD	2	30 psig @ 250°F	API 676	CPF
P	7050	Pump	Centrifuge Feed Pump	SCP	Phase 1	Oily Solids	35 gpm @ 30 psig	-	VFD	2	30 psig @ 250°F	API 676	CPF
P	7080	Pump	Skim Oil Tank Oil Transfer Pump	SCP	Phase 1	Emulsion	50 gpm @ 45 psig	-	VFD	2	45 psig @ 250°F	API 676	CPF
P	7090	Pump	Skim Oil Tank Oil Transfer Pump	SCP	Phase 1	Emulsion	50 gpm @ 45 psig	-	VFD	2	45 psig @ 250°F	API 676	CPF
P	7100	Pump	Skim Oil Tank Water Transfer Pump	SCP	Phase 1	Produced Water	150 gpm @ 30 psig	-	Motor	7.5	45 psig @ 250°F	ANSI B73.1	CPF
P	7110	Pump	Skim Oil Tank Water Transfer Pump	SCP	Phase 1	Produced Water	150 gpm @ 30 psig	-	Motor	7.5	45 psig @ 250°F	ANSI B73.1	CPF
T	7030	Sludge Tank	Sludge Separation Tank	SCP	Phase 1	Oily Solids	1,000 BBL	-6" DIA x 16'-0" (w/7'-0" Col	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
T	7070	Skim Oil Tank	Skim Oil Tank	SCP	Phase 1	Skim Oil	1,000 BBL	21'-6" DIA x 16'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
V	7340	Electrostatic Coalescer	Flash Treater Horizontal Vessel	SCP	Phase 1	Emulsion	48 BPD	12'-0" DIA x 60'-0" S/S	NA	NA	250 psig @ 400°F	ASME Sec 8	CPF
CF	7170	Centrifuge	Sludge Liquid Desanding	SCP	Phase 2	Oily Solids	30 GPM	89" L x 44" W x 27" H	VFD	20	30 psig @ 250°F	-	CPF
P	7150	Pump	Centrifuge Feed Charge Pump	SCP	Phase 2	Oily Solids	35 gpm @ 30 psig	-	VFD	2	30 psig @ 250°F	API 676	CPF
P	7160	Pump	Centrifuge Feed Charge Pump	SCP	Phase 2	Oily Solids	35 gpm @ 30 psig	-	VFD	2	30 psig @ 250°F	API 676	CPF
P	7190	Pump	Skim Oil Tank Oil Transfer Pump	SCP	Phase 2	Emulsion	50 gpm @ 45 psig	-	VFD	2	45 psig @ 250°F	API 676	CPF
P	7200	Pump	Skim Oil Tank Oil Transfer Pump	SCP	Phase 2	Emulsion	50 gpm @ 45 psig	-	VFD	2	45 psig @ 250°F	API 676	CPF
P	7210	Pump	Skim Oil Tank Water Transfer Pump	SCP	Phase 2	Produced Water	150 gpm @ 30 psig	-	Motor	7.5	45 psig @ 250°F	ANSI B73.1	CPF
P	7220	Pump	Skim Oil Tank Water Transfer Pump	SCP	Phase 2	Produced Water	150 gpm @ 30 psig	-	Motor	7.5	45 psig @ 250°F	ANSI B73.1	CPF
T	7140	Sludge Tank	Sludge Separation Tank	SCP	Phase 2	Oily Solids	1,000 BBL	-6" DIA x 16'-0" (w/7'-0" Col	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
T	7180	Skim Oil Tank	Skim Oil Tank	SCP	Phase 2	Skim Oil	1,000 BBL	21'-6" DIA x 16'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF

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Rev: E2

SGS

EQUIPMENT LIST - Revised for Permit

AERA - FIELD REDEVELOPMENT PROJECT

LEGEND for Plant Processes

COS	Clean Oil Storage	ocp	Oil Cleaning Plant	SCP	Solids Concentration Plant
CPP	Central Plant Processes	Off-Plot	Off-Plot / Fire Water	SGS	Steam Generation Site
GS	Group Station	PGSG	Produced Gas Steam Generation	WCP	Water Cleaning Plant
LOS	Light Oil Storage	PGTP	Produced Gas Treatment Plant	WSP	Water Softening Plant

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IDENTIFICATION		DESCRIPTION				EQUIPMENT INFORMATION							
Tag Identifier	Tag Number	Description short	Description Long	Process Grouping	Project Phase (timing)	Process Media	Capacity	Size	Driver Type	Horse power	Ratings (MAWP, Press/Temp, etc.)	Codes	Location
HX	8110	Heat Exchanger	Feedwater Pre-Heater	SGS	Phase 1	Water	5.2 MMBTU/HR	-	NA	NA	Design SH:150 psig T:2,600 psig ; 300°F	ASME Sec 8	SGS
HX	8210	Heat Exchanger	Feedwater Pre-Heater	SGS	Phase 1	Water	5.2 MMBTU/HR	-	NA	NA	Design SH:150 psig T:2,600 psig ; 300°F	ASME Sec 8	SGS
HX	8310	Heat Exchanger	Feedwater Pre-Heater	SGS	Phase 1	Water	5.2 MMBTU/HR	-	NA	NA	Design SH:150 psig T:2,600 psig ; 300°F	ASME Sec 8	SGS
K	8750	Air Compressor	Instrument Air Skid	SGS	Phase 1	Air	115 ACFM @ 125 psi	-	Motor	30	125 psig @ 100°F	0	SGS
K	8810	Air Compressor	Instrument Air Skid	SGS	Phase 1	Air	115 ACFM @ 125 psi	-	Motor	30	125 psig @ 100°F	0	SGS
P	8100	Feedwater Pump	Steam Generator Feed Pump	SGS	Phase 1	Water	9,900 BPD @ 2600 PSIG	-	VFD	350	2,600 psig @ 200°F	API 674	SGS
P	8200	Feedwater Pump	Steam Generator Feed Pump	SGS	Phase 1	Water	9,900 BPD @ 2600 PSIG	-	VFD	350	2,600 psig @ 200°F	API 674	SGS
P	8300	Feedwater Pump	Steam Generator Feed Pump	SGS	Phase 1	Water	9,900 BPD @ 2600 PSIG	-	VFD	350	2,600 psig @ 200°F	API 674	SGS
P	8720	Pump	Drain Tank Pump	SGS	Phase 1	Condensate	100 gpm @ 70 psig	-	Motor	10	30 psig @ 250°F	API 676	SGS
P	8730	Pump	Drain Tank Pump	SGS	Phase 1	Condensate	100 gpm @ 70 psig	-	Motor	10	30 psig @ 250°F	API 676	SGS
P	8740	Pump	Drain Tank Sump Pump	SGS	Phase 1	Condensate	20 gpm @ 10 psig	-	Motor	1	30 psig @ 250°F	API 676	SGS
SG	8120	Steam Generator	Steam Generator Skid	SGS	Phase 1	Steam	85 MMBTU/HR	-	VFD	150	2,600 psig @ 675°F	ASME Sec1	SGS
SG	8220	Steam Generator	Steam Generator Skid	SGS	Phase 1	Steam	85 MMBTU/HR	-	VFD	150	2,600 psig @ 675°F	ASME Sec1	SGS
SG	8320	Steam Generator	Steam Generator Skid	SGS	Phase 1	Steam	85 MMBTU/HR	-	VFD	150	2,600 psig @ 675°F	ASME Sec1	SGS
V	8010	Separator	Fuel Gas Scrubber	SGS	Phase 1	Fuel Gas	12 MMSCFD	4'-0" DIA x 12'-0" S/S	NA	NA	MAWP: 350 psig @ 250 F	ASME Sec 8	SGS
V	8710	Separator	Blowdown/Drain Tank	SGS	Phase 1	Fuel Gas	100 BBL	6'-0" DIA x 20'-0" S/S	NA	NA	MAWP: 15 psig @ 250 F	ASME Sec 8	SGS
V	8780	Air Receiver	Instrument Air Receiver	SGS	Phase 1	Air	400 gal	36" dia x 80" s/s	NA	NA	200 psig @ 200°F	ASME Sec 8	SGS
V	8790	Air Dryer	Instrument Air Dryer	SGS	Phase 1	Air	250 ACFM	-	NA	NA	200 psig @ 200°F	ASME Sec 8	SGS
V	8800	Air Dryer	Instrument Air Dryer	SGS	Phase 1	Air	250 ACFM	-	NA	NA	200 psig @ 200°F	ASME Sec 8	SGS
HX	8410	Heat Exchanger	Feedwater Pre-Heater	SGS	Phase 2	Water	5.2 MMBTU/HR	-	NA	NA	Design SH:150 psig T:2,600 psig ; 300°F	ASME Sec 8	SGS
HX	8510	Heat Exchanger	Feedwater Pre-Heater	SGS	Phase 2	Water	5.2 MMBTU/HR	-	NA	NA	Design SH:150 psig T:2,600 psig ; 300°F	ASME Sec 8	SGS
HX	8610	Heat Exchanger	Feedwater Pre-Heater	SGS	Phase 2	Water	5.2 MMBTU/HR	-	NA	NA	Design SH:150 psig T:2,600 psig ; 300°F	ASME Sec 8	SGS
P	8400	Feedwater Pump	Steam Generator Feed Pump	SGS	Phase 2	Water	9,900 BPD @ 2600 PSIG	-	VFD	350	2,600 psig @ 200°F	API 674	SGS
P	8500	Feedwater Pump	Steam Generator Feed Pump	SGS	Phase 2	Water	9,900 BPD @ 2600 PSIG	-	VFD	350	2,600 psig @ 200°F	API 674	SGS
P	8600	Feedwater Pump	Steam Generator Feed Pump	SGS	Phase 2	Water	9,900 BPD @ 2600 PSIG	-	VFD	350	2,600 psig @ 200°F	API 674	SGS
SG	8420	Steam Generator	Steam Generator Skid	SGS	Phase 2	Steam	85 MMBTU/HR	-	VFD	150	2,600 psig @ 675°F	ASME Sec1	SGS
SG	8520	Steam Generator	Steam Generator Skid	SGS	Phase 2	Steam	85 MMBTU/HR	-	VFD	150	2,600 psig @ 675°F	ASME Sec1	SGS
SG	8620	Steam Generator	Steam Generator Skid	SGS	Phase 2	Steam	85 MMBTU/HR	-	VFD	150	2,600 psig @ 675°F	ASME Sec1	SGS

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Rev: E2

WCP

EQUIPMENT LIST - Revised for Permit

AERA - FIELD REDEVELOPMENT PROJECT

LEGEND for Plant Processes

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IDENTIFICATION		DESCRIPTION				EQUIPMENT INFORMATION							
Tag Identifier	Tag Number	Description short	Description Long	Process Grouping	Project Phase (timing)	Process Media	Capacity	Size	Driver Type	Horse power	Ratings (MAWP, Press/Temp, etc.)	Codes	Location
F	3230	Filter	Deep Bed Filter	WCP	Phase 1	Water	29,000 BPD	9'-0" DIA x 9'-0" S/S	Motor	40	150 psig @ 200°F	ASME Sec 8	CPF
F	3240	Filter	Deep Bed Filter	WCP	Phase 1	Water	29,000 BPD	9'-0" DIA x 9'-0" S/S	Motor	40	150 psig @ 200°F	ASME Sec 8	CPF
FF	3010	Fin Fan Cooler	Produced Water Cooler	WCP	Phase 1	Water	11.4 MMBTU/hr	14'-0" x 14'-0"	VFD	20	150 psig @ 260°F	API 661	CPF
FF	3020	Fin Fan Cooler	Produced Water Cooler	WCP	Phase 1	Water	11.4 MMBTU/hr	14'-0" x 14'-0"	VFD	20	150 psig @ 260°F	API 661	CPF
P	3040	Pump	IGF Charge Pump	WCP	Phase 1	Water	875 gpm @ 20 psig	-	VFD	30	20 psig @ 250°F	ANSI B73.1	CPF
P	3050	Pump	IGF Charge Pump	WCP	Phase 1	Water	875 gpm @ 20 psig	-	VFD	30	20 psig @ 250°F	ANSI B73.1	CPF
P	3070	Pump	IGF Eductor Pump	WCP	Phase 1	Water	350 gpm @ 60 psig	-	Motor	25	60 psig @ 250°F	ANSI B73.1	CPF
P	3080	Pump	IGF Eductor Pump	WCP	Phase 1	Water	350 gpm @ 60 psig	-	Motor	25	60 psig @ 250°F	ANSI B73.1	CPF
P	3210	Pump	Filter Feed Pump	WCP	Phase 1	Water	730 gpm @ 65 psig	-	VFD	50	65 psig @ 250°F	ANSI B73.1	CPF
P	3220	Pump	Filter Feed Pump	WCP	Phase 1	Water	730 gpm @ 65 psig	-	VFD	50	65 psig @ 250°F	ANSI B73.1	CPF
P	3250	Pump	Desander Pump	WCP	Phase 1	Water	150 gpm @ 100 psig	-	Motor	25	100 psig @ 250°F	ANSI B73.1	CPF
P	3260	Pump	Desander Pump	WCP	Phase 1	Water	150 gpm @ 100 psig	-	Motor	25	100 psig @ 250°F	ANSI B73.1	CPF
P	3410	Pump	Softener Feed Pump	WCP	Phase 1	Water	550 gpm @ 80 psig	-	VFD	50	80 psig @ 250°F	ANSI B73.1	CPF
P	3420	Pump	Softener Feed Pump	WCP	Phase 1	Water	550 gpm @ 80 psig	-	VFD	50	80 psig @ 250°F	ANSI B73.1	CPF
P	3440	Pump	Backwash Skim Pump	WCP	Phase 1	Water	550 gpm @ 40 psig	-	VFD	25	40 psig @ 250°F	ANSI B73.1	CPF
T	3030	Tank	Clarifier Tank	WCP	Phase 1	Water	5,000 BBL	38'-8" DIA x 24'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
T	3200	Tank	Filter Feed Tank	WCP	Phase 1	Water	5,000 BBL	38'-8" DIA x 24'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
T	3400	Tank	Filtered Water Tank	WCP	Phase 1	Water	5,000 BBL	38'-8" DIA x 24'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
T	3430	Tank	Filter Backwash Tank	WCP	Phase 1	Water	500 BBL	5" DIA x 16' w/6' Cone (24' C	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
V	3060	Vessel	IGF Unit	WCP	Phase 1	Water	30,000 BPD	6'-0" DIA x 24'-0" S/S	NA	NA	50 psig @ 250°F	ASME Sec 8	CPF
F	3330	Filter	Deep Bed Filter	WCP	Phase 2	Water	29,000 BPD	9'-0" DIA x 9'-0" S/S	Motor	40	150 psig @ 200°F	ASME Sec 8	CPF
F	3340	Filter	Deep Bed Filter	WCP	Phase 2	Water	29,000 BPD	9'-0" DIA x 9'-0" S/S	Motor	40	150 psig @ 200°F	ASME Sec 8	CPF
FF	3110	Fin Fan Cooler	Produced Water Cooler	WCP	Phase 2	Water	11.4 MMBTU/hr	14'-0" x 14'-0"	VFD	20	150 psig @ 260°F	API 661	CPF
FF	3120	Fin Fan Cooler	Produced Water Cooler	WCP	Phase 2	Water	11.4 MMBTU/hr	14'-0" x 14'-0"	VFD	20	150 psig @ 260°F	API 661	CPF
P	3140	Pump	IGF Charge Pump	WCP	Phase 2	Water	875 gpm @ 20 psig	-	VFD	30	20 psig @ 250°F	ANSI B73.1	CPF
P	3150	Pump	IGF Charge Pump	WCP	Phase 2	Water	875 gpm @ 20 psig	-	VFD	30	20 psig @ 250°F	ANSI B73.1	CPF
P	3170	Pump	IGF Eductor Pump	WCP	Phase 2	Water	350 gpm @ 60 psig	-	Motor	25	60 psig @ 250°F	ANSI B73.1	CPF
P	3180	Pump	IGF Eductor Pump	WCP	Phase 2	Water	350 gpm @ 60 psig	-	Motor	25	60 psig @ 250°F	ANSI B73.1	CPF
P	3310	Pump	Filter Feed Pump	WCP	Phase 2	Water	730 gpm @ 65 psig	-	VFD	50	65 psig @ 250°F	ANSI B73.1	CPF
P	3320	Pump	Filter Feed Pump	WCP	Phase 2	Water	730 gpm @ 65 psig	-	VFD	50	65 psig @ 250°F	ANSI B73.1	CPF
P	3350	Pump	Desander Pump	WCP	Phase 2	Water	150 gpm @ 100 psig	-	Motor	25	100 psig @ 250°F	ANSI B73.1	CPF
P	3360	Pump	Desander Pump	WCP	Phase 2	Water	150 gpm @ 100 psig	-	Motor	25	100 psig @ 250°F	ANSI B73.1	CPF
P	3510	Pump	Softener Feed Pump	WCP	Phase 2	Water	550 gpm @ 80 psig	-	VFD	50	80 psig @ 250°F	ANSI B73.1	CPF
P	3520	Pump	Softener Feed Pump	WCP	Phase 2	Water	550 gpm @ 80 psig	-	VFD	50	80 psig @ 250°F	ANSI B73.1	CPF
P	3540	Pump	Backwash Skim Pump	WCP	Phase 2	Water	550 gpm @ 40 psig	-	VFD	25	40 psig @ 250°F	ANSI B73.1	CPF
T	3130	Tank	Clarifier Tank	WCP	Phase 2	Water	5,000 BBL	38'-8" DIA x 24'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
T	3300	Tank	Filter Feed Tank	WCP	Phase 2	Water	5,000 BBL	38'-8" DIA x 24'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
T	3500	Tank	Filtered Water Tank	WCP	Phase 2	Water	5,000 BBL	38'-8" DIA x 24'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
T	3530	Tank	Filter Backwash Tank	WCP	Phase 2	Water	500 BBL	5" DIA x 16' w/6' Cone (24' C	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
V	3160	Vessel	IGF Unit	WCP	Phase 2	Water	30,000 BPD	6'-0" DIA x 24'-0" S/S	NA	NA	50 psig @ 250°F	ASME Sec 8	CPF

Date: 1/20/16

Rev: E2

WSP

EQUIPMENT LIST - Revised for Permit

AERA - FIELD REDEVELOPMENT PROJECT

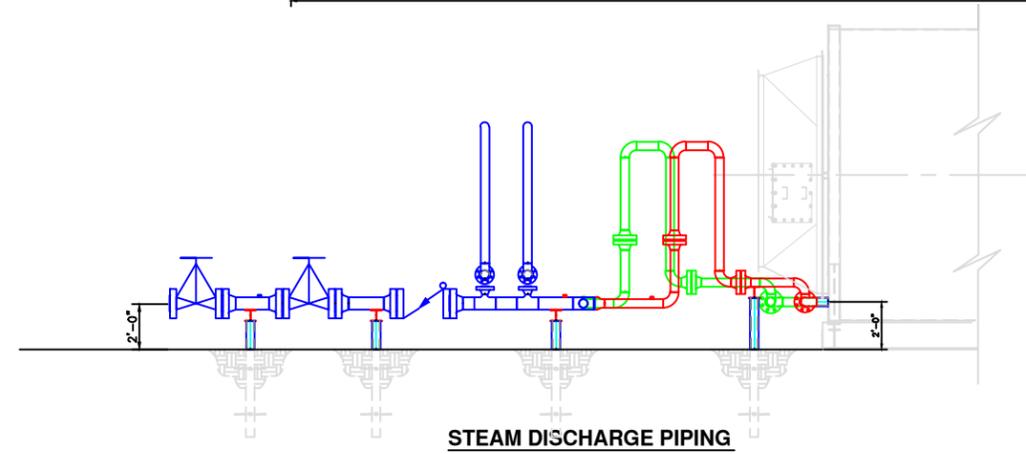
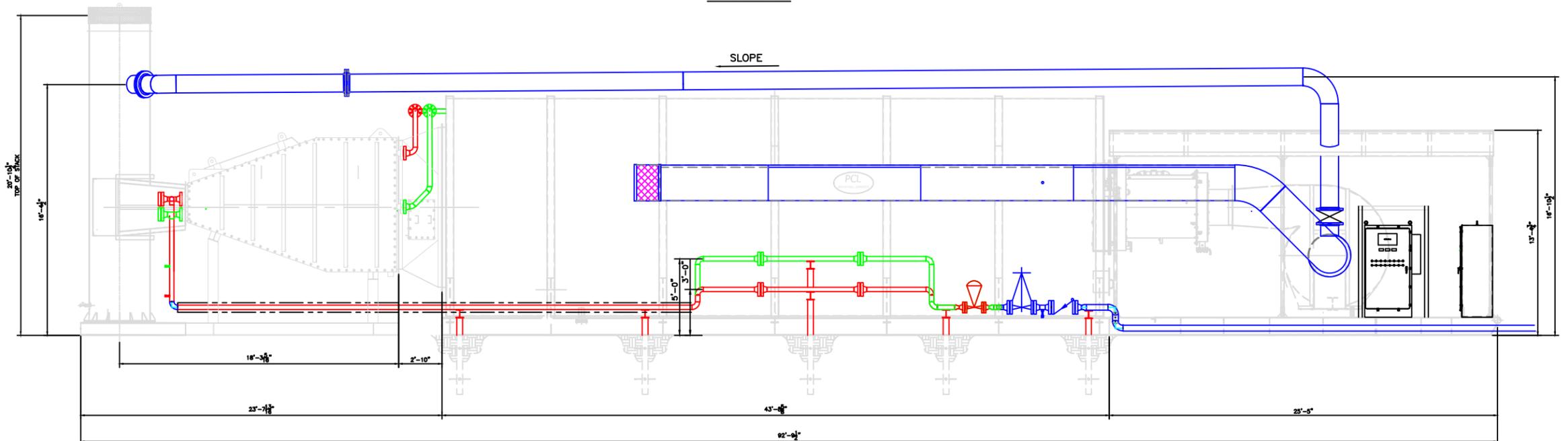
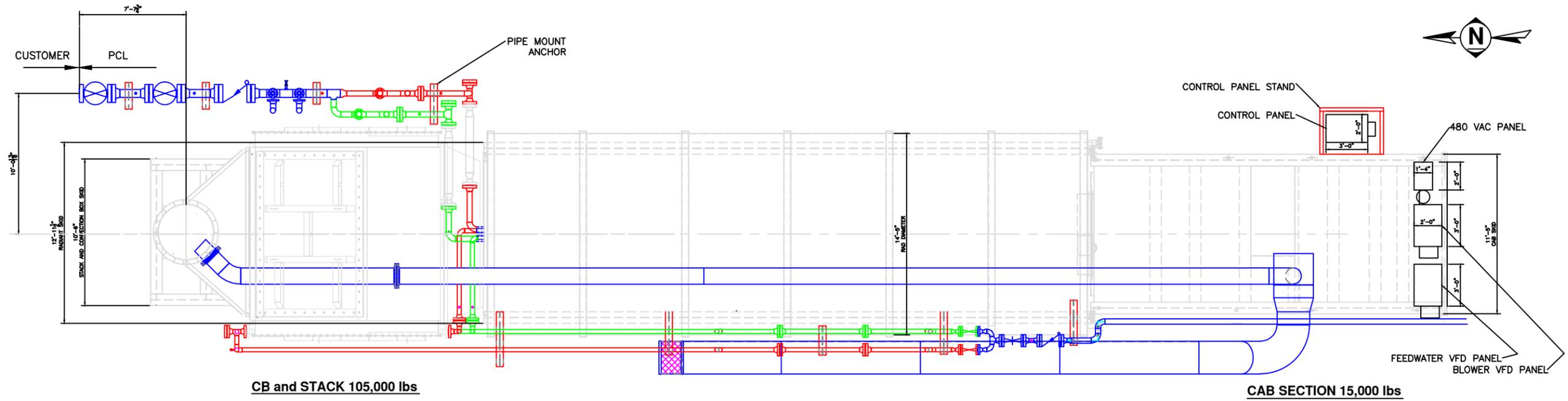
LEGEND for Plant Processes

COS	Clean Oil Storage	ocp	Oil Cleaning Plant	SCP	Solids Concentration Plant
CPP	Central Plant Processes	Off-Plot	Off-Plot / Fire Water	SGS	Steam Generation Site
GS	Group Station	PGSG	Produced Gas Steam Generation	WCP	Water Cleaning Plant
LOS	Light Oil Storage	PGTP	Produced Gas Treatment Plant	WSP	Water Softening Plant

Feel free to use autofilters. Warning, Performing a sort will sever links to the other sheets!

IDENTIFICATION		DESCRIPTION				EQUIPMENT INFORMATION							
Tag Identifier	Tag Number	Description short	Description Long	Process Grouping	Project Phase (timing)	Process Media	Capacity	Size	Driver Type	Horse power	Ratings (MAWP, Press/Temp, etc.)	Codes	Location
P	4210	Pump	Steam Plant Feed Pump	WSP	Phase 1	Water	525 gpm @ 300 psig	-	Motor	150	300 psig @ 250°F	ANSI B73.1	CPF
P	4220	Pump	Steam Plant Feed Pump	WSP	Phase 1	Water	525 gpm @ 300 psig	-	Motor	150	300 psig @ 250°F	ANSI B73.1	CPF
P	4230	Pump	Brine Make-Up/Dilution Pump	WSP	Phase 1	Water	200 gpm @ 80 psig	-	Motor	15	80 psig @ 250°F	ANSI B73.1	CPF
P	4240	Pump	Brine Make-Up/Dilution Pump	WSP	Phase 1	Water	200 gpm @ 80 psig	-	Motor	15	80 psig @ 250°F	ANSI B73.1	CPF
P	4250	Pump	Softener Backwash Pump	WSP	Phase 1	Water	800 gpm @ 60 psig	-	Motor	50	60 psig @ 250°F	ANSI B73.1	CPF
P	4260	Pump	Softener Backwash Pump	WSP	Phase 1	Water	800 gpm @ 60 psig	-	Motor	50	60 psig @ 250°F	ANSI B73.1	CPF
P	4270	Pump	Concentrated Brine Pump	WSP	Phase 1	Water	140 gpm @ 80 psig	-	Motor	15	80 psig @ 250°F	ANSI B73.1	CPF
P	4280	Pump	Concentrated Brine Pump	WSP	Phase 1	Water	140 gpm @ 80 psig	-	Motor	15	80 psig @ 250°F	ANSI B73.1	CPF
P	4610	Pump	Water Injection Pump	WSP	Phase 1	Water	12,000 BPD@1,800psig	-	VFD	500	1,800 psig @ 200°F	API 674	CPF
P	4620	Pump	Water Injection Pump	WSP	Phase 1	Water	12,000 BPD@1,800psig	-	VFD	500	1,800 psig @ 200°F	API 674	CPF
T	4200	Tank	Soft Water Tank	WSP	Phase 1	Water	10,000 BBL	55'-0" DIA x 24'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
T	4290	Tank	Brine Tank	WSP	Phase 1	Water	170 Tons Salt	14'-0" DIA x 35'-0"	NA	NA	Design: Atmospheric @ 180°F	ASME RTP-1	CPF
T	4300	Tank	Brine Tank	WSP	Phase 1	Water	170 Tons Salt	14'-0" DIA x 35'-0"	NA	NA	Design: Atmospheric @ 180°F	ASME RTP-1	CPF
T	4600	Tank	Water Injection Tank	WSP	Phase 1	Water	3,000 BBL	29'-9" DIA x 24'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
V	4010	Vessel	SAC Primary Softener Vessel	WSP	Phase 1	Water	18,500 BPD	10'-0" DIA x 11'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF
V	4020	Vessel	SAC Polisher Softener Vessel	WSP	Phase 1	Water	18,500 BPD	7'-0" DIA x 11'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF
V	4030	Vessel	SAC Primary Softener Vessel	WSP	Phase 1	Water	18,500 BPD	10'-0" DIA x 11'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF
V	4040	Vessel	SAC Polisher Softener Vessel	WSP	Phase 1	Water	18,500 BPD	7'-0" DIA x 11'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF
V	4050	Vessel	WAC Polisher Softener Vessel	WSP	Phase 1	Water	18,500 BPD	7'-0" DIA x 9'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF
V	4060	Vessel	WAC Polisher Softener Vessel	WSP	Phase 1	Water	18,500 BPD	7'-0" DIA x 9'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF
P	4410	Pump	Steam Plant Feed Pump	WSP	Phase 2	Water	525 gpm @ 300 psig	-	Motor	150	300 psig @ 250°F	ANSI B73.1	CPF
P	4420	Pump	Steam Plant Feed Pump	WSP	Phase 2	Water	525 gpm @ 300 psig	-	Motor	150	300 psig @ 250°F	ANSI B73.1	CPF
P	4430	Pump	Brine Make-Up/Dilution Pump	WSP	Phase 2	Water	200 gpm @ 80 psig	-	Motor	15	80 psig @ 250°F	ANSI B73.1	CPF
P	4440	Pump	Brine Make-Up/Dilution Pump	WSP	Phase 2	Water	200 gpm @ 80 psig	-	Motor	15	80 psig @ 250°F	ANSI B73.1	CPF
P	4450	Pump	Softener Backwash Pump	WSP	Phase 2	Water	800 gpm @ 60 psig	-	Motor	50	60 psig @ 250°F	ANSI B73.1	CPF
P	4460	Pump	Softener Backwash Pump	WSP	Phase 2	Water	800 gpm @ 60 psig	-	Motor	50	60 psig @ 250°F	ANSI B73.1	CPF
P	4470	Pump	Concentrated Brine Pump	WSP	Phase 2	Water	140 gpm @ 80 psig	-	Motor	15	80 psig @ 250°F	ANSI B73.1	CPF
P	4480	Pump	Concentrated Brine Pump	WSP	Phase 2	Water	140 gpm @ 80 psig	-	Motor	15	80 psig @ 250°F	ANSI B73.1	CPF
V	9990	Skid	Nitrogen Storage and Vaporization Skid	WSP	Phase 2	Nitrogen	0	-	0	0	0	0	CPF
T	4400	Tank	Soft Water Tank	WSP	Phase 2	Water	10,000 BBL	55'-0" DIA x 24'-0"	NA	NA	Design: <1 psig @ 250°F	API 650	CPF
T	4490	Tank	Brine Tank	WSP	Phase 2	Water	170 Tons Salt	14'-0" DIA x 35'-0"	NA	NA	Design: Atmospheric @ 180°F	ASME RTP-1	CPF
T	4500	Tank	Brine Tank	WSP	Phase 2	Water	170 Tons Salt	14'-0" DIA x 35'-0"	NA	NA	Design: Atmospheric @ 180°F	ASME RTP-1	CPF
V	4110	Vessel	SAC Primary Softener Vessel	WSP	Phase 2	Water	18,500 BPD	10'-0" DIA x 11'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF
V	4120	Vessel	SAC Polisher Softener Vessel	WSP	Phase 2	Water	18,500 BPD	7'-0" DIA x 11'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF
V	4130	Vessel	SAC Primary Softener Vessel	WSP	Phase 2	Water	18,500 BPD	10'-0" DIA x 11'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF
V	4140	Vessel	SAC Polisher Softener Vessel	WSP	Phase 2	Water	18,500 BPD	7'-0" DIA x 11'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF
V	4150	Vessel	WAC Polisher Softener Vessel	WSP	Phase 2	Water	18,500 BPD	7'-0" DIA x 9'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF
V	4160	Vessel	WAC Polisher Softener Vessel	WSP	Phase 2	Water	18,500 BPD	7'-0" DIA x 9'-0" S/S	NA	NA	100 psig @ 239°F	ASME Sec 8	CPF

Steam Generator Specification



PRELIMINARY NOT FOR CONSTRUCTION

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PCL Industrial Services, Inc. 1500 SOUTH UNION AVENUE BAKERSFIELD, CA. 93307 TEL (861) 831-5356 FAX (861) 831-5356	
DESCRIPTION: BOILER EXTERNAL PIPING (BEP-GENERAL LAYOUT)	
CUSTOMER: AERA ENERGY LLC	
CUSTOMER'S APPROVAL SIGN.	CUSTOMER'S P.O. NO.
PCL ENG. APPROVAL SIGN.	AUTHORIZED INSPECTOR APPROVAL SIGN.
B ADDED OVERALL DIMENSIONS 12/29/10 RLS RLS A PRELIMINARY 12/20/10 RLS RLS	PROJECT NO. 6220298 DRAWING NO. 6220298-BEP REV. SHEET B 1 OF 1
REV. SCALE NONE DATE 12/20/2010	DESCRIPTION DRWN. RLS CHKD. R. SIMMONS

July 3, 2018

PCL Industrial Services, Inc
1500 South Union Ave.
Bakersfield, CA 93307

ATTENTION: Mr. Mark Pittser
Manager, Business Development

SUBJECT: Indicative emission guarantees for 85 MM Btu/h Ultra Low NOx GLE Combustion Systems

Dear Mr. Pittser,

We have revised the previously issued "Indicative Emissions Guarantee" to reflect the new requirements. The performance statements below are based on the information that you have provided in the e-mail dated March 24, 2014 and subsequent conversations with you and a team at Aera Energy on July 2, 2018. Based on this information, we can offer you an indicative emissions performance guarantee, detailed below.

Emissions guarantees have both a technical and commercial significance. On the technical front, Fives North American Combustion performs a rigorous analysis of emissions performance with every warranty we issue. General arrangement drawings, fuel analyses and intended modes of operation are all considered by this process. Likewise, a warranty represents a significant commercial obligation. Such an obligation is evaluated with other contractual terms, such as price, delivery, scope of supply and overall risk profile of the proposed contract. At this time we are able to offer PCL indicative guarantees which represent what we could agree to as a portion of a sales contract, provided all the conditions enumerated are appropriate. Indicative guarantees are not a warrantable equipment performance item associated with any specific contract or equipment order but could be "converted" later upon a formal job review process.

Thank you for providing this opportunity to demonstrate the emission performance of our ultra-low NOx GLE technology when applied to a PCL steam generator. Please feel free to contact me if there are any questions concerning this letter or if we can be of any further assistance with your current combustion equipment needs.

Sincerely,
FIVES NORTH AMERICAN COMBUSTION INC.

Ron Henry
Combustion System Sales Specialist



Indicative Performance Guarantee – 85 MMBtu/h 4231-GLE

Based on the information that PCL Industrial Services, Inc. and Aera Energy have provided for an 85 MMBtu/h horizontal steam generator, FivesNA can offer the following **Indicative Emission Levels**:

NOx

The combustion system generated NOx will be guaranteed not to exceed:

- 5 ppm (corrected to a 3% O₂ dry volume basis) over a range from 85 MMBtu/h to 34 MMBtu/h (HHV) with the fuel specified below.

CO

The combustion system generated CO will be guaranteed not to exceed:

- 25 ppm (corrected to a 3% O₂ dry volume basis) over a range from 85 MMBtu/h to 34 MMBtu/h (HHV) with the fuel specified below.

ROC

The combustion system generated ROC (non-methane Reactive Organic Compounds) will be guaranteed not to exceed:

- 4 ppm (corrected to 3% O₂) over a range from 85 MMBtu/h to 34 MMBtu/h (HHV) with the fuel specified below.

The following conditions will apply to the above indicative guarantee:

1. The target fuel/air ratio for each burner is 15% excess air which is to be mixed with 25% Flue Gas Recirculation (FGR). Final settings of excess air and FGR will be determined by FivesNA upon commissioning and will be set to achieve emissions performance guarantees.
2. The fuel will be Purchased Natural Gas fuel having a higher heating value of 1055 Btu/ft³, characterized below:

Purchased Natural Gas (So. Cal. Natural Gas)

Component	Form.	% vol
Methane	CH ₄	89.60
Ethane	C ₂ H ₆	4.57
Propane	C ₃ H ₈	1.98
i-Butane	C ₄ H ₁₀	0.14
n-Butane	C ₄ H ₁₀	0.21
i-Petane	C ₅ H ₁₂	0.08
n-Petane	C ₅ H ₁₂	0.04
Hexane Plus	C ₆ +	0.02
Nitrogen	N ₂	0.31
Carbon Dioxide	CO ₂	3.05
Total		100
HHV	Btu/scf	1055
LHV	Btu/scf	953
SG		0.634
Wobbe Index		1325



3. The process temperature will not exceed 1600 °F.
4. A reaction chamber will be mounted in a horizontal steam generator with a radiant section tube ID of at least 10'-4" and a length of 42'.
5. Combustion air temperature will be 30°F to 115°F. The FGR temperature is estimated to be 240 °F and limited to no greater than 250 °F.
6. Combustion system control will include the latest version of the proprietary patented algorithms (8379-CMS-EMB-SW4 or higher) and a fully functional "mass flow control" fuel and air ratio system.
7. The emissions data will be obtained from a sample port at a point within the steam generator exhaust gas stack.
8. The test data will be extracted from a single point and time averaged.
9. FivesNA will verify all emission levels noted above following start-up when the operating mode of the burner and combustion system is at steady state and absent of any pressure spikes in either the field supply or duct systems. Our standard service rates outlined in our Sheet M9P-S will apply. If no further testing is conducted as outlined in the attached **CONDITION AND LIMITS OF FIVES NORTH AMERICAN COMBUSTION. INC. ("FIVESNA") EMISSIONS LEVELS GUARANTEE (GRM12)**, this test will be sufficient to satisfy the guarantee.
10. A chemiluminescent NOx analyzer or other device suitable for measuring ultra-low NOx emission levels, supplied by others, must be made available to FivesNA at time of start-up.

No formal process or emissions guarantees are offered at this time. Warranties are only offered as part of an actionable, firm price proposal. All warranty issues will be addressed per FivesNA's Conditions and Limits and/or Standard Terms and Conditions which are attached.



Indicative Performance Estimate – 85 MMBtu/h 4231-GLE

With respect to the expected emissions levels for Particulate Matter emissions, we offer the following:

PM-10

The 4231-GLE burner is not an appreciable source of particulate matter (PM-10) during normal gas-fired operation. Particulate can be introduced into the system in several ways such as poor inlet air filtering, particulate or condensable-laden fuel gas, and in some cases by the process itself. FivesNA cannot guarantee total stack particulate levels due to these and other factors that are outside of our control or influence. We can, however, estimate that the combustion system, firing with clean air and purchased natural gas (as described above), operating at the design ratio condition of 15% excess air, will produce less than 0.0007 lb/MMBtu of particulate. This estimate is based on performance testing of similar systems in the San Joaquin Valley as well as literature, publications, and academic sources where particulate has been measured from gas combustion systems.



**CONDITIONS AND LIMITS
OF
FIVES NORTH AMERICAN COMBUSTION, INC. ("FivesNA")
EMISSIONS LEVELS GUARANTEE**

September 2010

**Any change in data or the process variables specific to this application,
or failure to comply with any of the conditions and limits specified below,
voids this guarantee.**

**The term "as specified," as used throughout this document, refers to the specification
contained in the original quotation, and any subsequent changes for the same
application as are made or agreed to in writing by FivesNA.**

1. Firing chamber temperature must be as specified. This temperature is defined as that indicated by a thermocouple inserted into the firing chamber to a distance sufficient to eliminate refractory gradient error.
2. Flame envelope must neither be obstructed by other surfaces in the firing chamber nor intersected by other burner flames or uncontrolled air infiltration.
3. Air/fuel ratio must be set to, and remain at, the specified value, or range. In multi-zone, multi-burner firing chambers, a means for determining individual burner ratios must be provided.
4. Temperature of combustion air must not exceed that specified in the quotation.
5. Firing rate must be as specified.
6. Combustion chamber dimensions must be as specified.
7. Furnace pressure must not allow for air infiltration (in order to maintain overall furnace atmosphere).
8. Fuel analysis must be as specified. If a range of fuel compositions is provided, the tested composition must lie entirely within that range. No components are permissible in quantities above the maximum value, nor below the minimum value, specified.
9. Flue gas recirculation, where applicable, must be provided at the levels specified in the quotation and free of any particulate or known contaminants.
10. No emissions level guarantee is made as to NO_x generated by chemically-fuel-bound-nitrogen unless specifically quantified in the quotation.
11. FivesNA's services must be contracted for emissions tuning of the system for guarantee to be valid.
12. Compliance testing of the system must be conducted within 60 days of initial start-up. Start-up must occur no later than 120 days from the date of shipment.

Testing is to be accomplished by an independent authorized agency, agreed to by FivesNA, utilizing EPA-Method 7E. A copy of the full report is to be furnished to FivesNA. All costs of compliance testing, including recommended retests for reasons not attributable to FivesNA's system, shall be paid by Customer.
13. If any guaranteed emissions level is exceeded on start-up or at any point preceding successful compliance testing, FivesNA will, at its costs, make any and all adjustments and/or modifications to the burner that it deems appropriate and proper to reducing the emissions level to that guaranteed.
14. All guarantees contained in these conditions and limits shall end following completion of compliance testing and any retesting wherein all emission test points are documented to be at or below the guaranteed levels.

July 3, 2018

PCL Industrial Services, Inc
1500 South Union Ave.
Bakersfield, CA 93307

ATTENTION: Mr. Mark Pittser
Manager, Business Development

SUBJECT: Indicative emission guarantees for 85 MM Btu/h Ultra Low NOx GLE Combustion Systems

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Thank you for providing this opportunity to demonstrate the emission performance of our ultra-low NOx GLE technology when applied to a PCL steam generator. Please feel free to contact me if there are any questions concerning this letter or if we can be of any further assistance with your current combustion equipment needs.

Sincerely,
FIVES NORTH AMERICAN COMBUSTION INC.

Ron Henry
Combustion System Sales Specialist



Indicative Performance Guarantee – 85 MMBtu/h 4231-GLE

Based on the information that PCL Industrial Services, Inc. and Aera Energy have provided for an 85 MMBtu/h horizontal steam generator, FivesNA can offer the following **Indicative Emission Levels**:

NOx

The combustion system generated NOx will be guaranteed not to exceed:

- 7 ppm (corrected to a 3% O₂ dry volume basis) over a range from 85 MMBtu/h to 42 MMBtu/h (HHV) with the fuel specified below.

CO

The combustion system generated CO will be guaranteed not to exceed:

- 25 ppm (corrected to a 3% O₂ dry volume basis) over a range from 85 MMBtu/h to 42 MMBtu/h (HHV) with the fuel specified below.

ROC

The combustion system generated ROC (non-methane Reactive Organic Compounds) will be guaranteed not to exceed:

- 4 ppm (corrected to 3% O₂) over a range from 85 MMBtu/h to 42 MMBtu/h (HHV) with the fuel specified below.

The following conditions will apply to the above indicative guarantee:

1. The target fuel/air ratio for each burner is 15-30% excess air which is to be mixed with 15% Flue Gas Recirculation (FGR). Final settings of excess air and FGR will be determined by FivesNA upon commissioning and will be set to achieve emissions performance guarantees.
2. The fuel will be a blend of Purchased Natural Gas and Area Produced Fuel Gas (compositions listed below). The Area Produced Fuel Gas flow will be up to 375 Mscfd (15,625 scfh). The balance of the fuel gas will be Purchased Natural Gas:

Purchased Natural Gas (So. Cal. Natural Gas)

Component	Form.	% vol
Methane	CH ₄	89.60
Ethane	C ₂ H ₆	4.57
Propane	C ₃ H ₈	1.98
i-Butane	C ₄ H ₁₀	0.14
n-Butane	C ₄ H ₁₀	0.21
i-Petane	C ₅ H ₁₂	0.08
n-Petane	C ₅ H ₁₂	0.04
Hexane Plus	C ₆ +	0.02
Nitrogen	N ₂	0.31
Carbon Dioxide	CO ₂	3.05
Total		100
HHV	Btu/scf	1055
LHV	Btu/scf	953
SG		0.634
Wobbe Index		1325



Aera Produced Fuel Gas

		Lean	Design	Rich
Hydrogen Sulfide Pre-treatment*	% vol, H2S	1	6.0	10
Carbon Dioxide	% vol, CO2	40	19.65	10
Methane	% vol, CH4	45	54.89	65
Specific Gravity		1.059	1.051	0.974
HHV (dry)	Btu/scf	743	1173	1277
LHV (dry)	Btu/scf	674	1070	1164
C3+ Hydrocarbon**	Gal/Mcf	2.34	5.18	5.18
Wobbe Index		722	1144	1294

(*) For all Aera Produced Fuel Gases, H2S to be removed prior to combustion by SulfaTreat Tower(s) or similar sulfur removal process. H2S concentration expected to be < 10 ppmv. Total Sulfur content in the treated fuel gas to be less than 100 ppm. Fuel compositions and properties will shift proportionally with the H2S removal.

(**) Aera Produced Fuel Gas alone and blended with Purchased Natural Gas will be kept at sufficient temperature to avoid the hydrocarbon dew point at all points in the fuel train and burner.

3. An online gas chromatograph will be used to determine the composition of the Aera Produced Fuel Gas on a continual basis for use by the combustion ratio control system.
4. The process temperature will not exceed 1600 °F.
5. A reaction chamber will be mounted in a horizontal steam generator with a radiant section tube ID of at least 10⁻⁴" and a length of 42'.
6. Combustion air temperature will be 30°F to 115°F. The FGR temperature is estimated to be 240 °F and limited to no greater than 250 °F.
7. Combustion system control will include the latest version of the proprietary patented algorithms (8379-CMS-EMB-SW4 or higher) and a fully functional "mass flow control" fuel and air ratio system.
8. The emissions data will be obtained from a sample port at a point within the steam generator exhaust gas stack.
9. The test data will be extracted from a single point and time averaged.
10. FivesNA will verify all emission levels noted above following start-up when the operating mode of the burner and combustion system is at steady state and absent of any pressure spikes in either the field supply or duct systems. Our standard service rates outlined in our Sheet M9P-S will apply. If no further testing is conducted as outlined in the attached **CONDITION AND LIMITS OF FIVES NORTH AMERICAN COMBUSTION, INC. ("FIVESNA") EMISSIONS LEVELS GUARANTEE (GRM12)**, this test will be sufficient to satisfy the guarantee.
11. A chemiluminescent NOx analyzer or other device suitable for measuring ultra-low NOx emission levels, supplied by others, must be made available to FivesNA at time of start-up.

No formal process or emissions guarantees are offered at this time. Warranties are only offered as part of an actionable, firm price proposal. All warranty issues will be addressed per FivesNA's Conditions and Limits and/or Standard Terms and Conditions which are attached.



Indicative Performance Estimate – 85 MMBtu/h 4231-GLE

With respect to the expected emissions levels for Particulate Matter emissions, we offer the following:

PM-10

The 4231-GLE burner is not an appreciable source of particulate matter (PM-10) during normal gas-fired operation. Particulate can be introduced into the system in several ways such as poor inlet air filtering, particulate or condensable-laden fuel gas, and in some cases by the process itself. FivesNA cannot guarantee total stack particulate levels due to these and other factors that are outside of our control or influence. We can, however, estimate that the combustion system, firing with clean air and the indicated produced gaseous fuel, operating at the design ratio condition of 15% to 30% excess air, will produce less than 0.005 lb/MMBtu of particulate when the fuel temperatures is maintained at least 25°F above the hydrocarbon dew point. This estimate is based on performance testing of similar systems in the San Joaquin Valley as well as literature, publications, and academic sources where particulate has been measured from gas combustion systems.



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OF
FIVES NORTH AMERICAN COMBUSTION, INC. ("FivesNA")
EMISSIONS LEVELS GUARANTEE**

September 2010

**Any change in data or the process variables specific to this application,
or failure to comply with any of the conditions and limits specified below,
voids this guarantee.**

**The term "as specified," as used throughout this document, refers to the specification
contained in the original quotation, and any subsequent changes for the same
application as are made or agreed to in writing by FivesNA.**

1. Firing chamber temperature must be as specified. This temperature is defined as that indicated by a thermocouple inserted into the firing chamber to a distance sufficient to eliminate refractory gradient error.
2. Flame envelope must neither be obstructed by other surfaces in the firing chamber nor intersected by other burner flames or uncontrolled air infiltration.
3. Air/fuel ratio must be set to, and remain at, the specified value, or range. In multi-zone, multi-burner firing chambers, a means for determining individual burner ratios must be provided.
4. Temperature of combustion air must not exceed that specified in the quotation.
5. Firing rate must be as specified.
6. Combustion chamber dimensions must be as specified.
7. Furnace pressure must not allow for air infiltration (in order to maintain overall furnace atmosphere).
8. Fuel analysis must be as specified. If a range of fuel compositions is provided, the tested composition must lie entirely within that range. No components are permissible in quantities above the maximum value, nor below the minimum value, specified.
9. Flue gas recirculation, where applicable, must be provided at the levels specified in the quotation and free of any particulate or known contaminants.
10. No emissions level guarantee is made as to NO_x generated by chemically-fuel-bound-nitrogen unless specifically quantified in the quotation.
11. FivesNA's services must be contracted for emissions tuning of the system for guarantee to be valid.
12. Compliance testing of the system must be conducted within 60 days of initial start-up. Start-up must occur no later than 120 days from the date of shipment.

Testing is to be accomplished by an independent authorized agency, agreed to by FivesNA, utilizing EPA-Method 7E. A copy of the full report is to be furnished to FivesNA. All costs of compliance testing, including recommended retests for reasons not attributable to FivesNA's system, shall be paid by Customer.
13. If any guaranteed emissions level is exceeded on start-up or at any point preceding successful compliance testing, FivesNA will, at its costs, make any and all adjustments and/or modifications to the burner that it deems appropriate and proper to reducing the emissions level to that guaranteed.
14. All guarantees contained in these conditions and limits shall end following completion of compliance testing and any retesting wherein all emission test points are documented to be at or below the guaranteed levels.

July 3, 2018

PCL Industrial Services, Inc
1500 South Union Ave.
Bakersfield, CA 93307

ATTENTION: Mr. Mark Pittser
Manager, Business Development

SUBJECT: Indicative emission guarantees for 62.5 MM Btu/h Ultra Low NOx GLE Combustion Systems

Dear Mr. Pittser,

We have revised the previously issued "Indicative Emissions Guarantee" to reflect the new requirements. The performance statements below are based on the information that you have provided in the e-mail dated March 24, 2014 and subsequent conversations with you and a team at Aera Energy on July 2, 2018. Based on this information, we can offer you an indicative emissions performance guarantee, detailed below.

Emissions guarantees have both a technical and commercial significance. On the technical front, Fives North American Combustion performs a rigorous analysis of emissions performance with every warranty we issue. General arrangement drawings, fuel analyses and intended modes of operation are all considered by this process. Likewise, a warranty represents a significant commercial obligation. Such an obligation is evaluated with other contractual terms, such as price, delivery, scope of supply and overall risk profile of the proposed contract. At this time we are able to offer PCL indicative guarantees which represent what we could agree to as a portion of a sales contract, provided all the conditions enumerated are appropriate. Indicative guarantees are not a warrantable equipment performance item associated with any specific contract or equipment order but could be "converted" later upon a formal job review process.

Thank you for providing this opportunity to demonstrate the emission performance of our ultra-low NOx GLE technology when applied to a PCL steam generator. Please feel free to contact me if there are any questions concerning this letter or if we can be of any further assistance with your current combustion equipment needs.

Sincerely,
FIVES NORTH AMERICAN COMBUSTION INC.

Ron Henry
Combustion System Sales Specialist



Indicative Performance Guarantee – 62.5 MMBtu/h 4231-GLE

Based on the information that PCL Industrial Services, Inc. and Aera Energy have provided for a 62.5 MMBtu/h horizontal steam generator, FivesNA can offer the following **Indicative Emission Levels**:

NOx

The combustion system generated NOx will be guaranteed not to exceed:

- 7 ppm (corrected to a 3% O₂ dry volume basis) over a range from 62.5 MMBtu/h to 31 MMBtu/h (HHV) with the fuel specified below.

CO

The combustion system generated CO will be guaranteed not to exceed:

- 25 ppm (corrected to a 3% O₂ dry volume basis) over a range from 62.5 MMBtu/h to 31 MMBtu/h (HHV) with the fuel specified below.

ROC

The combustion system generated ROC (non-methane Reactive Organic Compounds) will be guaranteed not to exceed:

- 4 ppm (corrected to 3% O₂) over a range from 62.5 MMBtu/h to 31 MMBtu/h (HHV) with the fuel specified below.

The following conditions will apply to the above indicative guarantee:

1. The target fuel/air ratio for each burner is 15-30% excess air which is to be mixed with 15% Flue Gas Recirculation (FGR). Final settings of excess air and FGR will be determined by FivesNA upon commissioning and will be set to achieve emissions performance guarantees.
2. The fuel will be a blend of Purchased Natural Gas and Area Produced Fuel Gas (compositions listed below). The Area Produced Fuel Gas flow will be up to 900 Mscfd (37,500 scfh). The balance of the fuel gas will be Purchased Natural Gas:

Purchased Natural Gas (So. Cal. Natural Gas)

Component	Form.	% vol
Methane	CH ₄	89.60
Ethane	C ₂ H ₆	4.57
Propane	C ₃ H ₈	1.98
i-Butane	C ₄ H ₁₀	0.14
n-Butane	C ₄ H ₁₀	0.21
i-Petane	C ₅ H ₁₂	0.08
n-Petane	C ₅ H ₁₂	0.04
Hexane Plus	C ₆ +	0.02
Nitrogen	N ₂	0.31
Carbon Dioxide	CO ₂	3.05
Total		100
HHV	Btu/scf	1055
LHV	Btu/scf	953
SG		0.634
Wobbe Index		1325



Aera Produced Fuel Gas

		Lean	Design	Rich
Hydrogen Sulfide Pre-treatment*	% vol, H2S	1	6.0	10
Carbon Dioxide	% vol, CO2	40	19.65	10
Methane	% vol, CH4	45	54.89	65
Specific Gravity		1.059	1.051	0.974
HHV (dry)	Btu/scf	743	1173	1277
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C3+ Hydrocarbon**	Gal/Mcf	2.34	5.18	5.18
Wobbe Index		722	1144	1294

(*) For all Aera Produced Fuel Gases, H2S to be removed prior to combustion by SulfaTreat Tower(s) or similar sulfur removal process. H2S concentration expected to be < 10 ppmv. Total Sulfur content in the treated fuel gas to be less than 100 ppm. Fuel compositions and properties will shift proportionally with the H2S removal.

(**) Aera Produced Fuel Gas alone and blended with Purchased Natural Gas will be kept at sufficient temperature to avoid the hydrocarbon dew point at all points in the fuel train and burner.

- An online gas chromatograph will be used to determine the composition of the Aera Produced Fuel Gas on a continual basis for use by the combustion ratio control system.
- The process temperature will not exceed 1600 °F.
- A reaction chamber will be mounted in a horizontal steam generator with a radiant section tube ID of at least 9'-3" and a length of at least 35'.
- Combustion air temperature will be 30°F to 115°F. The FGR temperature is estimated to be 240 °F and limited to no greater than 250 °F.
- Combustion system control will include the latest version of the proprietary patented algorithms (8379-CMS-EMB-SW4 or higher) and a fully functional "mass flow control" fuel and air ratio system.
- The emissions data will be obtained from a sample port at a point within the steam generator exhaust gas stack.
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- A chemiluminescent NOx analyzer or other device suitable for measuring ultra-low NOx emission levels, supplied by others, must be made available to FivesNA at time of start-up.

No formal process or emissions guarantees are offered at this time. Warranties are only offered as part of an actionable, firm price proposal. All warranty issues will be addressed per FivesNA's Conditions and Limits and/or Standard Terms and Conditions which are attached.



Indicative Performance Estimate – 62.5 MMBtu/h 4231-GLE

With respect to the expected emissions levels for Particulate Matter emissions, we offer the following:

PM-10

The 4231-GLE burner is not an appreciable source of particulate matter (PM-10) during normal gas-fired operation. Particulate can be introduced into the system in several ways such as poor inlet air filtering, particulate or condensable-laden fuel gas, and in some cases by the process itself. FivesNA cannot guarantee total stack particulate levels due to these and other factors that are outside of our control or influence. We can, however, estimate that the combustion system, firing with clean air and the indicated produced gaseous fuel, operating at the design ratio condition of 15% to 30% excess air, will produce less than 0.005 lb/MMBtu of particulate when the fuel temperatures is maintained at least 25°F above the hydrocarbon dew point. This estimate is based on performance testing of similar systems in the San Joaquin Valley as well as literature, publications, and academic sources where particulate has been measured from gas combustion systems.



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4. Temperature of combustion air must not exceed that specified in the quotation.
5. Firing rate must be as specified.
6. Combustion chamber dimensions must be as specified.
7. Furnace pressure must not allow for air infiltration (in order to maintain overall furnace atmosphere).
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14. All guarantees contained in these conditions and limits shall end following completion of compliance testing and any retesting wherein all emission test points are documented to be at or below the guaranteed levels.

Flare Specification



16310 BRATTON LANE | BUILDING 3 #350 | AUSTIN, TX 78728

COMMERCIAL PROPOSAL

PROJECT NAME	EMERGENCY ENCLOSED FLARE
CUSTOMER NAME	AERA ENERGY LLC
CUSTOMER LOCATION	BAKERSFIELD, CA
END USER NAME	AERA ENERGY LLC
JOB SITE LOCATION	CALIFORNIA
PREPARED FOR	ERIC PAULSON T +1 661.665.5000 EWPAULSON@AREAENERGY.COM
SALES CONTACT	TIM EGAN BUSINESS DEVELOPMENT MANAGER CEB® OFFICE +1 512.836.9473 MOBILE +1 404.386.2535 AEREON.COM TEGAN@AEREON.COM
TECHNICAL CONTACT	MIRAGE THAKAR MANAGER OF APPLICATIONS ENGINEERING MTHAKAR@AEREON.COM
QUOTE NUMBER	13-1002 REV 2
DATE	NOVEMBER 11, 2015

TABLE OF CONTENTS

SECTION	PAGE
1.0 DESIGN CONDITIONS	3
2.0 SCOPE OF SUPPLY	4
2.1 ENCLOSED FLARE SCOPE OF SUPPLY	4
3.0 COMMERCIAL SUMMARY	5
3.1 COMMERCIAL SCOPE OF SUPPLY	5
3.2 VALIDITY	5
3.3 DELIVERY	6
3.4 SHIPPING TERMS	6
3.5 PACKING AND SHIPPING PREPARATION	6
3.6 TERMS OF PAYMENT	6
3.7 TECHNICAL ASSISTANCE FEES	7
3.8 DOCUMENTATION	7
3.9 QUALITY / NON-DESTRUCTIVE TESTING	8
3.10 CLARIFICATIONS	8
4.0 EXCLUSION LIST	8
4.1 FLARE TECHNICAL EXCLUSIONS	8
4.2 FLARE COMMERCIAL EXCLUSIONS	9

1.0 DESIGN CONDITIONS

GAS COMPOSITION			THERMAL OUTPUT	
HYDROGEN	H2		MAXIMUM OUTPUT	40 MMBTU/HR.
OXYGEN	O2	0.65	MINIMUM OUTPUT	4 MMBTU/HR.
NITROGEN	N2	5.73		
AIR	N2 + O2			
CARBON DIOXIDE	CO2		EXPECTED EMISSIONS	
AMMONIA	NH3		VOLATILE ORGANIC COMPOUND	0.1 LB/MMBTU
WATER	H2O		CARBON MONOXIDE	0.31 LB/MMBTU
CARBON MONOXIDE	CO	20.56	NITROGEN OXIDES	0.068 LB/MMBTU
METHANE	CH4	69.02	SOOT	MINIMAL
ETHANE	C2H6			
ETHYLENE	C2H4			
ACETYLENE	C2H2		ELECTRICAL CLASSIFICATION	
PROPANE	C3H8	3.00	BASE OF THE FLARE	NOT CLASSIFIED
PROPYLENE	C3H6		CONTROL PANEL LOCATION	NOT CLASSIFIED
I BUTANE	C4H10	3.00	ENCLOSED FLARE UTILITIES REQUIRED	
N BUTANE	C4H10		ELECTRICITY	1 PH/ 60 HZ/ 120 V
BUTENE	C4H8		PILOT GAS	65 SCFH @ 8 PSIG
I PENTANE	C5H12		PURGE GAS	13 SCFH @ 15-150 PSIG
N PENTANE	C5H12			
PENTENE	C5H10			
CYCLOPENTANE	C5H10		TYPE OF FLARE	
METHYLCYCLOPENTANE	C6H12		<input type="checkbox"/> ELEVATED	<input type="checkbox"/> OFFSHORE
HEXANES	C6H14		<input type="checkbox"/> BIO-GAS	<input type="checkbox"/> MULTI-POINT
CYCLOHEXANE	C6H12		<input checked="" type="checkbox"/> ENCLOSED FLARE	<input type="checkbox"/> PIT FLARE
METHYLCYCLOHEXANE	C7H14		<input type="checkbox"/> RENTAL	<input type="checkbox"/> PORTABLE
HEPTANE	C7H16		ENCLOSED SUPPORT OF STRUCTURE	
CYCLOHEPTANE	C7H14		<input type="checkbox"/> SELF-SUPPORTED	<input type="checkbox"/> DERRICK SUPPORTED
HYDROGEN SULFIDE	H2S		<input type="checkbox"/> GUYED	<input checked="" type="checkbox"/> NONE
1,2 BUTADIENE	C4H6		ENCLOSED FLAME MONITORING SYSTEM	
1,3 BUTADIENE	C4H6		<input type="checkbox"/> THERMOCOUPLE	<input type="checkbox"/> INFRA RED MONITOR
BENZENE	C6H6		<input type="checkbox"/> IONIZATION ROD	<input checked="" type="checkbox"/> ULTRAVIOLET SCANNER
TOLUENE	C7H8			
ETHYLBENZENE	C8H10			
STYRENE	C8H8			
XYLENE	C8H10			
OCTANE	C8H18			
N-NONANE	C9H20			
N-DECANE	C10H22			
METHANOL	CH4O			
MAXIMUM FLOW RATE	MMSCFD	1.34		
GAS TEMPERATURE	° F	80		
SUPPLY PRESSURE	PSIG	30		
MOLECULAR WEIGHT	G/MOL	17.25		
LOWER HEATING VALUE	BTU/SCF	715		

PLEASE TAKE YOUR TIME TO CAREFULLY REVIEW THE DESIGN CONDITIONS STATED ABOVE AND NOTIFY FLARE INDUSTRIES IMMEDIATELY IF ANY CONDITION DOES NOT MATCH YOUR LATEST REQUIREMENTS. THIS WILL HELP US TO REDUCE TURNAROUND TIME WHILE PROVIDING YOU A BETTER SERVICE, THANK YOU.

2.0 SCOPE OF SUPPLY

2.1 ENCLOSED FLARE SCOPE OF SUPPLY

ITEM	QTY.	ENCLOSED FLARE DESCRIPTION
1	1	AIR-ASSISTED FLARE TIP MODEL: MAVP-0416 DIAMETER: 4 INCH NOMINAL INCLUDES 16" AIR SHROUD FOR AIR DELIVERY LENGTH: 4 FT WELDED CONNECTION FOR GAS RISER 16" x 150# RFSO CONNECTION FOR AIR RISER FLAME RETENTION DEVICE: RETENTION TABS TIP MATERIALS: TOP 4 FOOT - 316 STAINLESS STEEL
2	1	ENCLOSED COMBUSTION CHAMBER ENCLOSURE DIAMETER: 84 INCH OVERALL HEIGHT: 40 FT FLAME DETENTION DEVICE: UV FLAME DETECTOR INLET MATING FLANGE: 4 INCH X 150# RFSO CS LIFTING LUGS: TWO (2) OVER FIRE PROTECTION: ONE (1) TYPE K THERMOCOUPLE WITH THERMOCOUPLE PORT & THERMO-WELL ONE (1) 2INCH SIGHT GLASS PORTS TO VIEW BURNER & PILOT MATERIAL: CARBON STEEL THERMAL INSULATION: 3 INCH UP TO 8 FT ABOVE GRADE 2 INCH FOR REMAINING HEIGHT
3	1	PILOT MODEL: LUMINEX IGNITION METHOD: ELECTRONIC SPARK FLAME DETECTION DEVICE: UV SCANNER SUPPORT: FIXED MATERIALS: 310 SS HEAD/ 316 SS BODY
4	1	CONTROL PANEL ENCLOSURE RATING: NEMA 4X – SS WEATHER PROOF CONTROLS THERMOCOUPLE INDICATOR AND OVER FIRE ALARM PILOT MONITORING AND PILOT FAILURE ALARM & SHUTDOWN AUTOMATIC IGNITION & RE-IGNITION OF PILOT FLAME SAFEGUARD PILOT STATUS INDICATION FORM C DRY CONTACTS FOR CUSTOMER ALARMS

- 5 1 AIR BLOWER FOR AIR-ASSISTED FLARE TIP:
7.5 HP BLOWER PROVIDES AIR FOR SMOKELESSNESS AND COMPLETE COMBUSTION
BLOWER RATED FOR 4,500 CFM AT 6" W.C. STATIC PRESSURE
VARIABLE FREQUENCY DRIVE (SHIPPED LOOSE)
VFD CONTROLS BY OTHERS
- 6 1 LOUVERED COMBUSTION AIR CONTROL SYSTEM
FULLY ADJUSTABLE AIR DAMPERS – FAIL OPEN
THREE (3) LOUVERS LOCATED AT EQUAL SPACING
MANUAL CONTROL ONLY – AUTOMATIC CONTROL NOT REQUIRED
- 7 1 4 IN INLET SHUTOFF VALVE (TO BE SHIPPED LOOSE AND INSTALLED BY OTHERS)
WAFFER STYLE BUTTERFLY VALVE WITH PNEUMATIC ACTUATOR AND ONE (1) PRESSURE REGULATOR
MATERIAL: CS/BODY AND 316 INTERNALS
- 8 1 4 IN FLAME ARRESTOR (TO BE SHIPPED LOOSE AND INSTALLED BY OTHERS)
ALUMINUM BODY/ ALUMINUM INTERNALS
- 9 3 FLARE INDUSTRIES OPERATION MANUALS:
ADDITIONAL MANUALS - \$300 MINIMUM EACH
- OPTIONS**
- 10 1 PILOT GAS VALVE TRAIN:
ALUMINUM BODY REGULATOR
BALL VALVE AND STRAINER
PRESSURE GAUGE
- 11 1 LADDERS AND PLATFORM PACKAGE
ONE (1) 90° GALVANIZED WORKING PLATFORM
PROVIDES ACCESS TO SAMPLE PORTS
GALVANIZED CAGED LADDER ASSEMBLY
ONE (1) GALVANIZED STEP-OFF PLATFORM

3.0 **COMMERCIAL SUMMARY**

3.1 **COMMERCIAL SCOPE OF SUPPLY**

DESCRIPTION	ITEM NO.	QTY.	PRICE (USD)
ENCLOSED FLARE	1-9	1	\$209,250.00

OPTION FOR ENCLOSED FLARE	ITEM NO.	QTY.	PRICE (USD)
PILOT GAS VALVE TRAIN	10	1	\$1,570.00
LADDERS AND PLATFORM PACKAGE FOR ENCLOSED FLARE	11	1	\$21,725.00

3.2 **VALIDITY**

THE PRICES IN THIS QUOTATION ARE FIRM AND FIXED FOR 30 DAYS.

3.3 DELIVERY

APPROVAL DRAWINGS:	
A. <u>P&ID(S)</u>	2-3 WEEKS AFTER ACCEPTANCE OF ORDER
B. <u>GA & ELECTRICAL</u>	5-6 WEEKS AFTER APPROVAL OF P&IDS
CLIENT REVIEW:	2 WEEKS *
FABRICATION:	16-18 WEEKS AFTER RECEIVING THE APPROVED DRAWINGS
TOTAL DELIVERY TIME:	25-29 WEEKS ARO

THE QUOTED DELIVERY IS BASED UPON OUR CURRENT PRODUCTION SCHEDULE / SHOP LOAD. AN UPDATED DELIVERY SCHEDULE WILL BE AVAILABLE AT TIME OF ORDER.

* IF FLARE INDUSTRIES DOES NOT RECEIVE APPROVAL FOR CONSTRUCTION WITHIN 2 WEEKS OF INITIAL APPROVAL DRAWING SUBMITTAL, THE PRODUCTION SCHEDULE WILL BE SUBJECT TO CHANGE BASED UPON SHOP LOAD.

3.4 SHIPPING TERMS

- EX-WORKS: AUSTIN, TX
- EX-WORKS: POINT OF MANUFACTURE

3.5 PACKING AND SHIPPING PREPARATION

- INLAND FREIGHT PACKING
- EXPORT PACKING *
- STORAGE AND PRESERVATION CRATING - 90 DAYS MAXIMUM STORAGE

* EXPORT PACKING AND CRATING ONLY INCLUDES TECHNOLOGY ITEMS AND EXCLUDES STACKS, LADDERS AND PLATFORMS, VESSELS, SKIDS, AND UTILITY PIPING.

3.6 TERMS OF PAYMENT

PROGRESS PAYMENTS AS PER THE FOLLOWING*:

50%	UPON RECEIPT OF ORDER, NET 30
40%	UPON PROCUREMENT OF MAJOR MATERIALS AND PRIOR TO SHIPMENT, NET 30
10%	BEFORE SHIPMENT (EX-WORKS)

*PAYMENT TERMS ARE ONLY VALID AS LONG AS CLIENT IS APPROVED FOR CREDIT BY FI'S FINANCIAL INSTITUTION. THREE CREDIT REFERENCES AND FINANCIAL STATEMENTS MAY BE REQUESTED FOR THIS PURPOSE.

3.7 TECHNICAL ASSISTANCE FEES

	DOMESTIC (US ONLY)
DAILY LABOR RATE	\$1,400.00
TRAVEL RATE	\$1,400.00
OVERTIME RATE	\$200.00/HOUR
TRAVEL EXPENSES	COST + 20%
STANDARD WORK DAY	8-HOUR DAY

*DAILY RATE INCLUDES ACCOMMODATIONS, GENERAL EXPENSES, SUBSISTENCE, TOLLS, & LOCAL TRANSPORTATION

**PLEASE SEE STANDARD TERMS AND CONDITIONS OF SALE

3.8 DOCUMENTATION

FLARE INDUSTRIES WILL PROVIDE THE FOLLOWING DOCUMENTATION ALONG WITH THE EQUIPMENT ON THIS PROJECT:

- PIPING AND INSTRUMENTATION DIAGRAM (P&ID)
- MECHANICAL GENERAL ARRANGEMENT
- OPERATING AND MAINTENANCE MANUALS (UPON SHIPMENT)
- LADDER LOGIC DIAGRAMS
- CONTROL ENCLOSURES DRAWINGS
- MANUFACTURING RECORD BOOKS (MRB)

3.9 QUALITY / NON-DESTRUCTIVE TESTING

- VISUAL INSPECTION
- DIMENSIONAL CHECK
- FACTORY ACCEPTANCE TEST: IGNITION SYSTEM ONLY
- DRY FILM THICKNESS: PAINTED CARBON STEEL COMPONENTS ONLY
- RADIOGRAPHY EXTENT:
- DYE PENETRANT EXAMINATION EXTENT:
- ULTRASONIC TESTING EXTENT:
- MAGNETIC PARTICLE EXAMINATION EXTENT:
- HYDRO-TESTING EXTENT:
- PNEUMATIC TESTING EXTENT: VALVE TRAINS ONLY, WHERE APPLICABLE
- HARDNESS/IMPACT TESTING:
- PMI:

3.10 CLARIFICATIONS

1. NO SPECS HAVE BEEN GIVEN A THIS TIME, CLIENT TO VERIFY AND CONFIRM DESIGN PARAMETERS.
2. AN ESTIMATED GAS LOWER HEATING VALUE (LHV) OF APPROXIMATELY 715BTU/SCF WAS CALCULATED, CLIENT TO VERIFY AND CONFIRM.

4.0 EXCLUSION LIST

THIS PROPOSAL IS OFFERED IN ACCORDANCE WITH THE BELOW EXCLUSIONS.

4.1 FLARE TECHNICAL EXCLUSIONS

1. CIVIL AND FOUNDATION DESIGN FOR ANY EQUIPMENT INCLUDING DEAD MEN, ANCHOR BOLTS OR NUTS, DESIGN OF ANCHOR BOLT LENGTH OR PROJECTION AS THIS IS PART OF CIVIL ENGINEERING FOUNDATION DESIGN.
2. THIS DESIGN IS EXCLUSIVE OF ALL EXTERNAL LOADINGS DUE TO UPSTREAM PIPING. WIND, SEISMIC AND TEMPERATURE LOADINGS HAVE BEEN CONSIDERED. ALLOWABLE NOZZLE LOADS OTHER THAN THOSE PUBLISHED BY API-537 ARE NOT CONSIDERED.
3. BOLT KITS AT BATTERY LIMIT FLANGED CONNECTIONS.
4. SUPPLY TO CUSTOMER OF SHOP DETAILS, FABRICATION DRAWINGS OR PROPRIETARY CALCULATIONS
5. INSTALLATION OF EQUIPMENT INCLUDING SUPPLY OF CRANES AND/OR PERSONNEL. GENERAL INSTALLATION INSTRUCTIONS AND ASSEMBLY DRAWINGS WILL BE PROVIDED, HOWEVER, DETAILED ERECTION INSTRUCTIONS AND DRAWINGS ARE EXCLUDED. THESE INSTRUCTIONS ARE MEANT TO PROVIDE GUIDANCE AND GENERAL STEPS TO COMPLETE THE INSTALLATION. THESE PROCEDURES ARE NOT INTENDED TO BE A SUBSTITUTE FOR EXPERIENCED INSTALLATION PERSONNEL. FIELD ASSEMBLY AND ERECTION OF THE FLARE IS OUTSIDE THE SCOPE OF WORK TO BE PROVIDED BY FLARE INDUSTRIES AND IS THE SOLE RESPONSIBILITY OF OTHERS. IT IS UNDERSTOOD THAT THE FIELD CONTRACTOR RETAINED FOR THIS PURPOSE IS FAMILIAR WITH THE ASSEMBLY AND ERECTION OF TALL TOWERS.
6. NO INTERCONNECTING PIPING, WIRE, OR CONDUIT IS INCLUDED BETWEEN PROPOSED EQUIPMENT, UNLESS OTHERWISE INDICATED IN THE SCOPE OF WORK SECTION OF PROPOSAL.
7. THE IGNITION SYSTEM / CONTROL PANEL / PILOTS AND RELATED VALVE TRAINS ARE A FLARE INDUSTRIES' STANDARD PACKAGE. AS SUCH, THEY ARE DESIGNED AND/OR MANUFACTURED ACCORDING TO OUR STANDARDS AND PROCEDURES, USING OUR STANDARD COMPONENTS. ALL VALVE TRAIN COMPONENTS HAVE THE FOLLOWING CHARACTERISTICS: ½ TO ¾ INCH DIAMETER THREADED FITTINGS, CARBON STEEL CONSTRUCTION. NO OTHER MATERIALS, DIAMETERS, FLANGE RATINGS, PIPING SPECIFICATIONS, OR

ADDITIONAL MATERIALS OR INSTRUMENTATION ARE INCLUDED, NOR DO ANY CLIENT SUPPLIED SPECIFICATIONS APPLY, UNLESS SPECIFICALLY AGREED TO IN WRITING BY FLARE INDUSTRIES.

8. ALL CALCULATIONS, ENGINEERING, AND SIZING PROVIDED IN OUR PROPOSAL ARE PRELIMINARY AND MAY CHANGE DURING DETAILED ENGINEERING. OPTIMIZATION OF THE DESIGN DURING PROJECT PHASE ENGINEERING MAY OCCUR AND IS NOT SUBJECT TO A REDUCTION IN PRICE.
9. DISPERSION CALCULATIONS, NOZZLE LOAD CALCULATIONS, FINITE ELEMENT ANALYSIS OR OTHER STRESS ANALYSIS, APART FROM STRUCTURAL CALCULATIONS OF THE STACK.
10. STRUCTURAL CALCULATIONS WILL BE SUBMITTED FOR INFORMATION ONLY, NOT BEING SUBJECT TO THE APPROVAL PROCESS.
11. CORROSION ALLOWANCE FOR CARBON STEEL IS 1/16 INCH ON WETTED PARTS AND 0 FOR AIR RISERS AND/OR AIR ANNULUSES. NO OTHER CORROSION ALLOWANCE IS APPLICABLE TO OUR DESIGN OR SCOPE OF WORK.
12. STANDARD DEFLECTION CRITERION FOR GUYED STACKS IS L/100 AND FOR SELF SUPPORTED STACKS AND DERRICKS IS L/133. NO OTHER DEFLECTION CRITERIA ARE APPLICABLE.
13. NACE COMPLIANT CARBON STEEL IS NOT INCLUDED, UNLESS SPECIFICALLY MENTIONED UNDER THE SCOPE OF WORK SECTION OF THE PROPOSAL.
14. IF NACE COMPLIANT CARBON STEEL IS PROPOSED, MATERIALS WHICH EXCEED THE REQUIREMENTS OF NACE MR-01-75 ARE NOT CONSIDERED.
15. PASSIVATION OR PICKLING OF STAINLESS STEEL MATERIALS OR PROCEDURE, POST WELD HEAT TREATMENT, PROCEDURES, OR ASSOCIATED CHARTS.
16. LOW TEMPERATURE CARBON STEEL IS NOT INCLUDED, UNLESS SPECIFICALLY MENTIONED UNDER THE SCOPE OF WORK SECTION OF THE PROPOSAL.
17. ANY TESTING OR PROCEDURES NOT MARKED AS INCLUDED IN THE QUALITY / TESTING SECTION OF PROPOSAL.
18. FLARE INDUSTRIES' STANDARD WELD PROCEDURES APPLY TO OUR EQUIPMENT, UNLESS OTHERWISE STATED IN OUR PROPOSAL. ANY REQUEST TO ALTER OR MODIFY OUR CURRENT WELD PROCEDURES BASED UPON CLIENTS' INTERNAL SPECIFICATIONS IS CURRENTLY EXCLUDED FROM OUR SCOPE OF SUPPLY. IF NEW PROCEDURES ARE REQUESTED BY THE CLIENT, PRICE AND DELIVERY IMPACT WILL APPLY.
19. HYDRO-TESTING OR PROCEDURES OF ANY PIECE OF EQUIPMENT OTHER THAN STAMPED ASME PRESSURE VESSELS, UNLESS SPECIFICALLY INDICATED IN THE PROPOSAL.
20. FLARE STACKS ARE OPEN TO ATMOSPHERE; MAXIMUM DESIGN PRESSURE IS CONSIDERED TO BE 14.5 PSIG. DESIGN PRESSURES ABOVE 14.5 PSIG ARE EXCLUDED.
21. PAINTING OR COATING FOR STAINLESS STEEL, INTERNAL SURFACES OF EQUIPMENT OR GALVANIZED EQUIPMENT.
22. EXTERNAL INSULATION, INSULATION CLIPS OR HEAT TRACING OF ANY KIND. REFRACTORY OR INSULATION IS INCLUDED FOR ENCLOSED COMBUSTION DEVICES.
23. ARMORED CABLE OR CABLE TRAY OF ANY KIND. WE ARE SUPPLYING OUR STANDARD WIRE AND CONDUIT WITHIN OUR BATTERY LIMITS.
24. MATERIAL CERTIFICATION AS PER BSEN 10204, 3.2 (FORMERLY 3.1A AND 3.1C).

4.2 FLARE COMMERCIAL EXCLUSIONS

1. WHEREAS REGARDS STATEMENTS IN CLIENT SPECIFICATIONS OR PURCHASE ORDERS CONCERNING SPECIFICATION ORDER OF PRECEDENCE, PLEASE BE ADVISED THAT FLARE INDUSTRIES' PROPOSAL, INCLUDING ITS INTEGRAL EXCLUSION LIST, PRECEDES AND PRECLUDES ALL OTHER DOCUMENTS OR AGREEMENTS WHETHER WRITTEN OR VERBAL.
2. FREIGHT COSTS AND LOGISTICS WILL BE OFFERED TO OUR CLIENTS AS AN OPTIONAL PRICE OR AS PART OF THE BASE PRICE, BUT NOT AT COST AS THE PHRASE "PREPAY AND ADD" IS SOMETIMES INTERPRETED.
3. FLARE INDUSTRIES STRICTLY PROHIBITS THE USE OR SALE OF OUR EQUIPMENT IN COUNTRIES SANCTIONED BY THE UNITED STATES GOVERNMENT SUCH AS: IRAN, SYRIA, SUDAN, NORTH KOREA, AND CUBA.
4. THIRD PARTY INSPECTION
5. ALL DOCUMENTATION WILL BE SUPPLIED IN ACROBAT PDF FORMAT, NOT WORD, EXCEL, AUTOCAD, OR ANY OTHER FORMAT.

6. PLEASE NOTE THAT DOCUMENTATION AND DRAWING DELIVERY DATES ARE AS STATED IN OUR PROPOSAL, HOWEVER, IF A VDS APPLIES TO THE PROJECT, ALL DELIVERY DATES MUST BE AGREED TO IN WRITING ON A DOCUMENT BY DOCUMENT BASIS.
7. DOCUMENTATION LEGALIZATION COSTS.
8. OUR OPERATING AND MAINTENANCE MANUALS AND QUALITY DOSSIERS WILL BE PROVIDED IN THE ENGLISH LANGUAGE. TRANSLATION OF THE O&M MANUALS IS AVAILABLE AT AN ADDITIONAL COST, HOWEVER, ONLY TEXT GENERATED BY FI WILL BE TRANSLATED. DRAWINGS, CUT SHEETS, DATA SHEETS AND/OR STANDARD DOCUMENTS WILL BE PROVIDED IN ENGLISH.
9. NO FI PRESENCE AT MEETINGS (INCLUDING, BUT NOT LIMITED TO, KICK-OFF MEETINGS, HAZOP MEETINGS, DRAWING REVIEW AND INSPECTION / CERTIFICATION MEETINGS) IS INCLUDED, UNLESS EXPLICITLY MENTIONED IN THE PROPOSAL.
10. SPARE PARTS WHEN QUOTED DO NOT INCLUDE CROSS SECTIONAL DRAWINGS, EXPORT PACKING OR FREIGHT.
11. THERE ARE NO BANK GUARANTEES, PERFORMANCE BONDS, OR WARRANTY BONDS INCLUDED IN OUR SCOPE OF SUPPLY OR PRICE. COST FOR THESE REQUIREMENTS WILL BE ADDED ON TO OUR BASE PRICE QUOTED AS OPTIONS. ALL BOND AND/OR BANK GUARANTEE FORMATS, IF APPLICABLE, MUST BE AGREED TO IN WRITING BY FLARE INDUSTRIES.
12. STORAGE OF EQUIPMENT AFTER NOTIFICATION OF READINESS FOR SHIPMENT.



November 11, 2015

RE: Emergency Flare System for T.J. Cross/Vogelsang [FI Ref: 13-1009 AERA Energy]

To whom it may concern:

Flare Industries, an AEREON company, has proposed a **84"** outer diameter x 40 ft tall fully enclosed flare, model **FEF-84** for the above-mentioned project.

The proposed flare system is expected to achieve at least 98% destruction efficiency for volatile organic compounds, and the emissions from the flare system are expected to be less than the numbers stated below:

Component	Emission Factor (lb/10 ⁶ Btu)
Volatile Organic Compound	0.10
Carbon Monoxide	0.31
Nitrogen Oxides	0.068
Soot	Minimal

Please contact the undersigned in case of questions.

Best regards,

Mirage Thakar
Manager of Applications Engineering
Austin, Texas

Flow Meter Specification

Rosemount 3095 MultiVariable™ Transmitter with MODBUS® Protocol



CE

The Proven Leader in MultiVariable Measurement

- Industry leading performance with $\pm 0.05\%$ of DP reading accuracy
- Ten year stability under actual process conditions
- Unprecedented reliability backed by a limited 12-year warranty
- Four outputs from one device including Mass Flow and advanced data logging
- Easy integration with MODBUS protocol
- Coplanar™ platform enables DP Flowmeters

Rosemount 3095 Product Overview



Industry leading performance with $\pm 0.05\%$ of DP reading accuracy

Enabled by superior sensor technology and engineered for optimal flow performance, the 3095FB delivers unprecedented reference accuracy with up to 100:1 rangeability. Superior performance results in increased measurement accuracy.

Ten year stability of 0.25%

Through aggressive testing, the 3095FB has proven its ability to maintain unprecedented performance under the most demanding conditions. Superior transmitter stability decreases calibration frequency for reduced maintenance and operation costs.

Unprecedented reliability backed by a limited 12-year warranty

Further enhance installation practices with the most reliable platform supported by a 12-year warranty.

Four outputs from one device

The advanced MultiVariable device measures three process variables simultaneously with optional calculated mass flow and advanced data logging capabilities. One device installation means reduced process penetrations, reduced inventory, and reduced installations costs.

Easily integrated with MODBUS communications

Designed for easy integration with Supervisory Control and Data Acquisition units (SCADA), Distributed Control Systems (DCS), Flow Computers or Programmable Logic Controllers (PLC) and capable of multi-dropping up to 32 transmitters on one RS-485 bus. Easy integration reduces engineering and installation costs.

Coplanar platform enables DP flowmeters

The flexible coplanar platform allows integration with the complete offering of Rosemount primary elements for any flow application. The solution arrives factory calibrated, pressure-tested, and ready to install right out of the box. Only Rosemount has a scalable coplanar transmitter design to reduce engineering and inventory costs.

Contents

Ordering information	page 3	Product certifications	page 11
Specifications	page 7	Dimensional drawings	page 13

Ordering information

Table 1. Rosemount 3095F MultiVariable Transmitter Ordering Information

		— Not available		
		3095FB	3095FC	
Code	Product Description			
Standard		Standard	Standard	
3095F	MultiVariable Transmitter	★	★	
Code	Output			
Standard		Standard	Standard	
B	Process Variable Measurement: Modbus RS-485	★	—	
C	Process Variable Measurement: Mass Flow and Data Logging, Modbus RS-485	—	★	
Code	Differential Pressure Ranges			
Standard		Standard	Standard	
2	0–2.5 to 0–250 inH ₂ O (0–6,23 to 623 mbar)	★	★	
3	0–10 to 0–1000 inH ₂ O (0–25 mbar to 0–2,5 mbar)	★	★	
Code	Static Pressure Ranges			
Standard		Standard	Standard	
3	0.5–8 to 0.5–800 psia (0,03–0,552 to 0,03–55,2 bar)	★	★	
4	0.5–36.26 to 0.5–3626 psia (0,03–2,5 to 0,03–250 bar)	★	★	
C	0–8 to 0–800 psig (0–0,552 to 0–55,2 bar)	★	★	
D	0–36.26 to 0–3626 psig (0–2,5 to 0–250 bar)	★	★	
Isolator Material		Fill Fluid		
Standard			Standard	Standard
A	316L SST	Silicone	★	★
B ⁽¹⁾	Alloy C-276	Silicone	★	★
J ⁽²⁾	316L SST	Inert	★	★
K ⁽¹⁾⁽²⁾	Alloy C-276	Inert	★	★
Expanded				
F	Gold-Plated 316L SST	Silicone		
D ⁽³⁾	Tantalum	Silicone		—
L ⁽³⁾	Tantalum	Inert		—
Flange Style		Material		
Standard			Standard	Standard
A	Coplanar	CS	★	★
B	Coplanar	SST	★	★
C	Coplanar	Alloy C-276 ⁽¹⁾	★	★
J	DIN Compliant Traditional Flange, SST 10 mm Adapter/Manifold Bolting	SST, ⁷ / ₁₆ - 20 Bolting	★	★
0	None		★	★
Drain/Vent Material				
Standard			Standard	Standard
A	SST		★	★
C ⁽¹⁾	Alloy C-276		★	★
0	None		★	★

Table 1. Rosemount 3095F MultiVariable Transmitter Ordering Information

			— Not available	
			3095FB	3095FC
O-ring				
Standard			Standard	Standard
1	Glass-filled PTFE		★	★
Process Temperature Input				
Standard			Standard	Standard
0	Fixed Process temperature (No Cable)		★	★
1	RTD Input with 12 ft. (3,66 m) of Shielded Cable		★	—
2	RTD Input with 24 ft. (7,32 m) of Shielded Cable		★	—
7	RTD Input with 75 ft. (22,86 m) of Shielded Cable		★	—
3	RTD Input with 12 ft. (3,66 m) of Armored, Shielded Cable		★	—
4	RTD Input with 24 ft. (7,32 m) of Armored, Shielded Cable		★	—
8	RTD Input with 75 ft. (22,86 m) of Armored, Shielded Cable		★	—
A	RTD Input with 12 ft. (3,66 m) of ATEX/IECEx Flameproof Cable		★	—
B	RTD Input with 24 ft. (7,32 m) of ATEX/IECEx Flameproof Cable		★	—
C	RTD Input with 75 ft. (22,86 m) of ATEX/IECEx Flameproof Cable		★	—
Code	Transmitter Housing Material	Conduit		
Standard			Standard	Standard
A	Polyurethane-covered Aluminum	1/2–14 NPT	★	★
B	Polyurethane-covered Aluminum	M20 x 1.5 (CM20)	★	★
E	Polyurethane-covered Aluminum	3/4–14 NPT	—	★
J	SST	1/2–14 NPT	★	—
K	SST	M20 x 1.5 (CM20)	★	—
Code	Terminal Block			
Standard			Standard	Standard
A	Standard		★	—
B	With Integral Transient Protection		★	★
C	CE MARK/ Compliant with EMC - Transient Protection Included		★	—
Code	Display			
Standard			Standard	Standard
0	None		★	★
1	LCD Display		★	★
Code	Bracket			
Standard			Standard	Standard
0	None (required for option code S3 or S5)		★	★
1	Coplanar SST Flange Bracket for 2-in. Pipe or Panel Mount, SST Bolts		★	★
2	Traditional Flange Bracket for 2-in. Pipe Mounting, CS Bolts		★	★
3	Traditional Flange Bracket for Panel Mounting, CS Bolts		★	★
5	Traditional Flange Bracket for 2-in. Pipe Mounting, 300 Series, SST Bolts		★	★
6	Traditional Flange Bracket for Panel Mounting, 300 Series, SST Bolts		★	★
8	SST Traditional Flange Bracket for 2-in. Pipe Mounting, 300 Series, SST Bolts		★	★
9	SST Traditional Flange Flat Bracket for 2-in. Pipe Mounting, 300 Series, SST Bolts		★	★

Table 1. Rosemount 3095F MultiVariable Transmitter Ordering Information

		— Not available	
		3095FB	3095FC
Code	Bolts		
Standard		Standard	Standard
0	CS bolts	★	★
1	Austenitic 316 SST bolts	★	★
N	None	★	★
Code	Approvals		
Standard		Standard	Standard
0	None	★	★
A	FM Explosion-proof, Dust Ignition-proof	★	—
C	CSA Explosion-proof, Dust Ignition-proof, Division 2	★	—
M	CSA Explosion-proof (United States and Canada)	—	★
H	ATEX Flameproof	★	★
P	ATEX Dust	★	—
7	IECEX Flameproof	★	—
8	IECEX Dust	★	—
Code	Engineered Measurement Solution		
Standard		Standard	Standard
N	Direct Process Variable Measurement: <i>MODBUS</i> (Required for 3095FB)	★	—
C	Mass Flow with Process Variable Measurement & Data Logging: <i>MODBUS</i> (Required for 3095FC)	—	★

Options (Include with selected model number)

Configuration			
Standard		Standard	Standard
C1 ⁽⁴⁾	Custom Configuration (Requires Completed Configuration Data Sheet)	★	★
Process Adapter			
Standard		Standard	Standard
DF ⁽⁵⁾	1/2-14 NPT Process Adapter, Type Determined by Selected Flange Material: Plated CS, SST, Cast C-276	★	★
Material Traceability Certification			
Standard		Standard	Standard
Q8	Material Traceability Certification per EN 10204 3.1	★	★
Calibration Certificate			
Standard		Standard	Standard
Q4	Calibration Data Sheet	★	★
Pressure Testing			
Standard		Standard	Standard
P1	Hydrostatic Testing with Certificate	★	★
Cleaning			
Standard		Standard	Standard
P2	Cleaning for Special Services	★	★

Table 1. Rosemount 3095F MultiVariable Transmitter Ordering Information

		— Not available	
		3095FB	3095FC
Integral Manifold			
Standard		Standard	Standard
S3 ⁽⁶⁾	Assemble to Rosemount 405 Compact Orifice	★	—
S5 ⁽⁶⁾	Assemble to 305 Integral Manifold	★	★
Primary Element			
Standard		Standard	Standard
S4 ⁽⁶⁾⁽⁷⁾	Assemble to Rosemount 485 or Rosemount 1195	★	—
Communication Board			
Standard		Standard	Standard
A1	Additional RS-232 Communication Board	—	★
Power Options			
Standard		Standard	Standard
A2	12 Vdc System with Batteries	—	★
A3	Mast with Solar Panel Assembly and 12 Vdc Batteries	—	★
Performance Class			
Standard		Standard	Standard
U3 ⁽⁸⁾	Ultra for Flow: 0.05% DP Reading Accuracy, Up to 100:1 Rangedown, 10 Yr Stability, 12 Yr Warranty	★	—
Typical Model Number: 3095F B 2 3 A B A 1 1 A B 0 1 0 A N			

- (1) Materials of Construction comply with metallurgical requirements highlighted within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.
- (2) Only available with C or D Gage Sensor Modules.
- (3) Not available with Absolute / Gage Pressure Ranges C or D.
- (4) 3095FC only allows all English or all Metric units.
- (5) Not available with S4 option.
- (6) "Assemble-to" items are specified separately and require a completed model number.
- (7) With a primary element installed, the maximum operating pressure will be the lesser of either the transmitter or the primary element.
- (8) Ultra for Flow (Option U3) applicable for 3095FB DP ranges 2 and 3 with SST isolator material and silicone fill fluid only.

Specifications

Functional Specifications

Service

3095FB

- Gas, Liquid, or Steam
- DP, P, and T with MODBUS output

3095FC

- AGA 8 Natural Gas, AGA 3 Orifice Plates
- Consult factory for other fluid and primary element combinations
- DP, P, T, mass flow, and API compliant data log with MODBUS output

Differential Sensor

Limits

- Range 2: -250 to 250 inH₂O (-623 to 623 bar)
- Range 3: -1000 to 1000 inH₂O (-2,49 to 2,49 bar)

Absolute Sensor

Limits

- Range 3: 0.5 to 800 psia (0,03 to 55,2 bar)
- Range 4: 0.5 to 3,626 psia (0,03 to 250 bar)

Gage Sensor

Limits

- Range C: 0 to 800 psig (0 to 55,2 bar)
- Range D: 0 to 3,626 psig (0 to 250 bar)

Over Pressure Limit

0.5 psia (0,03 bar) to two times the absolute pressure sensor range up to a maximum of 3,626 psia (250 bar).

Static Pressure Limit

Operates within specifications between static line pressures of 0.5 psia (0,03 bar) and the URL of the absolute pressure sensor.

Power

3095FB

- Quiescent supply current 10 mA typical. Transmitting supply current not to exceed 100 mA.
- External power supply required
- Transmitter: operates on terminal voltage of 7.5 - 30 Vdc

3095FC

- Transmitter: operates on terminal voltage of 8 - 28 Vdc
- Input current: 5mA nominal, 9.5 mA at 100% duty cycle (battery charging not included)
- Internal battery: rechargeable, Nominal 6.2 Vdc (2.5 Amp/hr)
- Maximum power consumption: 19 watts
- Solar panel input: nominal 8 V to 200 mA
- Solar panel output: 2 watts, 9 V nominal
- External charging input: 12 Vdc max (8 - 10 Vdc nominal)

RS-485 Signal Wiring

2-wire half-duplex RS-485 MODBUS with 8 data bits, 1 stop bit, and no parity

Bus Terminations

Standard RS-485 bus terminations required per EIA-485.

Failure Mode Alarm

If self-diagnostics detect a gross transmitter failure, non-latched status bits are set in the transmitter alarm registers.

Humidity Limits

3095FB

- 0 - 100% relative humidity

3095FC

- 0 - 95%, non condensing

Communications

PC-Based User Interface Software

Baud Rate: 3095FB - 1200 to 9600 User selectable
3095FC - 600 to 19.2K User selectable

Host: 3095FB - RS485 (MODBUS)

3095FC - RS485 (MODBUS) or RS-232 Direct Connect

User Interface Software and Hardware Requirements:

3095FB

- IBM-compatible PC
- 10 MB of available hard drive space
- Microsoft® Windows® 98 or higher operating system
- CD-ROM drive
- 32 MB of RAM

3095FC

- IBM-compatible PC
- 1 MB of RAM
- Pentium-grade processor: 233 MHz or faster
- Microsoft Windows 98 or higher operating system
- CD-ROM drive

Temperature Limits

Process (at transmitter isolator flange for atmospheric pressures and above):

3095FB

- With standard Silicon Fill Sensor: -40 to 250 °F (-40 to 121 °C)
- Inert Fill Sensor: 0 to 185 °F (-18 to 85 °C).
- Process temperatures above 185 °F (85 °C) requires derating the ambient limits by a 1.5:1 ratio.

3095FC

- With standard Silicon Fill Sensor: -40 to 212 °F (-40 to 100 °C)
- Inert Fill Sensor: 0 to 185 °F (-18 to 85 °C).
- Process temperatures above 185 °F (85 °C) requires derating the ambient limits by a 1.5:1 ratio.

Ambient:**3095FB**

- With Standard Silicon Fill Sensor:
-40 to 185 °F (-40 to 85 °C)
- With LCD Display⁽¹⁾: -40 to 175 °F (-40 to 80 °C)

3095FC

- -40 to 167 °F (-40 to 75 °C)
- With LCD Display: -4 to 167 °F (-20 to 75 °C)

Storage:**3095FB**

- -50 to 212 °F (-46 to 100 °C)
 - With LCD Display: -40 to 185 °F (-40 to 85 °C)
- 3095FC**
- -50 to 185 °F (-46 to 85 °C)
 - With LCD Display: -40 to 185 °F (-40 to 85 °C)

(1) LCD Display may not be readable and LCD updates will be slow at temperatures below -4 °F (-20 °C).

Turn-on Time

Process variables will be within specifications less than 4 seconds after power is applied to transmitter.

Damping (3095FB only)

Response to step input change can be user-selectable from 0.1 to 30 seconds for one time constant. This is in addition to sensor response time of 0.2 seconds.

Filtering (3095FC only)

Response to step input change can be filtered by user entered percentage of add value to be used.

(Last Value X Entered %) + [New Value X (100 - Entered %)] = Filtered Value

Real Time Clock (3095FC only)

- Year / month / day / hour / minute / second
- Battery backed

Performance Specifications

(Zero-based spans, reference conditions, silicone oil fill, 316 SST isolating diaphragms, and digital trim values equal to the span end points.)

Specification Conformance

The Rosemount 3095 maintains a specification conformance of measured variables to at least 3σ.

Differential Pressure**Range 2**

0–2.5 to 0–250 inH₂O (0–6,23 to 623 mbar)
(100:1 rangeability is allowed)

Range 3

0–10 to 0–1000 inH₂O (0–25 mbar to 0–2,5 bar)
(100:1 rangeability is allowed)

Accuracy (including Linearity, Hysteresis, Repeatability)

Range 2-3: 3095FB Ultra for Flow (Option U3)⁽¹⁾

- ±0.05% of DP reading up to 3:1 DP turndown from URL
- For DP turndowns up to 100:1 from URL

$$\text{Accuracy} = \pm \left[0.05 + 0.0145 \left(\frac{\text{URL}}{\text{DP Reading}} \right) \right] \% \text{ of DP Reading}$$

Range 2-3: 3095FB and 3095FC

- ±0.075% of span for spans from 1:1 to 10:1 URL
- For spans less than 10:1 rangedown

$$\text{Accuracy} = \pm \left[0.025 + 0.005 \left(\frac{\text{URL}}{\text{Span}} \right) \right] \% \text{ of span}$$

Ambient Temperature Effect per 50 °F (28 °C)

Range 2-3: 3095FB Ultra for Flow (Option U3)⁽¹⁾

- ±0.130% of DP reading up to 3:1 DP turndown URL
- ±[0.05 + 0.0345 (URL/DP Reading)]% of DP Reading up to 100:1 DP turndown from URL

Range 2-3: 3095FB and 3095FC

- ±(0.025% URL + 0.125% span) spans from 1:1 to 30:1
- ±(0.035% URL - 0.175% span) spans from 30:1 to 100:1

Static Pressure Effects

- Zero error = ±0.05% of URL per 1000 psi (68,95 bar)
- Span error = ±0.20% of DP Reading per 1000 psi (68,95 bar)

Stability

Range 2-3: 3095FB Ultra for Flow (Option U3)⁽¹⁾

- ±0.25% of URL for 10 years for ±50 °F (28 °C) temperature changes, and up to 1000 psi (68,95 bar) line pressure

Range 2-3: 3095FB and 3095FC

- ±0.125% of URL for five years for ±50 °F (28 °C) ambient temperature changes, and up to 1000 psi (68,95 bar) line pressure.

Absolute/Gage Pressure**Absolute (100:1 rangeability allowed)****Range 3**

0.5–8 to 0.5–800 psia (0,03–0,552 to 0,03–55,2 bar)

Range 4

0.5–36.26 to 0.5–3,626 psia (0,03–2,5 to 0,03–250 bar)

Gage (100:1 rangeability allowed)**Range C**

0–8 to 0–800 psig (0–0,552 to 0–55,2 bar)

Range D

0–36.26 to 0–3,626 psig (0–2,5 to 0–250 bar)

Ambient Temperature Effect per 50 °F (28 °C)

- ±(0.05% URL + 0.125% of span) spans from 1:1 to 30:1
- ±(0.06% URL - 0.175% of span) spans from 30:1 to 100:1

(1) Ultra for Flow (Option U3) applicable for 3095FB DP ranges 2 and 3 with SST isolator material and silicone fill fluid only.

Stability

±0.125% of URL for five years for ±50 °F (28 °C) ambient temperature changes.

Accuracy (including Linearity, Hysteresis, Repeatability)

- ±0.075% of span for spans from 1:1 to 10:1 of URL
- For spans less than 10:1 rangedown,
Accuracy = ± $\left[0.03 + 0.0075\left(\frac{\text{URL}}{\text{Span}}\right)\right]$ % of span

Process Temperature (RTD)

Specification for process temperature is for the transmitter portion only. Sensor errors caused by the RTD are not included. The transmitter is compatible with any PT100 RTD conforming to IEC 751 Class B, which has a nominal resistance of 100 ohms at 0 °C and $\alpha = 0.00385$. Examples of compatible RTDs include the Rosemount Series 68 and 78 RTD Temperature Sensors.

Sensing Range

3095FB

- 300 to 1500 °F (-184 to 816 °C)

3095FC

- 40 to 464 °F (-40 to 240 °C)

Accuracy (including Linearity, Hysteresis, Repeatability)

- ±1.0 °F (0.56 °C) for process temperatures from -300 to 1200 °F (-184 to 649 °C)
- For process temperatures above 1200 °F (649 °C), add ±1.0 °F (0.56 °C) per 100 °F (38 °C)

Ambient Temperature Effects per 50 °F (28 °C)

3095FB

- ±0.72 °F (0.40 °C) for process temperatures from -40 to 185 °F (-40 to 85 °C)
- (±1.28 °F (0.72 °C) + 0.16% of reading) for process temperatures from 185 to 1500 °F (85 to 816 °C)

3095FC

- ±0.90 °F (0.50 °C) for process temperatures from -40 to 464 °F (-40 to 240 °C)

Stability

±1.0 °F (0.56 °C) for one year

Physical Specifications**Electrical Connections**

- ½–14 NPT, M20 x 1.5 (CM20), PG-13.5
- ¾–14 NPT (3095FC only)

RTD Process Temperature Input:

100-ohm platinum RTD per IEC-751 Class B

Process Connections

- Transmitter: ¼–18 NPT on 2¹/₈-in. centers
- RTD: RTD dependent (see ordering information)

Radiated/Conducted Transmissions

Meets requirements of IEC 61326

Process Wetted Parts

Isolating Diaphragms

- 316L SST or Alloy C-276

Drain/Vent Valves

- 316 SST or Alloy C-276

Flanges

- Plated carbon steel, 316 SST, or Cast C-276

Wetted O-rings

- Glass-Filled PTFE

Non-Wetted Parts

Electronics Housing

- Low copper aluminum

Bolts

- Plated carbon steel per ASTM A449, Grade 5; or austenitic 316 SST

Fill Fluid

- Silicone oil
- Inert oil (available for gage pressure ranges only)

Paint

- Polyurethane

O-rings

- Buna-N

Battery (3095FC only)

- Lead-acid, rechargeable

Weight

Components	Weight in lb. (kg)	
	3095FB	3095FC
3095 Transmitter	6.0 (2.7)	11.5 (5.2)
LCD Meter	0.5 (0.2)	0.6 (0.3)
SST Mounting Bracket	1.0 (0.5)	1.0 (0.5)
12 ft (3.66 m) RTD Shielded Cable	0.5 (0.2)	–
12 ft (3.66 m) RTD Armored Cable	1.1 (0.5)	–
24 ft (7.32 m) RTD Shielded Cable	1.0 (0.4)	–
24 ft (7.32 m) RTD Armored Cable	2.2 (1.0)	–
75 ft (22.86 m) RTD Shielded Cable	1.9 (0.9)	–
75 ft (22.86 m) RTD Armored Cable	7.2 (3.2)	–
12 ft (3.66 m) RTD ATEX/IECEX Cable	2.1 (0.9)	–
24 ft (7.32 m) RTD ATEX/IECEX Cable	3.0 (1.4)	–
75 ft (22.86 m) RTD ATEX/IECEX Cable	4.8 (2.2)	–
Battery / Solar panel	–	2.0 (0.9)
Battery Backup	–	1.3 (0.6)

3095FC Memory Specifications**Programmable Memory**

2 MB x 8 flash EPROM

Data Memory

512 kB SRAM

Boot Memory

128 kB flash EPROM

History Database

The history database archives measured and calculated values for on-demand viewing or saving to a file. Each point in the historical database can be configured to archive the current value, average value, totalized value, or accumulated value.

Up to 35 standard history points provided, with archiving of min/max (for today and yesterday), minute (for last 60 minutes), hourly and daily values (for last 35 days). The first 8 of these are non-configurable.

Up to 15 extended history points provided with archiving of up to 5040 entries at 1, 2, 3, 4, 5, 10, 12, 15, 20, 30, or 60 minute intervals.

Memory Logging

- 240 alarms before rollover
- 240 events before rollover

3095FC Flow Specifications

Flow Calculation:

- Computed in accordance with ANSI/API 2530-92 (AGA 3, 1992), API 14.2 (AGA 8, 1992), and API 21.1. Detail, Gross I, Gross II.

Product certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

European Pressure Equipment Directive (PED) (97/23/EC)

3095F_2/3,4/D Flow Transmitters — QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller — Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold — Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (2004/108/EC)

3095F Flow Transmitters - EN61326-1:2006, EN61326-2-3:2006

Ordinary Location Certification for Factory Mutual

As standard, the Rosemount 3095FB transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

Hazardous Locations Certifications

North American Certifications

FM Approvals

- A 3095FB
Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/III, Division 1, Groups E, F, and G, hazardous locations. Factory Sealed. Provides non-incendive RTD connections for Class I, Division 2, Groups A, B, C, and D. Install per Rosemount drawing 03095-1025. Enclosure Type 4X.

Canadian Standards Association (CSA) - Canada only

- C 3095FB
Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/III, Division 1, Groups E, F, and G, hazardous locations. CSA enclosure Type 4X. Factory Sealed. Provides a non-incendive RTD Connection for Class I, Division 2, Groups A, B, C, and D. Suitable for use in Class I, Division 2, Groups A, B, C, and D. Install in accordance with Rosemount Drawing 03095-1024.

Canadian Standards Association (CSA) - U.S. and Canada

- M 3095FC
Explosion-Proof for Class I, Division 1, Groups C and D including optional solar panel: mast option: Suitable for use in Class I, Division 2, Groups A, B, C, D, and T3. CSA Enclosure Type 4.

European Certifications

- H ATEX Flameproof
3095FB
Certificate Number: KEMA02ATEX2320X  II 1/2 G
EEx d IIC T5 (-50°C ≤ T_{amb} ≤ 80°C)
T6 (-50°C ≤ T_{amb} ≤ 65°C)

V_{max} = 55V dc

CE 1180

Special Conditions for Safe Use (x):

The device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

3095FC

Certificate Number: LCIE05ATEX6057X  II 2 G
EEx d IIB T5

V_{max} = 28V dc

IP66

CE 1180

Special Conditions for Safe Use (x):

Operating ambient temperature: -40°C to 75°C

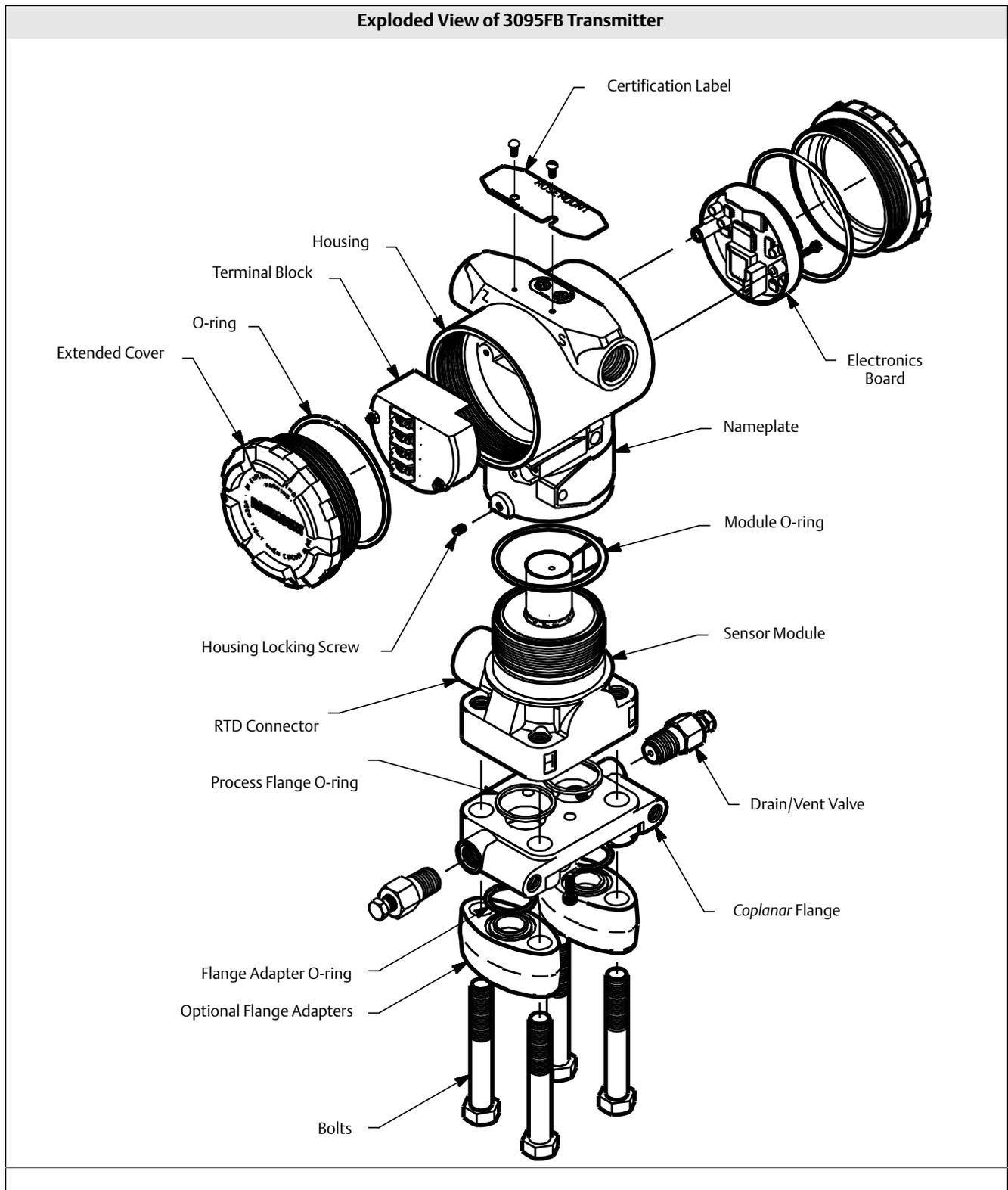
The users have to make sure that the thermal fluid transfer doesn't overheat the equipment to a temperature corresponding to the spontaneous combustion temperature of surrounding gas.

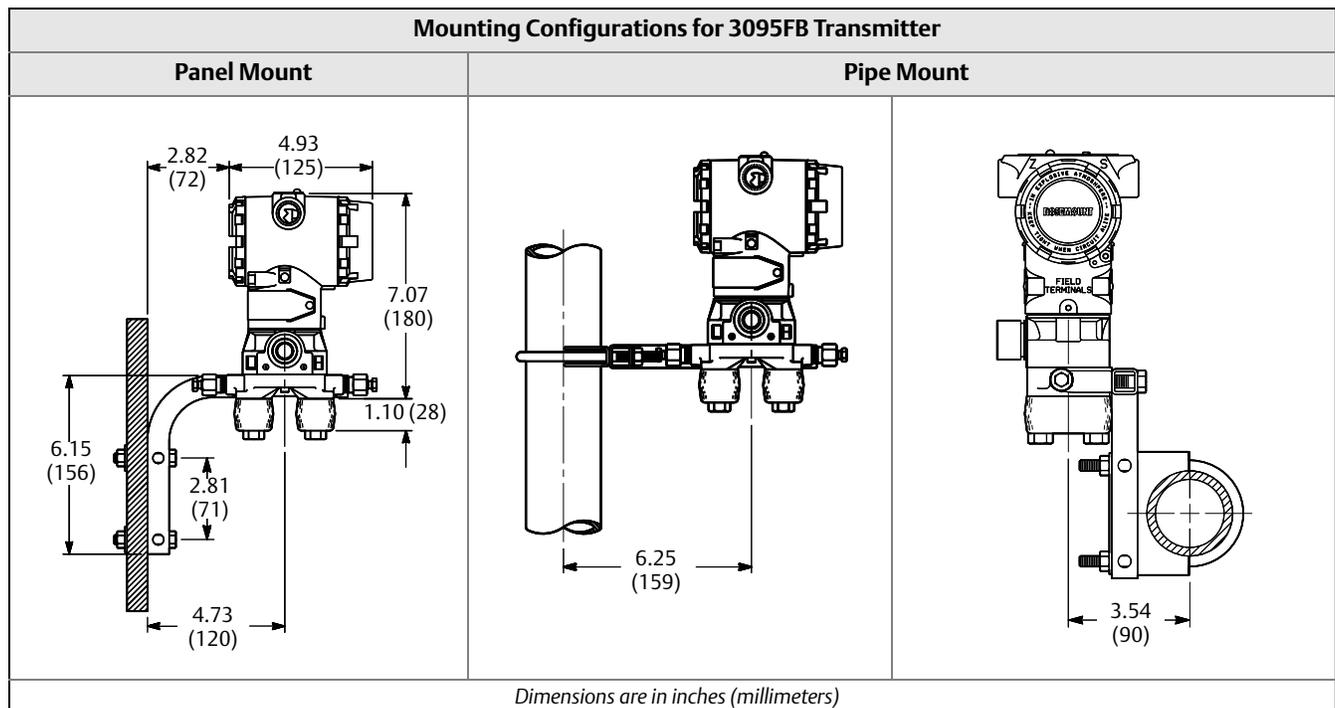
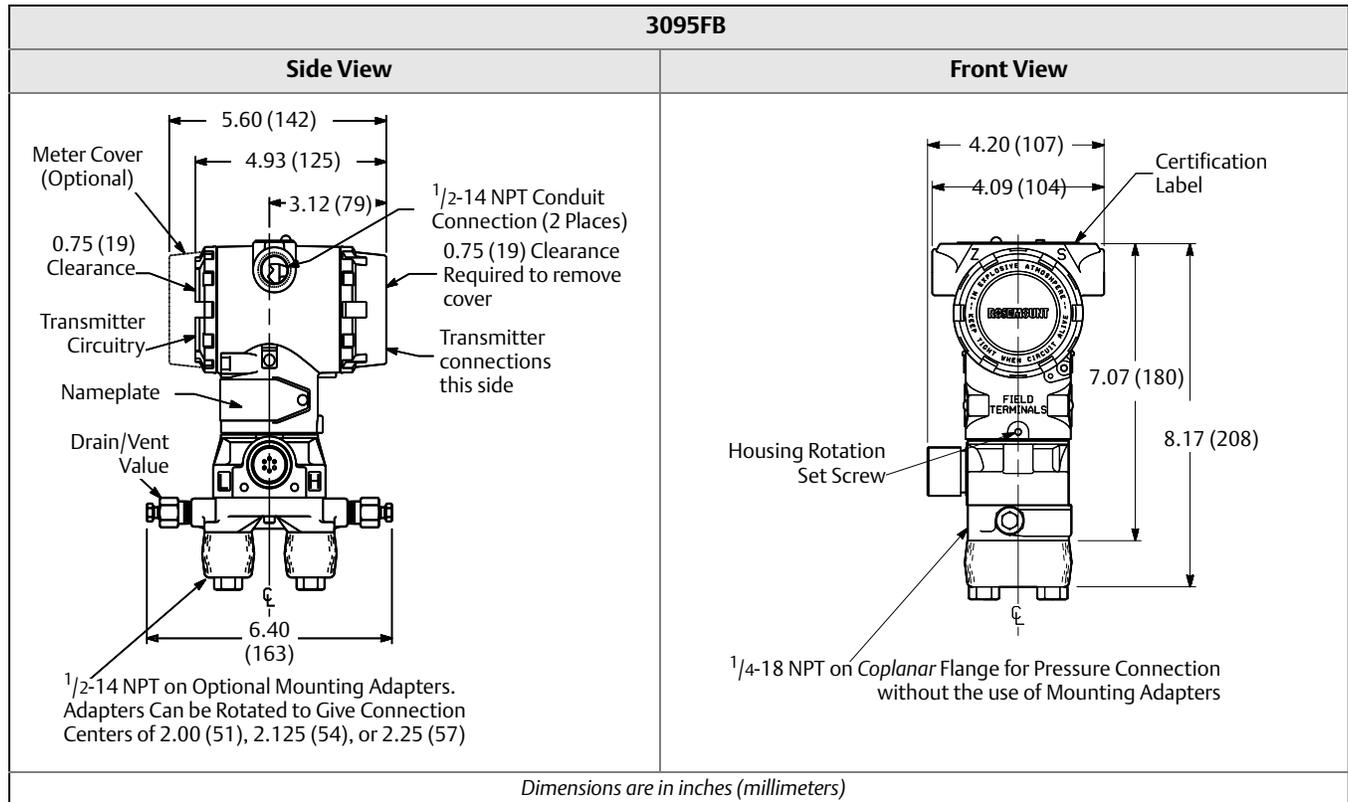
P ATEX Dust
3095FB
Certificate Number: KEMA02ATEX2321  II 1 D T90°C
Ambient Temp ($-50^{\circ}\text{C} \leq T_{\text{amb}} \leq 80^{\circ}\text{C}$)
V = 55 Vdc MAX
I = 23 mA MAX
IP66
CE 1180

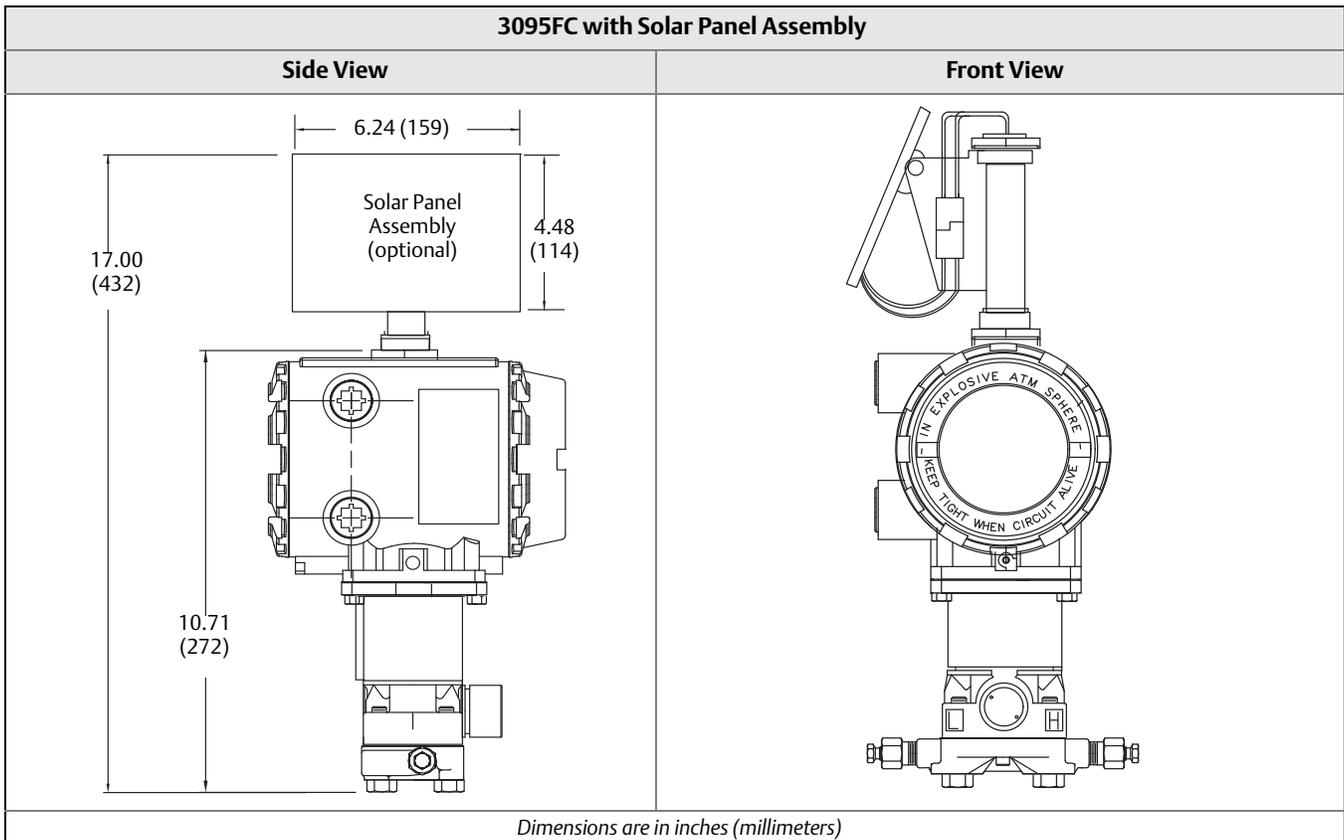
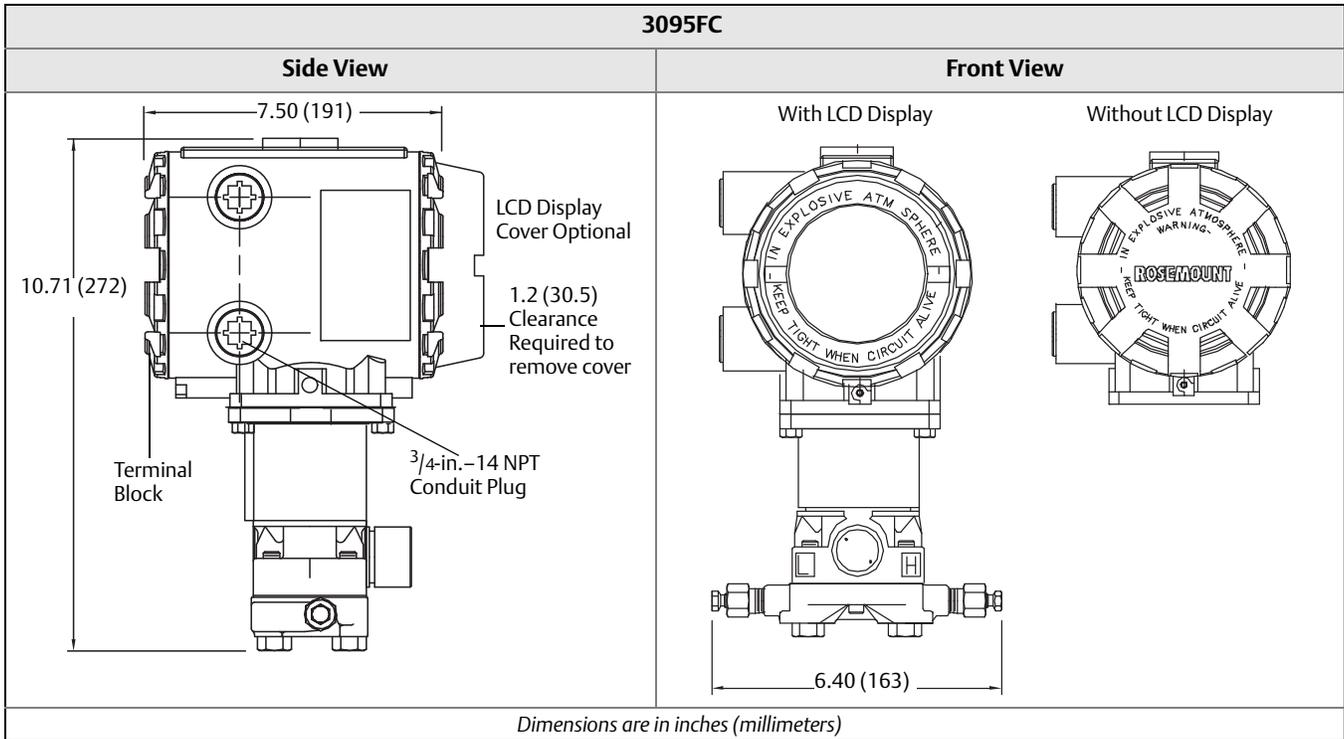
IECEX Certifications

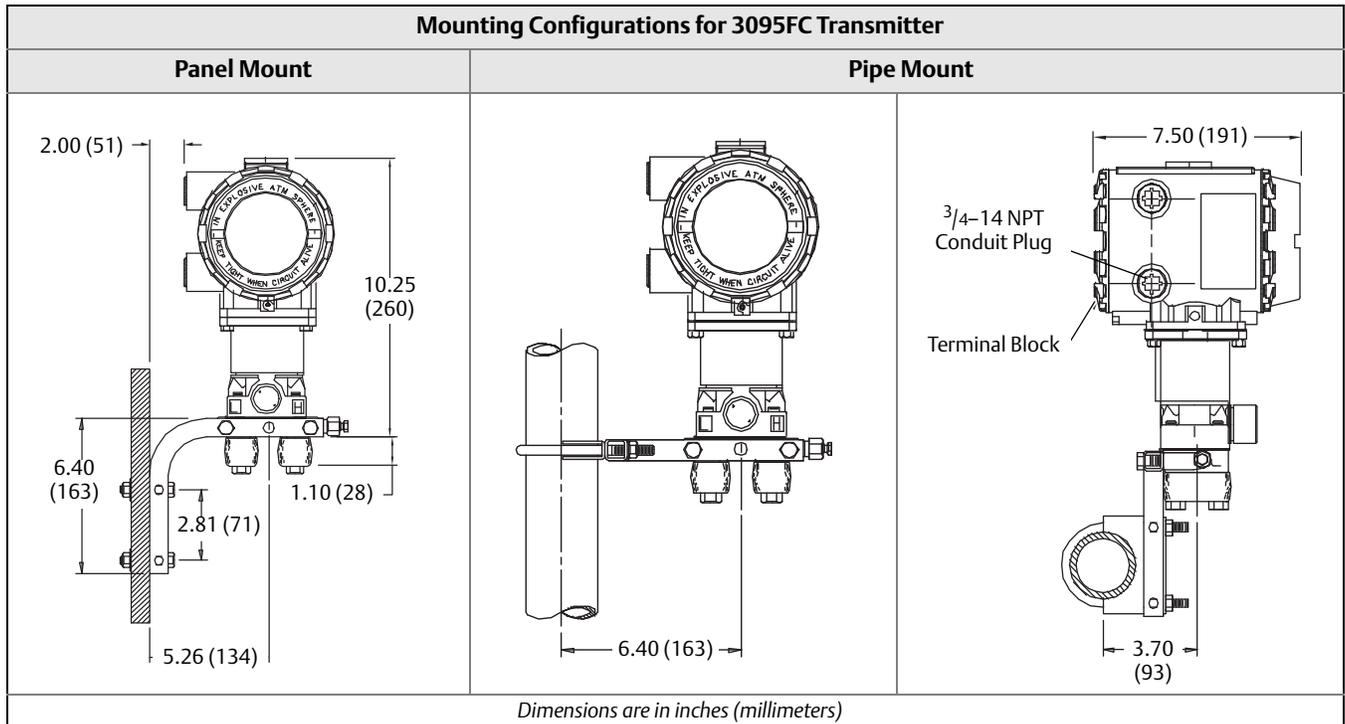
- 7 IECEx Flameproof
3095FB
Certificate Number: IECEx KEM 06.0018
Zone 0/1 Ex d IIC T6 ($-20^{\circ}\text{C} \leq T_a \leq 65^{\circ}\text{C}$)
Zone 0/1 Ex d IIC T5 ($-20^{\circ}\text{C} \leq T_a \leq 80^{\circ}\text{C}$)
 $V_{\text{max}} = 55 \text{ Vdc}$
 $I_{\text{max}} = 23 \text{ mAdc}$
- 8 IECEx Dust
3095FB
Certificate Number: IECEx KEM 06.0018
Ex tD A22 T90°C
IP66

Dimensional drawings









Options

Standard Configuration

Unless otherwise specified, the transmitter is shipped as follows:

Engineering units:	
Differential	inH ₂ O
Absolute/gage	psi
Output:	MODBUS RTU protocol signal
Flange type:	Specified model code option
Flange material:	Specified model code option
O-ring material:	Specified model code option
Drain/vent:	Specified model code option
Flow Configuration Parameters:	Factory default
Software tag:	(Blank)

Custom Configuration (Option Code C1)⁽¹⁾

If Option Code C1 is ordered, the user-specified information and standard configuration parameters are factory configured. Unspecified parameters will remain at the factory default settings.

(1) 3095FC only allows all English or all Metric units.

Tagging

Three customer tagging options are available:

- Standard SST tag is wired to the transmitter. Tag character height is 0.125 in. (3.18 mm), 85 characters maximum.
- Tag may be permanently marked on transmitter nameplate upon request. Tag character height is 0.0625 in. (1.59 mm), 65 characters maximum.

- Tag may be stored in transmitter memory. Software tag is left blank unless specified.
- Software tag is left blank unless specified.

Optional 305 Integral Manifolds

The Rosemount MultiVariable transmitters with 305R Integral Manifold are fully assembled, calibrated, and seal tested by the factory. Refer to PDS 00813-0100-4733 for additional information.

Accessories

3095 User Interface Software Packages

The User Interface software package is available with or without the converter and connecting cables. All configurations are packaged separately.

Windows 98 or higher

3095FB

- Part Number 03095-5130-0003: Windows User Interface Software—Single PC License, Converter, and Cable.
- Part Number 03095-5125-0004: Windows User Interface Software—Single PC License.
- Part Number 03095-5125-0005: Windows User Interface Software—Site License.
- Part Number 03095-5106-0002: RS-485 Converter and Cable.

3095FC

- Part Number 03095-5136-0001: Windows User Interface Software—Single PC License, and Cable.
- Part Number 03095-5135-0001: Windows User Interface Software—Single PC License.
- Part Number 03095-5135-0002: Windows User Interface Software—Site License.
- Part Number 03095-5106-0003: 10 foot (3.05 m) 9-pin Serial Cable (For direct connect method)

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ST100 Series Flare Gas Flow Meters

FCI FLUID COMPONENTS
INTERNATIONAL LLC

Flow Meter Solutions for Land Based and Offshore Platform Flares



Flaring systems are used to burn-off and dispose of waste, excess or off-gases, and as a safety system to protect processes and equipment. They are found throughout the world in oil and gas processing systems, refineries and petrochemical plants. Flare flow meters are a critical component used in these systems to monitor, measure and report the gas flows within these systems. Flare flow meters provide plant operations with a tool to signal abnormal process changes, early leak detection, and report on flared gases to comply with environmental agency reporting.

ST100 Series Flare Gas Flow Meters

- Oil, gas, petrochemical plant flares and feed lines
- LP and HP flare applications
- Environmental agency and emission trading compliance with exclusive SR2x™ option
- Lowest total installed cost solution
- Flow range from 0.25 SFPS to 1000 SFPS [0,07 NMPS to 305 NMPS]
- Mixed hydrocarbon gases calibration
- Up to five (5) separate, unique calibrations
- Direct mass flow measuring; no need for temperature and pressure sensors
- Up to 1000:1 turndown
- Patented in-situ calibration verification option
- Analog outputs or digital bus communications
- Global agency approvals for Ex installations
- Exclusive dual-element systems for larger flare lines
- All stainless steel enclosure option for offshore installations
- Auxiliary input channels for interface with gas analyzers

FCI has been a leading provider of flare gas flow meter solutions for more than two decades. FCI flow meters are installed in both land-based and offshore platform flare systems throughout the world. The new ST100 Series flow meters leverage these experiences with extensive features and functions that extend and optimize their application in flare flow measurement.

Whether your flares are single-line or a large flaring system with a complex array of tributary lines and mixed gases, there is an FCI solution. From superior low flow measurement to detect the smallest leaks and up to 1000 SFPS [305 NMPS] to accurately measure major upset conditions at very high flows, FCI ST100 Series flow meters are your best solution.

The ST100 Series flow meters combine a broad range of easy to install insertion flow elements with industry's most powerful and flexible electronics/transmitter and specialized, precision flare gas calibrations. With wide turn downs, specific calibrations for mixed gas compositions, FCI exclusive SR2x split-range/dual calibration (see page 3), and maximum output flexibility with 4-20mA analog outputs or bus communications such as HART, FOUNDATION™ fieldbus, or Modbus, ST100 Series delivers a truly state-of-the-art gas flow meter for industrial process, plant and offshore flare applications.

ST100 Series Features

Four conduit ports provide greatest signal integrity and separation for power input, analog output lines, digital I/O, relays and/or auxiliary input signals; choice of NPT or M20 threads

AC or DC power supply

Weather-proof, ruggedized, Ex rated enclosures

- Choices for local or remote mounting
- NEMA 4X, IP67
- Aluminum or optional all stainless steel

Global agency approvals of entire instrument system for hazardous location installations:

FM, FMc, ATEX, IEC, NEPSI, CPA, Inmetro, GOST*

Multiple calibrations

- Up to five independent, separate calibrations
- Same gas, different flow range to optimize accuracy and extend turndown up to 1000:1
- Exclusive SR2x™ split range / dual calibration

Precision calibration and calibration choices

- Specific gas and application matched calibration in FCI NIST traceable facility

Extensive selection of process connections

- Retractable packing gland assemblies
- Fixed connections
- ANSI or DIN flanges
- Simple, adjustable installation with threaded NPT connector

Stainless steel or Hastelloy-C276 wetted parts



Remote up to 1000' [300 m]



Extensive analog and digital communications output choices

- Triple 4-20 mA with HART
- FOUNDATION™ fieldbus H1
- PROFIBUS PA
- Modbus RS-485
- 0-1 kHz or 0-10 kHz frequency or pulse
- Dual relays
- USB port
- Ethernet

On-board data logger

Four (4) optical touch buttons

- Proximity activation, no need to open enclosure
- Full instrument programmability
- Protected against unwanted activation

Comprehensive informational display

- Digital readout of all measured parameters; flow rate, total flow, temperature and pressure with engineering units
- Analog flow rate bar graph
- Alarm relay status indication
- Instrument fault indication
- User programmable 17 character field (example: display gas type, tag number or application/location)
- Display orientation rotates in 90° increments electronically
- Backlighted: auto-on activation via proximity sensor or set for always on

Multi-function: measures mass flow rate and temperature; STP Series adds pressure measurement

Permanent laser-etched depth gauge markings; ensures accurate centering of adjustable-length elements

All welded sensor elements for maximum service life and leak-proofing

Precision, wide-ranging platinum RTD sensors

Exclusive equal mass sensors provide optimum performance in processes with wide temperature swings

Choice of flow element styles to optimize application performance

- FP style (shown)
- S style

* Some approvals pending at time of publication; contact FCI for most current status

ST100 Series Flare Gas Flow Meters

FCI Exclusive Split-range, Dual Calibration – SR2x™ (Environmental Agency and Emissions Trading Compliance)

Many oil & gas operations, refineries and chemical plants have flare applications uniquely challenged with two diverse flow conditions, very low flow under normal conditions and very high flow during an upset/blowdown condition. These industries are then further challenged to comply with environmental agencies and emissions trading regulations for their flares stipulating flow meter accuracy of $\pm 5\%$ of reading throughout the entire measuring range. FCI answers this challenge with our exclusive SR2x split-range/dual calibration option in the ST100 Series which provides:

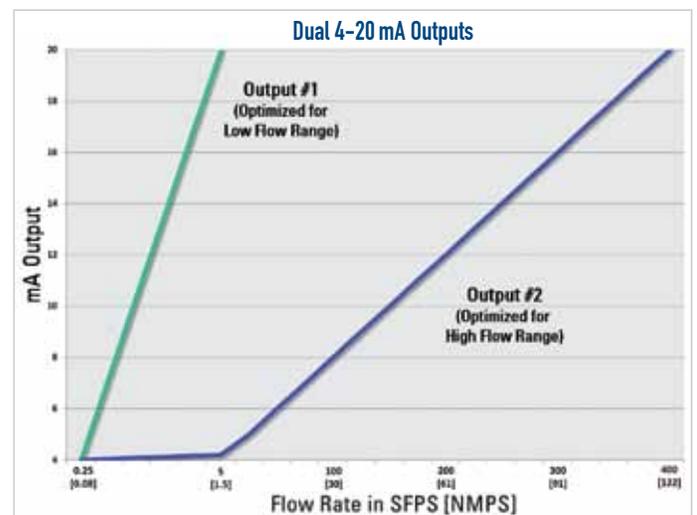
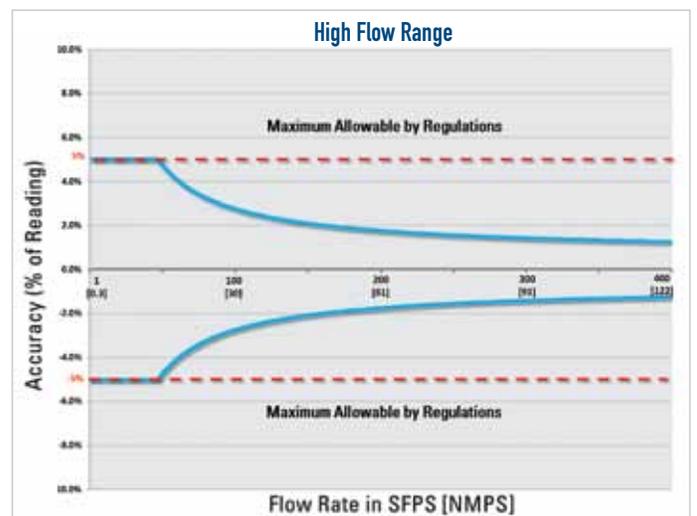
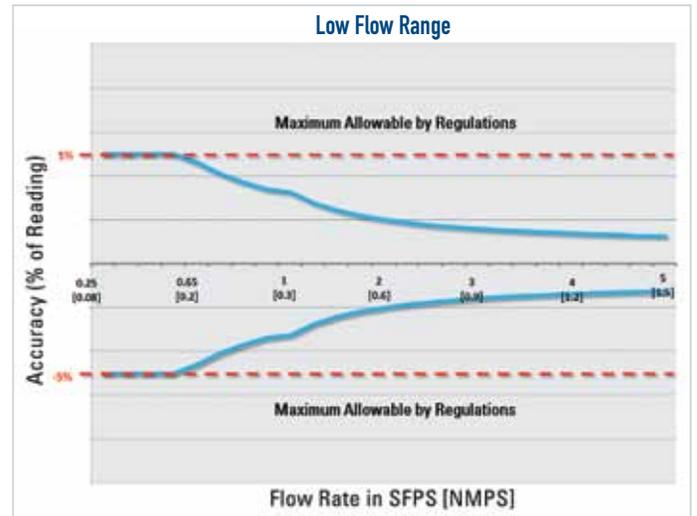
- **Split ranges:** Two separate and discrete ranges, one optimized in the low flow range and one optimized in the high flow range
- **Double calibration points** strategically placed and optimized in the low flow range and high flow range to achieve $\pm 0.75\%$ reading, $\pm 0.5\%$ of full scale to a maximum of $\pm 5\%$ of reading
- **Dual 4-20mA analog outputs:** One dedicated to the low flow range and the other to high flow range; this ensures maximum resolution of both the low flow and high flow range at the DCS, or, if any of the bus communications are specified, a single, contiguous high accuracy digital value over the entire flow range is sent to the DCS

When your flare application is characterized by this difficult low flow/high flow situation, FCI's ST100 Series will provide a regulatory compliant, exclusive thermal dispersion flow meter solution.

FCI Flare Gas Flow Meter Users *(partial list)*

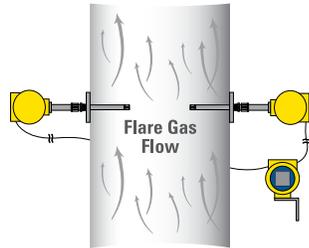
ADGAS	DAQING PETRO-CHEMICAL	HILDALGO PLATFORM	ENTERPRISES MURPHY EXPLORATION	SHANGHAI PETROCHEMICAL
AERA ENERGY	DEVON CANADA	HITCO CARBON COMPOSITES INC	NAM	SHELL
ALLIED PETRO-CHEMICAL LLC	DOW	HOLLY REFINING & MARKETING	NEO TAUNTON LLC	SHELL CHEMICAL
AMERADA HESS	DYNEGY	HOUSTON REFINING	NORCO / RESOLUTION LLC	SICHUAN PETROCHEMICAL
AMOCO TRINIDATE OIL CO	E.I. DUPONT	HUNTSMAN	ONEOK	SINCLAIR REFINERY
ANADARKO	EASTMAN CHEMICAL	INDIAN OIL CORP	ONGA	SINOPEC YANGZI PETROCHEMICAL
ANKOR ENERGY LLC	EL PASO PRODUCTION CO	INNOVENE USA LLC	ONGC	SIPETROL
AOC TEXAS CITY	ELK CITY OKLAHOMA PIPELINE	INVISTA INC	ORICA CHEMICALS	SOLUTIA INC
APACHE	EMPRESA PETRO EQUILON	IOCL	ORIGIN ENERGY	SOLVAY
ARKEMA	ENTERPRISES	KHALDA PETROLEUM	PAN AMERICAN ENERGY	SOMERSET ENERGY REFINING
ATLAS PIPELINE	EQUISTAR CHEMICALS	KINDER MORGAN	PASADENA HYDROGEN PLANT	SUNCOR
ATOFINA	ERG	KUWAIT NATIONAL PETROLEUM	PECTEN CAMEROON CO	SYNERGAS
ATOFINA PETRO-CHEMICALS	ETHYL PETROLEUM ADDITIVES INC	LASMO	PEMEX	TALISMAN ENERGY
BAPCO	EVALCO	LDH ENERGY	PENN WEST PETROLEUM LTD	TARGA RESOURCES
BASF CORP	EXCELVOR CORP	LUBRIZOL	PERTAMINA	TENNESSE GAS PIPELINE
BAYER MATERIAL SCIENCE	EXTERRAN	MARKWEST ENERGY	PETROBRAS	TESORO
BG EXPLORATION	EXXON MOBIL	MARTIN MIDSTREAM	PETROFAC	TEXAS EASTMAN
BOAP OLEFINS	EXXON MOBIL CHEMICAL	MARYSVILLE HYDROCARBONS	PETRONAS	TOTAL
BOSNA - S OIL	FOREST OIL	MERIT ENERGY	PETROZUATA	TOTAL PETRO-CHEMICALS
BP	FORTISTAR	MILLENIUM PETROCHEMICALS	POLIMERI	UNION CARBIDE
BUIMI CARE OFFSHORE PRODUCTION	METHANE GROUP	MM PRIMA DESHECHA ENERGY LLC	PPG INDUSTRIES	UNITED GASCO
CARMEL OLEFINS	FRONTIER EL	MOBIL CHEMICAL INC	QUIMEX	VALERO
CENEX	DORADO REFINING	MOTIVA	REPSOL	VENOCO
CEPSA	GASCO		SABIC	WILLIAMS FIELD SERVICES
CHEVRON	GODLEY GAS PLT		SABINE PLANT	WRB REFINING LLC
CHEVRON PHILLIPS	GULF ISLAND LLC		SAUDI ARAMCO	YANSHAN PETROCHEMICAL
CHEVRON TEXACO	GULF LIQUIDS LLC		SECCO	ZHAIKMUNAI OIL
CONOCO PHILLIPS				

Examples of Performance in 0.25 SFPS to 400 SFPS [0.08 NMPS to 122 NMPS]



Dual-Element Systems

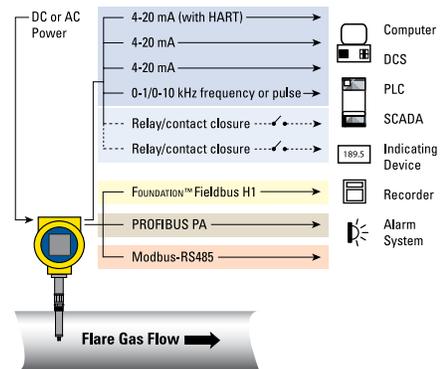
In pipe sizes larger than 16 inches [406 mm] a dual-element averaging system may provide better measurement performance and a more viable solution when it is impractical or impossible to provide the required straight-run or installation of a flow conditioner is difficult. ST100 Series models ST102A, ST112A, STP102A, and STP112A are dual-element averaging systems.



To determine if your flare meter application will benefit from using a dual-element averaging design, submit an FCI application data sheet or use AVAL, FCI's online flow meter sizing tool.

Communicate the Flow

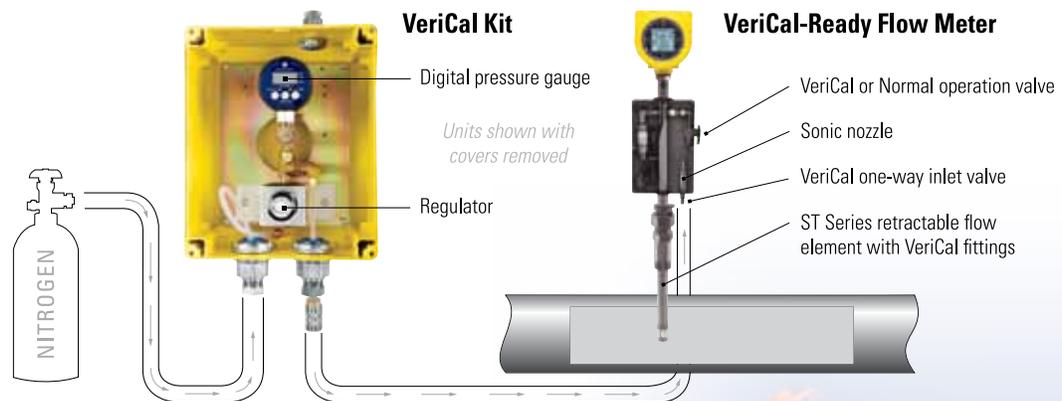
Local readout, multiple 4-20 mA analog outputs, digital bus communications including HART, FOUNDATION™ fieldbus, Modbus and more, are all available with ST100 Series to provide the flare flow data to you and your systems. There is simply no other flare meter with the comprehensive selection of interfaces as ST100 Series. And, should you ever want to change or upgrade, ST100 is field upgradeable to any of the available outputs.



VeriCal™ In-Situ Calibration Verification

Many flare meter installations, either per plant edict or for compliance with environmental regulations, require regular validation of calibration. Traditionally this has required a cumbersome and costly project to remove the meter from service and return it to a lab, which is particularly frustrating if the meter is found to still be within calibrated specifications. FCI's exclusive VeriCal option eliminates the need for unnecessary de-installation. The VeriCal system provides

a simple-to-use tool to verify the FCI flow meter is still within calibration without extracting the meter from pipe. The VeriCal system consists of a special VeriCal ready flow sensor, a portable VeriCal Kit (which can be used with any number of VeriCal-ready ST100 flow meters) and an additional benchmark calibration document to which field verification samples are compared. For more detailed information on VeriCal, please refer to FCI ST100 Series brochure.



Nitrogen and hose user supplied

"FCI flow meters have been providing accurate and easy-to-obtain venting data at our offshore facilities."

– M. Skaer, Facilities Engineer
ANKOR Energy LLC





Flare gas applications present several unique challenges to plant, process and instrument engineers when selecting a flow meter solution. These can include many or even all of the following:

- **Both low and high flow conditions** – low flow sensitivity is critical to capture leaking relief valves and sensing air leaking into system, and very high flows occur during upset conditions
- **Mixed gases** – flow meter calibration specifically for hydrocarbon composition gases and matched to actual process conditions
- **Large pipe sizes** – as line sizes increase effective and suitable flow metering technologies decrease
- **Lack of available straight-run** – larger line size and limited real estate, particularly on off-shore platforms, are restrictive to providing required straight-run to achieve repeatable flow metering accuracy
- **Compliance with local environmental regulations** – meet performance and calibration procedures mandated within local regulations such as US EPA's 10 CFR 40; 40 CFR 98; EU Directives 2003/87/EC and 2007/589/EC; US MMR 30 CFR Part 250, Subpart K, Section 250 and others
- **Limited access** – Pipe access and reaccess for installation, maintenance or servicing is difficult; spool-piece flow meters may require prolonged process shut-down and extensive on-site labor costs to install
- **Agency approvals for installation in hazardous (Ex) locations** – The entire flow metering instrument should carry agency approval credentials for installation in environments with potential hazardous gases; enclosure only ratings are inadequate (and risky)
- **Offshore platforms corrosive salt water** – offshore platform may require use of stainless steel on all exposed instrument materials, including sensors, process connections and enclosures

Key Criteria For Flare Flow Meter Selection

- Meet local environmental agency requirements for accuracy and periodic calibration verification
- Wide turndown for both low flow and high flow conditions
- Certified calibration for mixed hydrocarbon flare gases
- Multiple calibrations for variations in composition
- Direct mass flow measurement
- Easy to install, minimal penetration points
- Non-clogging, non-fouling, no moving parts design for lowest maintenance
- Agency approved for installation in explosive gas classified environments
- Stainless steel wetted parts and optional stainless steel process connections and enclosure housings

Comparison of Flow Meters Applied in Flares

	FCI Thermal Dispersion	Ultrasonic	Optical
Purchase Cost	\$	\$\$\$	\$\$
Installation Costs	\$	\$\$\$\$	\$\$
Single Insertion Tap Installation	✓		✓
Sensor Alignment Critical		✓	
Flow Range ≥ 328 FPS [100 MPS]	1000 FPS [305 MPS] ✓	394 FPS [120 MPS] ✓	500 FPS [150 MPS] ✓
Turn-down to 1000:1	✓	✓	✓
Direct Mass Flow Measuring	✓	NO <i>(Additional expense, process tap points and wire-ups for temperature and pressure sensors)</i>	NO <i>(Additional expense, process tap points and wire-ups for temperature and pressure sensors)</i>
Meets Environmental Agency Specifications for Accuracy	✓	✓	✓
SR2x™ Split-Range, Dual Calibration	✓	NO	NO
Temperature Service to 850 °F [454 °C]	✓	NO 536 °F [280 °C]	NO 212 °F [100 °C]
Pressure Service to 1000 psi [70 bar]	✓	✓	NO 300 psi [20 bar]

If you have previously applied thermal mass flow meters in your flare applications, look no further than ST100 for your next generation solutions. If you have never considered thermal flow meters for your flares, FCI's ST100 Series provides unsurpassed features, functions, performance and calibrations optimized for flare applications that deliver the best possible solution.

General Specifications Summary

Instrument

- **Measuring Capability**
Flow rate, total flow and temperature (optional pressure)
- **Accuracy**
Flow
Standard: $\pm 0.75\%$ reading, $\pm 0.5\%$ full scale
With SR2x: $\pm 0.75\%$ reading, $\pm 0.5\%$ full scale or $\pm 5\%$ of reading – whichever is better
Temperature: $\pm 2^\circ\text{F}$ [$\pm 1, 1^\circ\text{C}$]
- **Repeatability**
Flow: $\pm 0.5\%$ reading
Temperature: $\pm 1^\circ\text{F}$ [$\pm 1^\circ\text{C}$]
- **Turndown Ratio**
Standard: Up to 1000:1
With SR2x: Low flow range 20:1 up to 40:1; high flow range up to 1000:1
Total effectively up to 4000:1

Flow Element

- **Material of Construction**
All-welded 316L stainless steel; Hastelloy-C optional
- **Operating Pressure**
Up to 1000 psig [69 bar (g)] depending on process connection type
- **Operating Temperature (Process)**
From -40°F to 850°F [-40°C to 454°C]
- **Pipe Sizes Supported**
2 1/2" to 99" [63 mm to 215 mm] *For smaller line sizes, see Model ST100L*
- **Process Connection**
Retractable packing glands 50 psi, 500 psi, 1000 psi [3,4 bar, 34 bar, 70 bar], ANSI or DIN flange adjustable; or welded fixed, compression fittings

Flow Transmitter/Electronics

- **Enclosures**
Polyester powder coated aluminum; optional all stainless steel; four (4) conduit ports threaded as 1/2" NPT or M20
- **Dust/Water Protection**
IP67, NEMA 4X
- **Power Supply**
24 Vdc or 85 Vac to 265 Vac

- **Remoteable**
Yes, up to 1000' [300 m]
- **Outputs**
Three (3) 4-20 mA with HART + one (1) frequency/pulse
Selectable as 0-1 kHz or 0-10 kHz
Three (3) 4-20 mA with HART + one (1) frequency/pulse
Selectable as 0-1 kHz or 0-10 kHz + two (2) 2A relays
With SR2x, one 4-20 mA output is dedicated to flow rate for low flow range, and one is dedicated to flow for high flow range
FOUNDATION fieldbus H1
PROFIBUS PA
Modbus RS-485
USB connected serial port and ethernet port always included
- **Inputs**
Two (2) 4-20 mA
- **Readout/Display and Optical Touch Buttons (Optional)**
Digital/graphical backlit LCD; displays all process measurements continuously; includes four (4) optically activated (through glass) programming buttons
- **Calibrations**
Up to five (5) unique calibrations stored and electronically selectable
- **Data Logger**
On-board micro-SD (secure digital) memory card; 2 GB capacity supplied, stores approximately 21 M readings

Other Options

- **VeriCal™ In-Situ Calibration Verification System**
- **Dual-Element Systems**
- **Pressure Measurement**
- **Vortab® Flow Conditioners**
- **Transmitter Sun Shield**

For complete details and specifications please see FCI's ST100 Series brochure – visit www.FluidComponents.com to request a copy or download a PDF

For smaller line applications (<2 1/2" [63 mm]) such as flare purge lines or assist gas feed lines, look to FCI in-line style flow meters – **ST100L** or **ST75-ST75V Series**.



FCI FLUID COMPONENTS INTERNATIONAL LLC

Locally Represented By:

Visit FCI online at www.FluidComponents.com | FCI is ISO 9001:2000 and AS9100 Certified

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GE

Measurement & Control

DigitalFlow™ GF868

Panametrics Flare Gas Mass Ultrasonic Flowmeter with Extended Performance Range



Applications

The DigitalFlow GF868 flowmeter is a complete ultrasonic flow metering system for:

- Flare gas
 - Track down or prevent losses from leakage with positive material identification
 - Account for total plant throughput of material
 - Reduce cost of steam usage with proportional control
 - Conserve energy by eliminating unnecessary flaring
 - Comply with government regulations for pollution control
- Vent gas

Features

- Measures velocity, volumetric and mass flow
- Standard velocity range to 100 m/s (328 ft/s) standard
- Extended velocity range to 120 m/s (394 ft/s) *
- Measures instantaneous average molecular weight
- Measures hydrocarbon gases
- Daily Zero and Span Self-Calibration Check, assuring accurate worry-free operation
- Delivers accurate flow rate, independent of gas composition
- Measures very low to very high velocity
- Field-proven installation techniques
- Built-in totalizers
- Built-in power supply for pressure and temperature transmitters
- 3940 to 1 turndown ratio
- One- or two channel/path configurations

*Velocity maximum may be higher in specific installations—consult with GE



Flare Gas Mass Flowmeter

The DigitalFlow GF868 ultrasonic flowmeter uses the patented Correlation Transit-Time™ technique, digital signal processing, and an accurate method of calculating molecular weight. Add to these features the inherent advantages of ultrasonic flow measurement—reliability with no routine maintenance, high accuracy, fast response, wide rangeability—and the DigitalFlow GF868 flowmeter is the clear choice for flare gas applications.

Correlation Transit-Time Technology is Ideal for Flare Gas Flow Measurement

The Correlation Transit-Time technique has distinct advantages over other methods of flare gas flow measurement, and it is used to solve a variety of difficult problems. Typically, gas in flare stacks, headers or laterals is a mixture of components from different sources. Flow rate in flare systems may be unsteady or even bidirectional. Pulsating pressure, varying composition and temperature, harsh environment, and wide flow range further complicate the measurement. The GF868 is designed for superior performance under these conditions.

Patented Molecular Weight Measurement Method

The DigitalFlow GF868 uses a patented method for calculating the average molecular weight of hydrocarbon mixtures. This proprietary algorithm extends the range for measuring average molecular weight, while improving accuracy and compensating for nonhydrocarbon gases better than ever before possible. Higher accuracy mass flow data and more precise knowledge of flare gas composition can improve the efficiency of plant operation, enabling correct metering of steam injection at the flare tip, rapid troubleshooting of leaks into the flare stream, early detection of process control problems, and accurate plant balance.

Best Technology for Flare Gas

Ultrasonic flow measurement, the ideal technology for flare gas applications, is independent of gas properties,

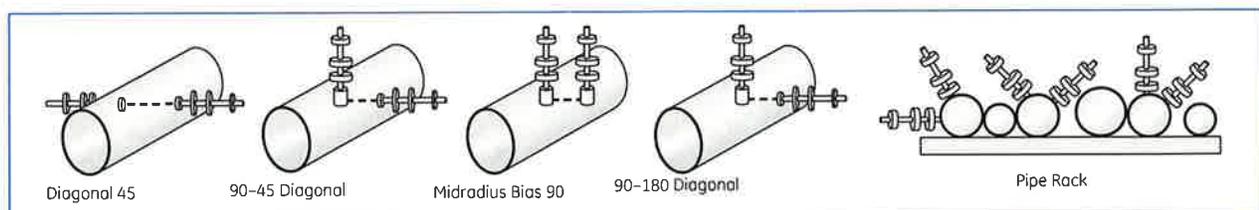
and does not interfere with the flow in any way. All-metal ultrasonic transducers installed in the pipe send sound pulses upstream and downstream through the gas. From the difference in these transit times between the transducers, with and against the flow, the DigitalFlow GF868's onboard computer uses advanced signal processing and correlation detection to calculate velocity, and volumetric and mass flow rate. Temperature and pressure inputs enable the meter to calculate standard volumetric flow. For maximum accuracy, use the two-channel version and measure along two different paths at the same location. The two-channel meter can also measure the flow in two separate pipes or at two different places on the same pipe.



Typical meter set-up for standard volumetric or hydrocarbon mass flow

Simple Installation

The flowmeter system consists of a pair of transducers for each channel, preamplifiers, and an electronics console. The transducers can be installed as part of a flowcell, or directly into the pipe with a hot- or cold-tapping procedure. The electronics console of the DigitalFlow GF868 meter can be located up to 1,000 ft (300 m) from

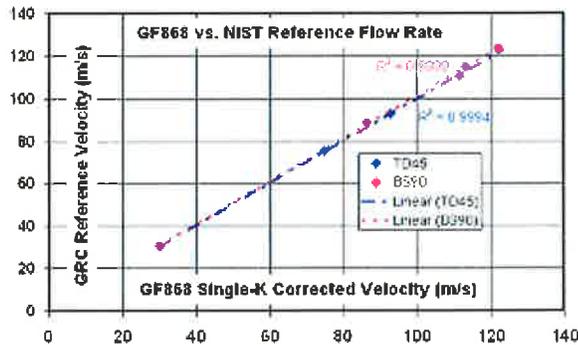


Standard transducer mounting configurations

One Meter, Wide Range of Flow Conditions

High Flow

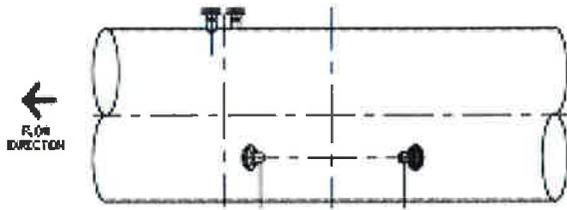
The DigitalFlow GF868 meter achieves a new standard rangeability of 3280 to 1 and a new Extended Range rangeability of 3940 to 1. It measures velocities from 0.1 to 328 ft/s (0.03 to 100 m/s) standard in both directions, while the Extended Range version measures velocities to 394 ft/s (120 m/s) in one direction, in steady or rapidly changing flow, in pipes from 2 in to 120 in (76 mm to 3 m) in diameter. With this range of operation, one DigitalFlow GF868 flowmeter performs measurements under most of the conditions that may occur in a flare line on or offshore. The extended velocity range to 100 m/s is enabled in standard meters with no loss of accuracy.



Contact GE for the report *Ultrasonic Flowmeter for Accurately Measuring Flare Gas over a Wide Velocity Range*.

Low Flow

For base load operation the volumetric flow in flares is often in the range 0.1 to 1 f/s (0.03 to 0.3 m/s) and the flare gas flowmeter improves the accuracy over that range, but still measures at high velocity during facility relief or upset conditions. Additional paths, longer paths, unconventional configurations and location of paths are used to achieve accurate low flow measurements. A combination of two types of installation with a two-channel meter allows low flow to be measured by the Diagonal 45 configuration, and the high flow by the Bias 90 configuration. The Diagonal 45 path has a longer path length, and measures the low velocity with a high accuracy while the Bias 90 measures the midrange and high flow rates.



A pipe showing a set of nozzles for Bias 90 on the top and a set for a mid-radius Diagonal 45 below

Identify Leak Sources, Reduce Steam Usage and Improve Plant Material Balance

Leaks and excess steam delivery are two major causes of loss of product and energy. Reducing them immediately improves the overall efficiency in refinery and chemical plant operation. Payback for the entire DigitalFlow GF868 installation usually occurs within a matter of months. The DigitalFlow GF868 can help save millions of dollars in reduced losses.

Once the sound speed of the gas has been determined by the DigitalFlow GF868, its on-board computer uses temperature and pressure inputs in conjunction with the sound speed to calculate instantaneous average molecular weight and mass flow rate of the gas. These parameters are used to help identify sources of leaks into the flare system. Detection of even a small increase in flow rate into the flare system may indicate a leak source such as partially unseated relief valve. An accompanying change in the average molecular weight of the flare gas may be used to help locate the leak source. Quick identification and elimination of leak sources into the flare system saves significant amounts of potentially lost energy and product.

Mass flow rate may be used to perform a mass balance calculation and to control flare tip steam injection. By knowing the exact amount of gas flow and average molecular weight in the flare stack, delivery of the correct amount of steam required at the flare tip can be accurately controlled. Steam usage can be reduced while maintaining compliance with pollution control regulations.

Designed for Flare Gas Environment

The DigitalFlow GF868 flowmeter has no moving parts to clog or wear out. Its patented ultrasonic transducers are constructed of titanium or other metals that withstand the corrosive environment usually found in flare gas applications. The transducers are designed for use in hazardous locations. Wide rangeability allows measurement of flow rate from 0.1 up to 394 ft/s (0.03 to 120 m/s). In contrast to thermal flowmeters, the ultrasonic transit-time technique does not depend on the heat transfer coefficient of the flare gas and does not require regular maintenance. These and other features make the DigitalFlow GF868 unique among flare gas flowmeters.

GF868 Specifications

Electronics

Flow Measurement

Patented Correlation Transit-Time mode

Enclosures

- Standard: Epoxy-coated aluminum weatherproof Type 4X/IP66 Class I, Division 2, Groups A,B,C&D FM and CSA
- Optional: Stainless steel, fiberglass, explosion-proof, flameproof

Dimensions

- Weight 11 lb (5 kg)
- Size (h x w x d) 14.24 in x 11.4 in x 5.12 in (362 mm x 290 mm x 130 mm)

Channels

- Standard: One channel
- Optional: Two channels (for two pipes or two-path averaging)

Display

Two independent software-configurable 64 x 128 pixel backlit LCD graphic displays

Keypad

39-key tactile-feedback membrane

Power Supplies

- Standard: 100 to 130 VAC, 50/60 Hz or 200 to 240 VAC, 50/60 Hz
- Optional: 12 to 28 VDC, $\pm 5\%$

Power Consumption

20W maximum

Operating Temperature

-4°F to 131°F (-20°C to 55°C)

Storage Temperature

-67°F to 167°F (-55°C to 75°C)

Standard Inputs

Two isolated 0/4 to 20 mA inputs (121 Ω) with integral 24 VDC power supply
Namur NE043 compliant

For required temperature and pressure inputs

Standard Outputs

- Six 4 to 20 mA outputs, software assignable
 - Two outputs with 550 Ω maximum load
 - Four outputs with 1000 Ω maximum load.
- Namur NE043 compliant

Optional Inputs/Outputs

There are four additional slots available for any combination of the following I/O boards:

- Analog output board with four isolated 0/4 to 20 mA outputs, 1 k Ω maximum load
- Analog input board; two types
 - With two isolated 4 to 20 mA inputs and 24V loop power
 - With two isolated, three-wire, 100 Ω RTD inputs; span -148°F to 662°F (-100°C to 350°C);
- Totalizer/frequency output board
 - With four outputs per board, 10-kHz maximum.
 - Software-selectable functioning in two modes
 - Totalizer mode: Pulse per defined unit of parameter (e.g., 1 pulse/ft³ or 1 pulse/0.028 m³)
 - Frequency mode: frequency proportional to rate of parameter (e.g., 10 Hz = 1 ft³/h or 0.028 m³/h)
- Alarm relay board with three hermetically sealed Form C relays; 120 VAC, 28 VDC maximum, 2A maximum; DC 56W maximum, AC 60 VA

Digital Interfaces

- Standard: RS232
- Optional: RS485 (multiuser)
- Optional: HART® protocol
- Optional: Modbus® RS485 or TCP/IP
- Optional: Ethernet TCP/IP
- Optional: OPC server
- Optional: Foundation Fieldbus
Namur NE107 Compliant

Site Parameter Programming

Menu-driven operator interface using keypad and "soft" function keys

Data Logging

Memory capacity (linear and/or circular type) to log more than 43,000 flow data points

Display Functions

- Graphic display shows flow in numerical or graphic format
- Displays logged data and diagnostics

European Compliance

Complies with EMC Directive 2004/108/EC, 2006/95/EC LVD (Installation Category II, Pollution Degree 2) and PED 97/23/EC for DN<25

T5/T17 Wetted Flow Ultrasonic Transducers

Temperature Ranges

Normal Temperature: -55°C to 150°C
Low Temperature (T5 Only): -220°C to -50°C
High Temperature: -50°C to 250°C

Pressure Range

Standard: -2 psig to 1500 psig (87.6 to 10300 kPa)

Transducer Materials

- Standard: Titanium
- Optional: Monel® or Hastelloy® alloys

Process Connections

Flanged and compression fittings

Area Classifications

Explosion-proof Div. 1, Class I, Group C, D
Optional: Group B upon request
ATEX II 2 G Ex d IIC T4, T3 or T2 Gb
IECEX II 2 G Ex d IIC T4, T3 or T2

Insertion Mechanism

Standard and Extended Range

3 in (76 mm) flange mounted packing gland and valve at equal mounting angle both up and downstream

Preamplifier

Transducer Mounted XAMP with transformer and BNC connections; requires one preamp/transformer per channel.

Gain

- Standard: 20
- Optional: 2, 10, 40 (factory selected)

Temperature Range:

-40°C to +60°C (-40°F to +140°F)

Enclosure

Explosion-proof Div. 1, Class I, Group C, D
Optional: Group B upon request
ATEX II 2 G Ex d IIC T6
IECEX II 2 G Ex d IIC T6

Transducer Cables

- Standard: (per pair of transducers)
 - One pair of coaxial cables, type RG62 A/U, preamplifier to XGF868i electronics, lengths 3 m (10 ft) to 330 m (1000 ft) maximum
- Optional: flame retardant, armored cable;

Additional Options

PanaView™ PC-Interface Software

The DigitalFlow GF868 communicates with a PC through a serial interface and Windows® operating systems. Features include site files, logs and other operations with a PC.

Installation Flowcells

Transducers and flowcells for specific applications are available. Consult GE for details

Flow Accuracy



T5 Transducer

T17 Transducer

Transducer Type	T5 Wetted Transducer				T17 Wetted Transducer			
Number of Paths	One Path		Two Paths		One Path		Two Paths	
Flow Measurement Range								
Standard Range	-328 to 328 ft/s (-100 to 100 m/s) - bidirectional							
Extended Range	.1 to 394 ft/s (0.03 to 120 m/s) - non-bidirectional							
Applicable Pipe Sizes								
Diagonal 45	3 in to 14 in (50 to 350 mm) OD				14 in to 120 in (350 to 3000 mm) OD			
Bias 90	Note 1 & 2				Not Applicable			
Design Velocity Accuracy from 1 to 394 ft/s (0.3 to 120 m/s) - see notes below								
Transducer Type	T5 Wetted Transducer				T17 Wetted Transducer			
Number of Paths	One Path		Two Paths		One Path		Two Paths	
	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)
Pipe Dia. <= 6 in. (150mm)	+2.5%	+2.0%	+2.0%	+1.5%	NA	NA	NA	NA
Pipe Dia. >= 6 in (150mm)	+2.0%	+2.0%	+1.5%	+1.5%	+2.0%	+2.0	+1.5%	+1.5%
Calibrated Velocity Accuracy from 1 to 394 ft/s (0.3 to 120 m/s) - see notes below								
Transducer Type	T5 Wetted Transducer				T17 Wetted Transducer			
Number of Paths	One Path		Two Paths		One Path		Two Paths	
	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)
Pipe Dia. <= 6 in. (150mm)	+1.5%	+1.0%	+1.0%	+0.75%	NA	NA	NA	NA
Pipe Dia. >= 6 in (150mm)	+1.0%	+1.0%	+0.75%	+0.75%	+1.0%	+1.0%	+0.75%	+0.75%
Mass Flow Accuracy								
2 to 120 kg	+4.0%		+3.1%		+2.7%		+2.3%	
Molecular Weight Accuracy								
2 to 120 kg/kmole	+1.8% to +2%							
Flow Velocity Sensitivity from .1 to 1 ft/s (0.03 to .3 m/s)								
Pipe Dia. = 10 in. (250mm)	±0.12 in/s(±0.004 m/s)		±0.08 in/s(±0.003 m/s)		NA		NA	
Pipe Dia. = 14 in. (250mm)	±0.12 in/s(±0.004 m/s)		±0.08 in/s(±0.003 m/s)		±0.08 in/s(±0.003 m/s)		±0.06 in/s(±0.002 m/s)	
Pipe Dia. >= 20 in. (500mm)	±0.12 in/s(±0.004 m/s)		±0.08 in/s(±0.003 m/s)		±0.06 in/s(±0.002 m/s)		±0.04 in/s(±0.0015 m/s)	
Note 1	Accuracy and sensitivity are dependent on pipe diameter, molecular weight and temperature. All accuracy specs assume molecular weights greater than 24 kg/kmole and temperatures less than 100 °F (38 °C)							
Note 2	Accuracy is dependent on straight run. All accuracy specs assume a fully developed flow profile or a minimum straight run of 20D upstream and 10D downstream							
Note 3	Stated accuracy may be achieved with total straight run as little as 10D/3D using flow profile correction - contact factory for details							



GLOBAL LEADER IN EMISSIONS CONTROL SOLUTIONS

EMISSION GUARANTEE

Provided by: William Casolara

January 12, 2016

Confidential

Emergency Generator Specification



Global Leader in Emission Control Solutions

January 12, 2016

Val Jensen
Valley Power

RE: oilfield standby genset

Mr. Jensen,

I am pleased to provide this emission guarantee based on the following information. If you have any questions or concerns please feel free to contact myself or any of my associates at DCL America.

Also, this guarantee is subject to DCL's standard terms and conditions of sale attached. Copies of the limited warranty statement are available from DCL upon request (DCL doc. No. X0010-0000-68).

Best Regards,

Will Casolara
Senior Sales Engineer
DCL America Inc.

Cell: 760.898.6972
wcasolara@dcl-inc.com



EMISSION GUARANTEE

ENGINE DATA

Engine Model	Guascor SFGRD 480
Power	1126 bhp @ 1800 rpm (100% load)
Fuel	PQNG
Exhaust Flow Rate	6830 lb/hr
Exhaust Temperature	1202° F

CATALYST DATA

Catalyst Model	2-DC74.5-12 CC
Type	NSCR
# of Elements	2
Cell Density	300 cpsi
Approx. Dimensions	27.25" x 3.75"
Approx. Backpressure	5.2" w.c.

EMISSION REQUIREMENTS

Exhaust Component	Engine Output (g/bhp-hr)	Converter Output	Converter Output (% Reduction)
NOx	11.2	5 ppmvd @ 15% O ₂	
CO	8.0	0.209 g/bhp-hr	
VOC	0.4	0.048 g/bhp-hr	>80



The catalyst model selection is based upon the reduction requirements above. Any variance in these requirements may affect the price and model required.



STANDARD TERMS AND CONDITIONS OF SALE – Revised January 2015

1. **Application.** These Standard Terms and Conditions apply to any sale of products, equipment, parts, materials and related services (the “**Products**”) by DCL America Inc. (“**DCL**”) to a DCL customer (the “**Customer**”) and acceptance of these Standard Terms and Conditions is an express condition of such a sale.
2. **Entire Agreement.** These Standard Terms and Conditions, the quotation (the “**DCL Quotation**”) and/or order confirmation (the “**DCL Order Confirmation**”) issued by DCL in respect of each supply of Products and any other document expressly incorporated by reference by DCL in a DCL Order Confirmation (collectively, the “**Agreement**”) constitute the entire agreement between DCL and the Customer regarding a sale of Products by DCL to the Customer and supersede all other discussions, proposals, negotiations, statements, representations, understandings and the like, whether written or oral. DCL rejects any differing or supplemental terms which may be printed or otherwise found in any purchase order or other document sent by the Customer, except as expressly accepted by DCL by the signature of an authorized representative. Unless otherwise specifically and expressly set forth in writing by a duly authorized representative of DCL, if there are inconsistencies in the documents constituting the Agreement, such documents shall take precedence in the following order: (i) these Standard Terms and Conditions, (ii) the DCL Order Confirmation, and (iii) the DCL Quotation or other contract document incorporated by reference by DCL in the DCL Order Confirmation. For purposes hereof, an “**Affiliate**” of DCL includes any entity directly or indirectly controlling, controlled by or under common control with DCL, where “control” of an entity means direct or indirect beneficial ownership of securities representing 20% or more of the votes attached to all outstanding securities of such entity.
3. **Terms of Payment.** Unless otherwise agreed by DCL in writing, DCL invoices for the Customer’s purchase of Products are payable within thirty (30) days of the date of the invoice. Should payment of any amount owing to DCL under the Agreement not be made to DCL when due, such payment shall bear interest at the rate of one and one-half percent (1½%) per month or the maximum rate allowed by law, whichever is lower. The charging of such interest shall not be construed as obligating DCL to grant any extension of time in the terms of payment. No cash discount shall be available to the Customer. If prior to any delivery of Products, DCL has concern regarding timely payment of the purchase price because of a material adverse change in Customer’s circumstances or otherwise, DCL may require payment of all or additional parts of the purchase price before shipment or delivery and/or DCL may require satisfactory security for the payment of the purchase price.
4. **Delivery Terms.** Each sale of Products shall be shipped in accordance with the Incoterms 2000 specified in the DCL Quotation or DCL Order Confirmation. If shipping instructions are not so specified for any supply of Products, such supply shall be shipped ex works (Incoterms 2000). Ex works deliveries of the Products are deemed complete upon release of the Products to the Customer’s carrier at the applicable manufacturing facilities located in Concord, Ontario, Canada as specified by DCL in the DCL Quotation, the DCL Order Confirmation, or otherwise. If the Customer is unable or unwilling to accept physical delivery at the time specified, DCL may store or arrange for storage of Products at Customer’s cost and the delivery of such Products shall be deemed complete as of the first day of storage.
5. **Taxes.** Unless otherwise expressly provided by DCL in a DCL Quotation or DCL Order Confirmation, or otherwise implicit in the Incoterms 2000 specified for a particular supply, the price of the Products shall not include sales, use, excise, value added or any similar taxes, duties and other export/import charges, any inspection or testing fees or any other tax, fee, penalty or charge of any nature whatsoever imposed currently or in the future by any federal, state or other government authority, upon or with respect to the sale, purchase, delivery, storage, processing or use of any Product or upon payment to DCL, and all such taxes, fees and other charges shall be paid by Customer in addition to the price of the Products. In the event DCL is required to pay any such taxes, fees or other charge, Customer shall reimburse DCL therefor.
6. **Delivery Schedule.** Time for delivery of Products is approximate and starts to run on the latest of the date specified or confirmed in the DCL Order Confirmation, or the receipt by DCL of any advance payment, credit approval or any security for the balance of the purchase price, as applicable, each as may be requested by DCL. Unless otherwise specified or confirmed in a DCL Order Confirmation, DCL shall not be liable for losses of any kind incurred by the Customer for delays in or failure to deliver all or any part of the Products. Changes in the delivery schedules requested by the Customer must be in writing and received by DCL at least two (2) business days prior to the previously scheduled shipping date. DCL is under no obligation to accept any changes in delivery dates requested by the Customer.
7. **Title Retention.** Title or ownership of the Products shall not pass to the Customer, notwithstanding delivery thereof, but shall remain vested in DCL until the purchase price of the Products is paid in full. As security for the full payment of the purchase price of the Products, the Customer hereby grants to DCL, and DCL hereby reserves, a purchase money security interest and charge in the Products and in all substitutions, replacements and additions thereto and the proceeds thereof. Until such time of full payment, the Customer shall: (a) insure the Products against loss, damage or destruction for full replacement value; and (b) execute such additional documents as DCL requests for the confirmation or perfection of DCL’s ownership or security interest and charge. Upon default by the Customer, and subject to applicable law, DCL may repossess and deal with the Products as it sees fit and retain all payments which have been made by the Customer on account of the purchase price as partial damages. Upon any such realization of security, the Customer shall remain liable for any deficiency in the purchase price and shall reimburse DCL for all costs and expenses, including reasonable legal fees, incurred in enforcing its rights. All rights and remedies of DCL are cumulative and in addition to those available at law or in equity.
8. **DCL Property.** All supplies, materials, tools, jigs, dyes, gauges, fixtures, molds, patterns, equipment and other items procured by DCL to perform the supply of Products under any Agreement shall be and shall remain the property of DCL under all circumstances, including, without limitation, reimbursement of DCL by the Customer for all or any portion of the cost of such items.
9. **Risk of Loss.** Unless otherwise specified or confirmed in the DCL Order Confirmation, the risk of loss or damage to the Products including any repaired or replaced items, and the responsibility for the payment of insurance premiums and freight passes to the Customer upon DCL’s delivery of such Products to the Customer’s carrier as provided in Section 4. No loss or damage to the Products or any portion thereof shall relieve the Customer from its obligations hereunder.
10. **Suitability.** Before using any Product, Customer shall determine the suitability of such Product for Customer’s intended use. Customer shall assume all risk and liability whatsoever resulting from the use of the Products.
11. **Limited Warranties.** DCL warrants that each Product is free of defects in material and workmanship strictly in accordance with the terms and conditions of the limited warranty statement specified or confirmed in the applicable DCL Quotation or DCL Order Confirmation at the time of purchase (the “**Product Warranties**”). Additional copies of Product Warranties are available from DCL upon request.
12. **No Other Warranties.** THE LIMITED PRODUCT WARRANTIES REFERRED TO IN SECTION 11 ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES OR CONDITIONS IN RESPECT OF THE PRODUCTS, INCLUDING, WITHOUT LIMITATION, ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE OR INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OR ANY OTHER WARRANTIES ARISING BY OPERATION OF LAW, COURSE OF DEALING, TRADE USAGE, REPRESENTATION, STATEMENT OR OTHERWISE. THE REMEDIES PROVIDED IN THE

DCL America Inc. 27603 Commerce Oaks Drive, Oak Ridge North, TX 77385

Toll free: 1-877-965-8989 Fax: 281-605-5858 Email: info@dcl-inc.com www.dcl-inc.com



APPLICABLE PRODUCT WARRANTY ARE THE CUSTOMER'S SOLE REMEDIES FOR ANY FAILURE OF DCL TO COMPLY WITH ITS WARRANTY OBLIGATIONS. Applicable law may not allow exclusions of implied warranties, so the above exclusions may not apply.

13. **Limitation of Liability.** NEITHER DCL NOR ITS AFFILIATES SHALL UNDER ANY CIRCUMSTANCE BE LIABLE TO ANYONE FOR DIRECT, INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, ANY LOST PROFITS AND LOST SAVINGS, HOWEVER CAUSED, WHETHER FOR BREACH OR REPUDIATION OF CONTRACT, TORT, BREACH OF WARRANTY, NEGLIGENCE, OR OTHERWISE, WHETHER OR NOT DCL WAS ADVISED OF THE POSSIBILITY OF SUCH LOSSES OR DAMAGES. IN NO EVENT SHALL DCL BE LIABLE FOR THE COST OF PROCUREMENT OF SUBSTITUTE PRODUCTS. DCL'S MAXIMUM TOTAL CUMULATIVE LIABILITY FOR ANY REASON SHALL NOT EXCEED THE AGGREGATE PURCHASE PRICE FOR THE APPLICABLE PRODUCTS SUPPLIED UNDER THE AGREEMENT. THE FOREGOING LIMITATION OF LIABILITY SHALL APPLY TO THE FULLEST EXTENT PERMITTED BY LAW IN THE APPLICABLE JURISDICTION. CUSTOMER HAS ACCEPTED THE DISCLAIMER OF WARRANTIES IN SECTION 11 AND LIMITATION OF LIABILITY IN THIS SECTION 13 AS PART OF A BARGAIN WITH RESPECT TO THE PRICING OF THE PRODUCTS AND UNDERSTANDS THAT THE PRICING WOULD BE HIGHER IF DCL WERE REQUIRED TO BEAR LIABILITY IN EXCESS OF THAT STATED HEREIN. DCL neither assumes nor authorizes any person, firm or entity to assume for DCL any other additional liability or responsibility in connection with the Products, including any affirmation, representation, or warranty concerning the Products made by an agent, employee, or representative of DCL.
14. **Indemnification.** Customer shall defend, indemnify and hold harmless DCL and its Affiliates and their respective officers, directors, agents, employees, successors, assigns and other customers (collectively, the "**Indemnified Parties**") against any and all claims, demands, actions, suits, proceedings, damages, obligations, losses, liabilities and expenses (including all legal fees) and judgments of any nature whatsoever arising from or in connection with (a) the use, operation, storage, sale, processing, or other disposition of the Products sold to such Customer under the Agreement, or the action or inaction of Customer or, if applicable, its employees, customers, or agents, which may cause injuries or damage, and (b) any alleged intellectual property infringement arising out of Customer's use of the Products or incorporation of the Product(s) as components into any other product. DCL shall hold the benefit of this indemnity in trust for the Indemnified Parties other than DCL, who shall be entitled to enforce this indemnity to the same extent as if they were parties hereto.
15. **Intellectual Property.** Neither Customer, nor its affiliates (nor their respective successors, assigns, licensees or other transferees) shall enforce (or attempt or purport to enforce) against DCL or its affiliates, (sub)licensees, manufacturers, and distributors any existing or future patent that claims (or purports to claim) any or part of the Products or the use, design, manufacturing, layout and packaging thereof. This nonassertion covenant shall be a covenant that transfers with any sale, license or other disposition or grant of rights under the applicable patent rights.
16. **Re-sale of Products.** Without limiting the generality of anything set forth in the Agreement, in respect of any re-sale of the Products or sale of any product which incorporates a Product as a component, the Customer shall indemnify, defend and hold harmless DCL, its officers, directors, agents, employees, successors, assigns and other customers against any and all claims, actions, losses, liabilities and expenses (including all legal fees) or judgments arising from or in connection with a representation or warranty for the Products, including in their capacity or use as a component part of other products, made by the Customer, other than as limited by the applicable Product Warranties, or arising from an allegation of patent infringement relating to Customer's product(s) in which the Products are used as a component part.
17. **Survival.** All payment obligations, provisions for the limitation of or protection against liability of DCL and any other provision of an Agreement which by its nature are continuing shall survive the termination, cancellation or expiration of such Agreement.
18. **Permits.** The Customer shall obtain at its expense all licences, permits and approvals for the purchase, delivery, shipment, installation and use of any Products.
19. **Force Majeure.** DCL is excused from the timely performance of its obligations in the sale or other supply of Products if its performance is impeded or prevented by circumstances beyond its control (a "**Force Majeure Event**") and DCL is taking all reasonable steps to mitigate the effect of the delay. Following the occurrence and the termination of a Force Majeure Event, DCL shall provide the Customer with written notice and reasonable particulars of the Force Majeure Event. Either party may terminate any Agreement affected by a Force Majeure Event if such circumstances continue for more than six (6) months. Upon and notwithstanding any such termination, the Customer shall pay DCL for that portion of the Products manufactured or delivered prior to the date of the abovementioned initial notice of the Force Majeure Event. Notwithstanding anything in this Section 19, the Customer shall extend any security granted for the payment of the purchase price of Products for a period equal to the delay caused by the Force Majeure Event.
20. **Governing Law.** The sale of the Products and this Agreement are governed by the laws of Delaware and the laws of United States applicable therein. Each of the parties irrevocably attorns to the exclusive jurisdiction of the courts of Delaware, provided that DCL shall not be prevented from seeking injunctions or other temporary relief or enforcing judgments of the courts of Delaware in another jurisdiction. The United Nations Convention on the International Sale of Goods is explicitly excluded from this Agreement.
21. **Confidential Information.** Customer shall not disclose proprietary or confidential business or technical information disclosed by DCL or related to any Products to any third parties and shall not use such information for its own benefit or for any purpose other than for the express purpose for which it was disclosed as set forth in writing by DCL at the time of disclosure.
22. **Assignment.** Customer may not assign all or any part of the Agreement for sale of Products without the prior consent of DCL. Any attempt at assignment shall be null and void unless made in conformity with this Section 22.
23. **Waiver, Amendment.** Any waiver, modification or amendment of the Agreement shall only be effective as against DCL if such waiver, modification or amendment is contained in a written instrument prepared or otherwise accepted in writing by DCL. A waiver or modification by DCL of any condition or obligation of Customer hereunder shall not be construed as a waiver or modification of any other condition or obligation and no waiver or modification by DCL granted on any one occasion shall be construed as applying to any other occasion.
24. **Suspension or Cancellation.** Subject to Section 19 hereof, no Agreement may be cancelled or suspended by the Customer without the express written consent of DCL, such consent to be granted in DCL's sole and unrestricted discretion and upon such terms, including the payment of all costs incurred and profits foregone, as DCL may require.
25. **Severability.** If a binding court determination is made that a provision of these Standard Terms and Conditions or any other document which forms the Agreement is unenforceable (in whole or in part), then such provision shall be void only to the extent that such determination requires, and the parties shall replace such void provision with one that is enforceable and valid and, to the greatest extent permitted by law, serves the intent and purpose of the void provision. No other provision shall be affected as a result thereof, and, accordingly, the remaining provisions shall remain in full force and effect as though such void, voidable or inoperative provision had not been contained herein.

 Guascor Engines & Gensets	GROUP	GAS	PRODUCT INFORMATION	INDEX
	IC		OF-G-48-060	A1
	POWER RATING			DATE
			01-12-16	
			DEP.	2

GENSET:	SFGRD 480	SPEED:	1800
JACKET WATER TEMPERATURE(°F):	194	FUEL TYPE:	NATURAL GAS
INTERCOOLER WATER TEMP(°F):	131		

APPLICATION:	EMERGENCY (ESP)	COMPRESSION RATIO:	9,2:1
COOLING SYSTEM:	TWO CIRCUITS	REGULATION:	Electronic
EXHAUST MANIFOLD TYPE:	TWO STAGE IC	IGNITION TIMING:	16°
EMISSIONS:	WATER COOLED	MAX. BACK PRESSURE:	18 "H ₂ O (450 mmH ₂ O)
	NOX g/bHP(11)	AMBIENT CONDITIONS ISO 3046/1:	
	CO g/bHP(11)	Atmospheric pressure ("Hg (kPa))=	30 (100)
	NMHC g/bHP(11)	Ambient temperature (°F (°C))=	77 (25)
		Relative humidity (%)=	30

POWER RATING (4)			NOMINAL	PARTIAL LOADS		
LOAD		%	100%	80%	60%	40%
MECHANICAL POWER	(3, 4, 5)	BHP (KWb)	1126 (840)	901 (672)	676 (504)	451 (336)
BMEP		psi (bar)	170 (11,7)	135 (9,3)	102 (7,0)	68 (4,7)
ELECTRICAL POWER (cosφ 1)		kWe	809	646	481	316
ELECTRICAL POWER (cosφ 0,8)		kWe	801	640	478	314
FUEL CONSUMPTION	(1)	BTU/bHP-hr (KW)	7600 (2508)	7900 (2086)	8490 (1682)	9541 (1261)
MECHANICAL EFFICIENCY		%	33,5	32,2	30,0	26,6
ELECTRICAL EFFICIENCY (cosφ 1)		%	32,3	31,0	28,6	25,1
HEAT IN MAIN WATER CIRCUIT	(1)	BTU/min (KW)	47710 (839)	40550 (713)	34630 (609)	27980 (492)
HEAT IN SECONDARY WATER CIRCUIT	(1)	BTU/min (KW)	6199 (109)	5858 (103)	5289 (93)	4663 (82)
HEAT IN CHARGE COOLER	(1)	BTU/min (KW)	1990 (35)	1763 (31)	1479 (26)	1137 (20)
HEAT IN OIL COOLER	(1)	BTU/min (KW)	4208 (74)	4095 (72)	3810 (67)	3526 (62)
HEAT IN EXHAUST GASES (25 °C)	(1)	BTU/min (KW)	39070 (687)	32240 (567)	25420 (447)	18540 (326)
HEAT IN EXHAUST GASES (120°C)	(1)	BTU/min (KW)	33140 (583)	27290 (480)	21460 (377)	15570 (274)
EXHAUST GAS TEMPERATURE	(1)	°F (°C)	1202 (650)	1193 (645)	1170 (632)	1139 (615)
HEAT TO RADIATION	(1)	BTU/min (KW)	1877 (33)	1763 (31)	1649 (29)	1422 (25)
CARBURETION SETTINGS (2)						
O ₂ TO EXHAUST(DRY)(ONLY A REFERENCE)		%	0,2	0,2	0,2	0,2

MASS FLOWS						
INTAKE AIR FLOW	(1)	lb/h (Kg/h)	6430 (2920)	5340 (2420)	4310 (1960)	3230 (1460)
EXHAUST GAS FLOW (WET)	(1)	lb/h (Kg/h)	6830 (3100)	5680 (2580)	4580 (2080)	3440 (1560)

NOTES:
1. 100% LOAD TOLERANCES: FUEL CONSUMPTION +5%, COOLING CIRCUIT AND EXHAUST GASES ± 8%, RADIATION ±25% EXHAUST TEMPERATURE ±36°F (20°C), MASS FLOWS ± 10%.
2. THE ENGINE PERFORMANCE DATA, TIMING ADVANCE AND CARBURETION SETTINGS ARE VALID FOR A GAS THAT FULFILS THE REQUIREMENTS DEFINED IN IC-G-D-30-001e AND IC-G-D-30-002e
3. POWER INCLUDES MECHANICAL PUMPS. POWER RATING ACCORDING TO ISO 8528-1.
4. POWERS ARE VALID FOR AMBIENT TEMP.=104 °F (40 °C) AND AN ALTITUDE OF =6562 ft (2000 m). SEE OTHER CONDITIONS IN PI IC-G-B-00-001
5. OVERLOAD NOT ALLOWED
6. THE SPECIFICATIONS AND MATERIALS ARE SUBJECT TO CHANGE WITHOUT NOTIFICATION
7. A ENGINE WITH INLET OR OUTPUT RESTRICTION OVER PUBLISHED LIMITS, OR WITH INADEQUATE MAINTENANCE OR INSTALLATION CAN MODIFY POWER RATING DATA.
8. EMISSIONS ACCORDING TO D1 CYCLE IS 8178-4.
9. ALTERNATOR VOLTAGE 440 V
10. STAND-BY MEANS AN AVERAGE LOAD OF 85% IN 24 HOURS WITH AN ANNUAL OPERATION LIMITATION OF 400 HOURS
11. 3 WAYS CATALYST NO CONSIDERED IN EXHAUST.
12. RUNNING CHECKS ARE REQUIRED MONTHLY, AT LESAST AT 40% LOAD, ACCORDING TO IO-G-M-00-064e

CODE3	12/01/2016	Cod.: C-A	Elab:	dev	Versión: 32/18/11/2015	1/1
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DRESSER-RAND.

Guascor Engines & Gensets

PRODUCT INFORMATION

IC-G-D-00-132e

INDEX

A

DATE

March 2015

Dep. 2

**TECHNICAL CHARACTERISTICS "V"
RICH BURN GAS ENGINES**

ITEM	UNITS	SFGRD 360	SFGRD 480	SFGRD 560
N° of Cylinders		12	16	
Cycle		4 strokes per cycle		
Cylinder Bore X Stroke	mm / (in)	152 x 165 / (5.98 x 6.50)		160 x 175 / (6.30 x 6.90)
Displacement	L / (In ³)	35,93 / (2193)	47,90 / (2923)	56,30 / (3436)
Compression Ratio		9,2:1		
Firing Order		1-8-5-10-3-7-6-11-2-9-4-12	1-12-4-10-2-14-6-16-8-13-5-15-7-11-3-9	
Rotation as viewed from the Flywheel end		Counter-clockwise		
Flywheel Housing / Flywheel		SAE 00 / 18"		
Valve Set	Intake: mm /(in) Exh.: mm /(in)	0.3 / (0.012) 0.8 / (0.031)		
Engine Weight	Kg / (Lb)	4115-4200 / (9072-9259)	5360-5450 / (11816-12015)	5800 / (12787)
General Dimensions	W mm / (in)	1664 / (65.51)	1664 / (65.51)	1669 / (65.71)
	L mm / (in)	2796 / (110.08)	3033 / (119.41)	3033 / (119.41)
	H mm / (in)	2258 / (88.90)	2278 / (89.69)	2270 / (89.37)

COOLING SYSTEM

Types		Water-Water or Water-Air		
Main Circuit capacity	L / (gal)	180 / (47.6)	200 / (52.8)	
Standard Jacket Water Temp.	°C / (°F) min-std	75-90 / (167-194)		75-90 / (167-194)
High Jacket Water Temp.	°C / (°F) max	96 / (205)		96 / (205)
Auxiliary Water Temp.	°C / °F	/55 /(131)		/40 /(104)

LUBRICATION SYSTEM

Oil type	Natural Gas	GUASCOR MOTOROIL 3040 Plus See IC-G-D-25-003		
Normal Oil Pressure	Bar / (psi)	4 – 6 / (58-87)		
Oil Temperature (min/max)	°C / °F	80 –95 / (176-203)		
Oil capacity (max)	L / (gal)	174 / (46)	233 / (61.5)	272 / (71.9)
Approximate oil consumption	gr/kWh / (gr/hphr)	0.35 / (0.26)		0.20 / (0.15)



PRODUCT INFORMATION
IC-G-D-00-132e

INDEX
A

DATE
<i>March 2015</i>

<i>Dep. 2</i>

TECHNICAL CHARACTERISTICS “V” RICH BURN GAS ENGINES
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COMBUSTION SYSTEM			
Type of Combustion		Rich burn (Lambda ≈ 0.98)	
Regulation		SFGRD: Electronic mixture regulation	
Fuel Gases		Natural Gas *	Natural Gas **
Gas regulation valve		With Zero Pressure Regulator	

* Natural gas of methane number >75

** Natural gas of methane number >80

Miscellaneous Equipment

TODO[®]

A Gardner Denver Product

TODO-MATIC[®] DRY-BREAK[®] COUPLINGS



We are proud to present the TODO-MATIC[®] range of DRY-BREAK[®] couplings. More than 30 years of expertise has gone into their design and manufacture.

In sizes from 1" to 6" and a wide range of material options, TODO-MATIC[®] DRY-BREAK[®] couplings offer advanced fluid handling solutions for a diverse range of industries.

Major offshore exploration, chemical, pharmaceutical and petro chemical companies rely on TODO-MATIC[®] couplings to safely transfer their most aggressive or valuable products.

Designed for safe and easy use with minimum operator intervention. TODO-MATIC[®] couplings offer an unbeatable combination of technical, safety and performance features.

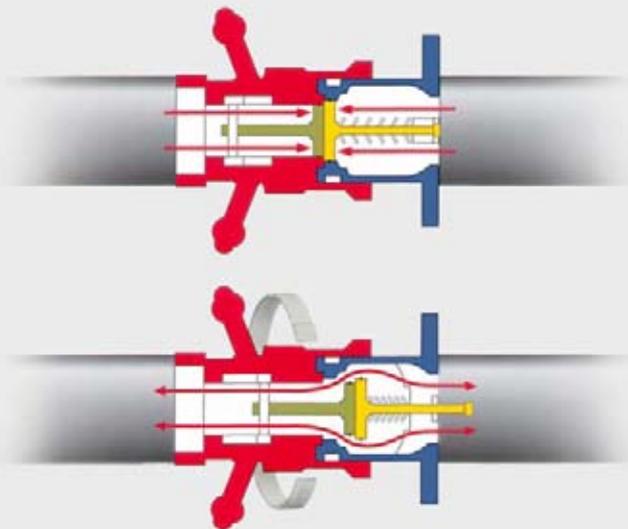


FEATURES

- Valves open and close automatically on connection and disconnection.
- Simple single action operation, no levers or switches to operate.
- Valves are guaranteed closed prior to disconnection.
- Minimal residual loss on disconnection (e.g. maximum 0.35cc for 2" DN50).
- Will connect and disconnect under pressure and flow where necessary.
- Extremely reliable, very few moving parts.
- Robust construction, no external operational components.
- Available with selectivity system to prevent cross contamination.
- Reduces spillages to virtually zero.
- Dramatically improves both operational and fugitive emission performance.
- Reduces the possibility of human error in transfer operations.
- Improves efficiency.

HOW IT WORKS

Turning the hose unit 15° clockwise locks the units together. The valves are still closed and are not opened until a further rotation of 90° has been performed and then the product flow is guaranteed. To close the valve and to unlock the units, reverse the procedure.





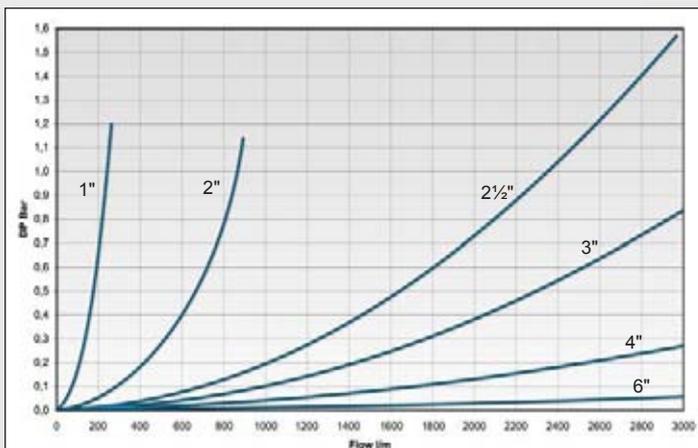
TECHNICAL DETAILS

Sizes:	1" (DN19 - DN32) to 6" (DN150).
Materials:	Aluminium, gunmetal and stainless steel 316L, other on request.
Seals:	FKM (Viton®), NBR (Nitrile), EPDM, Chemraz®, Kalrez®. Other materials on request.
Working pressure:	PN 10 - PN 25.
Test pressure:	Working pressure +50%.
Safety factor:	5:1.
End connections:	BSP- and NPT-threads. DIN-, ASA-, TW- and TTMA-flanges (available for both tank and hose units). Other threads and flanges on request.
Compatibility:	NATO STANAG 3756. Viton® and Kalrez® is registered trademarks of DuPont Performance Elastomers. Chemraz® is a registered trademark of Green-Tweed.

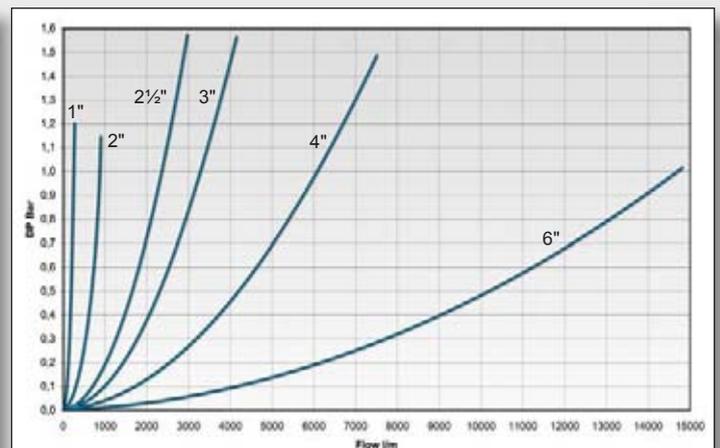
FLOW CAPACITY

TODO-MATIC® DRY-BREAK® couplings offer high flow capacity

Media: water. Temperature: 20°C.



Pressure drop for 1" to 6", scale 0-3000 l/min.



Pressure drop for 1" to 6", scale 0-15000 l/min.

CERTIFICATES / APPROVALS

TODO-MATIC® couplings carry the highest level of certification and approvals available. VdTÜV under test approval mark TÜ.AGG.162-93 towards ADR, RID, IMDG and TA-Luft classifications. European directives 97/23/EC (PED) and 94/9/EC (ATEX) compliant. Manufactured under EN ISO 9001:2000.



TODO-MATIC® SIZE RANGE



1" TODO-MATIC® (DN19 - DN32, Ø56 mm)

TODO-MATIC® DRY-BREAK® couplings in 1" size are designed for smaller bore applications where compact dimensions are required. One handed operation, high flow rate and minimal release on disconnection make TODO-MATIC® perfect for transferring high value or sensitive medias with confidence. The addition of selectivity to prevent product cross contamination expands the operational possibilities in manifold exchange applications.



2" TODO-MATIC® (DN40 - DN50, Ø70 mm)

Our 2" coupling size probably covers the most diverse selection of applications in the TODO-MATIC® family. Available in a range of material and connection configurations, TODO-MATIC® 2" is designed for rapid and safe transfers. Offshore chemical dosing, Pharmaceutical feedstock and aggressive chemical vapour transfer are just some of the challenging applications TODO-MATIC® couplings see on a daily basis.



2½" TODO-MATIC® (DN65 - DN80, Ø105 mm)

The 2½" TODO-MATIC® coupling is generally used in road tanker and aviation applications transferring a variety of liquids and vapours. Just like all TODO-MATIC® couplings, the 2½" is available in a full range of materials to offer compatibility with most applications. A strong integral swivel, ergonomic design and rugged construction ensure TODO-MATIC® couplings are equipped for the real world.



3" TODO-MATIC® (DN80, Ø119 mm)

A true 3" coupling, similar in size to the 2½" but with greater flow. Typically used for road and rail tank loading / discharge, in plant chemical transfers etc. Tough construction, ease of handling, no spillage and high flow made this coupling form the natural choice for N.A.T.O refuelling standardisation.



4" TODO-MATIC® (DN100, Ø164 mm)

Without exception, the most compact, light weight, high flow 4" self sealing coupling system available. Used extensively for offshore ship to rig transfers of fuels and drinking water, aviation fuel bunkering, rail tank loading / discharge, chemicals etc.

Rapid, positive connection and disconnection make TODO-MATIC® the standard for barge to ferry re-fueling and multiple rail tank discharge.



6" TODO-MATIC® (DN150, Ø238 mm)

The same features and method of operation as the rest of the range make 6" TODO-MATIC® the ideal ship / barge to shore connection.

Much faster and safer than any flange coupling means not only environmental standards compliance but real turn around time savings. Full marine construction with rotating lifting loop as standard.

As with all TODO-MATIC® couplings, the 6" is equally suitable for flexible hose or loading arm applications.



Hose unit with flange

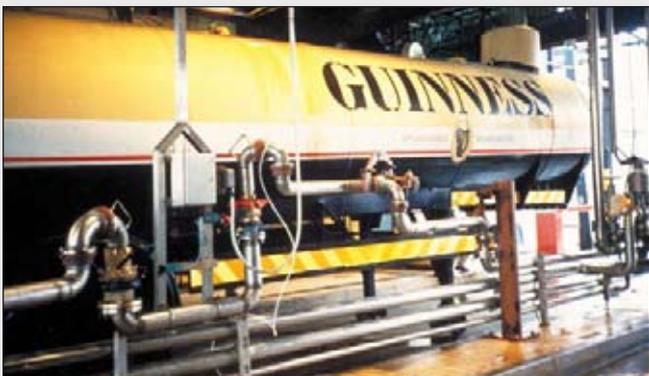
All sizes of the hose unit are also available with flange.



APPLICATIONS

- Road / Rail tanker loading / discharge
- ISO retrofit & new build
- IBC containers
- Offshore rig supply
- Pharmaceutical processing
- Vapour Recovery
- Ship to shore / ship / rig transfer
- Ship manifold exchange
- Bulk loading / discharge
- Paints & inks
- Marine refuelling
- Bitumen transfer
- Brewery
- Food feedstock
- Hazardous waste transfer
- Aviation bunkering
- Exchange manifolds
- Blending pits
- Rail locomotive refuelling
- Tank top / bottom loading
- etc..







SAFETY PRESSURE TIGHT CAP

Designed to enhance operator safety & containment security in chemical & gas transport. Pressure indicator, depressurization, customs / tamper seal feature, automatic locking, certified closure. Manually lockable (with padlock). WP: PN 25. Sizes: 2" - 4".



DUST PLUGS AND DUST CAPS

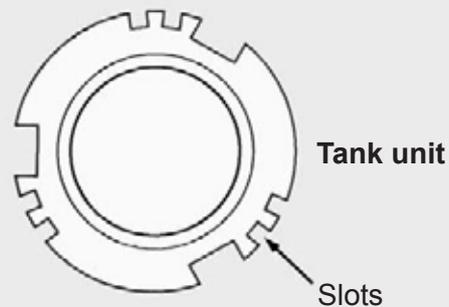
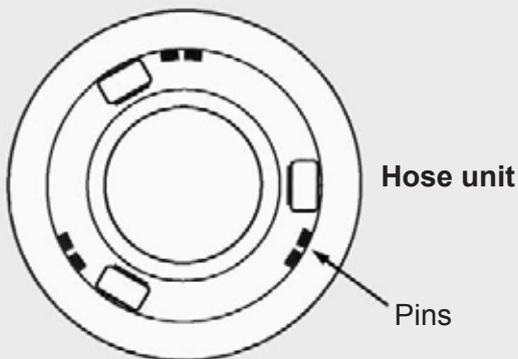
Available in stainless steel, brass / gunmetal and aluminium. There are also versions available in rubber. Dust plugs / caps should be used to prevent ingress of dirt or water. Sizes: 1" - 6".





SELECTIVITY

To avoid cross contamination by connecting a hose unit to the wrong tank unit. Each unit has a number of selective positions, designated by a coded part number according to the coupling size.



SPECIALS / ACCESSORIES



Pressure relief valve, for tank unit

Dissipates trapped fluid pressure into hose unit without spillage, to allow easy connection.



TOD0 4WD

Developed specially for the use of aggressive chemicals and uses a new patented valve mechanism. Easier to connect / disconnect. Less seal wear due to the use of advanced seating and coating technologies. Less total loss of fluid on disconnection. WP: PN 25.



SPECIALS / ACCESSORIES



TODO-MATIC® for extremely corrosive media
Available in Hastelloy, other materials on request.



Tools for draining of hose and tank units



Hose unit with magnetic switch
The switch indicates if the hose unit is fully connected to a standard tank unit. Can be used to start pumps, activation of brakes on road tankers, etc.



Parking device
For safe and convenient storing of hose units.



1" foldable handle



2" foldable handle mounted on the swivel



2" round handle



2½"-3" straight handle



4" round handle



TODO® is the world's leading manufacturer of DRY-BREAK® couplings

TODO® was established as a family concern in 1971 based in Töreboda, Sweden. In 2006 TODO® was acquired by Gardner Denver International and now form part of the companies Fluid Transfer Division. With 35 years of experience in the fluid handling industry TODO® is now established as the world's leading manufacturer of DRY-BREAK® couplings. These couplings are supplied globally into a diverse range of industrial applications for the transfer of oil, gases, chemicals etc.

TODO-MATIC® DRY-BREAK® couplings provide easy, quick, safe and environmentally friendly handling of liquids and gases. They minimise risk of operator exposure to emissions, provide better ergonomics, reduce human error and achieve commercial benefits through time saving / clean up costs.

TODO® design and manufacture to EN ISO 9001:2000 accredited quality procedures and provide a product range that conforms to all relevant international quality, performance and safety standards. TODO-MATIC® couplings carry the highest level of certification and approvals available.

PRODUCT RANGE



TODO-MATIC®



TODO-GAS®



TODO® Safety Break Away



TODO-45 aviation



PTC (Pressure Tight Cap)



Ball Valves



Fuel Nozzles



API couplings



Swivels

Fluid Throughput Measurement

Fluid Throughput Measurement of Storage Tanks

Aera will maintain records of fluid production, flows, injection and sales. The fluid throughput of storage tanks will be tracked and recorded. Tracking of flow through each tank will either be made directly by flow meter measurement or by delivery ticket. Throughput records will conform with applicable rules and regulations.

Project planned monitoring of tank fluid throughput is summarized below:

Equipment Tag Number	Description Long	Throughput Measurement Method	Description	Calculation Method (if applicable)
T-2040	Light Oil Storage Tank	Flow Meter	LACT flow meter at truck unloading station	Direct reading from meter
T-2050	Light Oil Storage Tank	Flow Meter	LACT flow meter at truck unloading station	Direct reading from meter
T-2170	Stock Oil Storage/ Reject Tank	Flow Meter	LACT flow meter at truck loading station	Direct reading from meter
T-2180	Stock Oil Storage/ Reject Tank	Flow Meter	LACT flow meter at truck loading station	Direct reading from meter
T-3030	Clarifier Tank	Flow Meter	Flow meter at inlet of Clarifier T-3030	Direct reading from meter
T-3130	Clarifier Tank	Flow Meter	Flow meter at inlet of Clarifier T-3130	Direct reading from meter
T-3200	Filter Feed Tank	Flow Meter	Flow meter at inlet of Clarifier T-3030	Direct reading from meter
T-3300	Filter Feed Tank	Flow Meter	Flow meter at inlet of Clarifier T-3130	Direct reading from meter
T-3400	Filtered Water Tank	Flow Meter	Flow meters on NutShell Filters F-3230 & F-3240 inlets	The sum of both meters, when the filters are on "Active" status
T-3430	Filter Backwash Tank	Flow Meter	Flow meters on NutShell Filters F-3230 & F-3240 inlets	The sum of both meters, when the filters are on "Backwash" status
T-3500	Filtered Water Tank	Flow Meter	Flow meters on NutShell Filters F-3330 & F-3340 inlets	The sum of both meters, when the filters are on "Active" status
T-3530	Filter Backwash Tank	Flow Meter	Flow meters on NutShell Filters F-3330 & F-3340 inlets	The sum of both meters, when the filters are on "Backwash" status
T-4200	Soft Water Tank	Flow Meter	Flow meters on inlets of Softeners V-4010, V-4030, and V-4050	The sum of all flow meters, when the softeners are on "Softening" status
T-4290	Brine Tank	Flow Meter	Flow meter on Brine Make-up Pump Station (P-4230/40)	Direct reading from meter divided by 2 (half the flow goes to T-4300)
T-4300	Brine Tank	Flow Meter	Flow meter on Brine Make-up Pump Station (P-4230/40)	Direct reading from meter divided by 2 (half the flow goes to T-4290)
T-4400	Soft Water Tank	Flow Meter	Flow meters on inlets of Softeners V-4110, V-4130, and V-4150	The sum of all flow meters, when the softeners are on "Softening" status
T-4490	Brine Tank	Flow Meter	Flow meter on Brine Make-up Pump Station (P-4430/40)	Direct reading from meter divided by 2 (half the flow goes to T-4500)
T-4500	Brine Tank	Flow Meter	Flow meter on Brine Make-up Pump Station (P-4430/40)	Direct reading from meter divided by 2 (half the flow goes to T-4490)
T-4600	Water Injection Tank	Flow Meter	Flow meter on Disposal Pump Station (P-4610/20)	Direct reading from meter
T-5100	SulFerox Inventory Storage Tank	Flow Meter	Flow meter on Inventory Return Pump P-5110	Direct reading from meter
T-5120	SulFerox Iron Chelate Make-up Tank	Flow Meter	Flow meter on SULFEROX Make up Pump P-5140	Direct reading from meter
T-5130	SulFerox Iron Chelate Make-up Tank	Flow Meter	Flow meter on SULFEROX Make up Pump P-5150	Direct reading from meter
T-5160	SulFerox Caustic Tank	Delivery Ticket	Volume provided on delivery ticket	Direct reading from ticket
T-5180	SulFerox Inhibitor Tank	Delivery Ticket	Volume provided on delivery ticket	Direct reading from ticket
T-5200	SulFerox Defoamer Tank	Delivery Ticket	Volume provided on delivery ticket	Direct reading from ticket
T-5230	SulFerox Detergent Tank	Delivery Ticket	Volume provided on delivery ticket	Direct reading from ticket
T-5260	SulFerox Calcium Nitrate Tank	Delivery Ticket	Volume provided on delivery ticket	Direct reading from ticket
T-5820	SulFerox Filtrate Tank	Flow Meter	5780/90)	Direct reading from meter
T-6260	Sulfur dioxide/ wet electrostatic precipitator 25 percent Caustic Tank	Delivery Ticket	Volume provided on delivery ticket	Direct reading from ticket

T-6290	wet electrostatic precipitator 1 percent Caustic Tank	Flow Meter	6300/10)	Direct reading from meter
T-6320	Sulfur dioxide/Waste Tank	Flow Meter	6330/40)	Direct reading from meter
T-7030	Sludge Separation Tank	Flow Meter	Flow meter at inlet of Tank	Direct reading from meter
T-7070	Skim Oil Tank	Flow Meter	Flow meters at discharge of tank	The sum of flow meters, one at Skim Oil Transfer Pump Station and the other at Produce Water Transfer Pump station
T-7140	Sludge Separation Tank	Flow Meter	Flow meter at inlet of Tank	Direct reading from meter
T-7180	Skim Oil Tank	Flow Meter	Flow meters at discharge of tank	The sum of flow meters, one at Skim Oil Transfer Pump Station and the other at Produce Water Transfer Pump station
T-9650	Fire/Utility Water Storage Tank		excluded	
T-9860	Heat Medium Storage Tank	Delivery Ticket	Volume provided on delivery ticket	Direct reading from ticket
T-9960	Heat Medium Storage Tank	Delivery Ticket	Volume provided on delivery ticket	Direct reading from ticket

Light crude oil received will be measured by automated custody transfer equipment and truck volumes will be documented with receiving tickets. Oil sales will be measured by automated custody transfer equipment and documented in a sales ticket.

SG Fuel Use Measurement

Steam Generator Fuel Measurement

Natural gas fuel used in Project steam generators will be measured by orifice meter runs using multivariable differential pressure and gauge pressure transmitters. Flow calculations will conform to American Gas Association standards and will be performed in the steam generator's programmable logic control system.

Specific components for fuel gas metering and control are listed below.

Measurement or Control Location	Measurement or Control Component
Primary Fuel Meter Run	Rosemount 3095M DP & GP Transmitters with RTD Sensor Element (or equivalent)
Primary Fuel Control Element	Maxon Smartlink Fuel Flow Control Valve with Actuator (or equivalent)
Secondary Fuel Meter Run	Rosemount 3095M/DP & GP Transmitters with RTD Sensor Element (or equivalent)
Secondary Fuel Control Element	Maxon Smartlink Fuel Flow Control Valve with Actuator (or equivalent)
Center Fuel Meter Run	Rosemount 3095M DP & GP Transmitters with RTD Sensor Element (or equivalent).
Center Fuel Control Element	Maxon Smartlink Fuel Flow Control Valve with Actuator (or equivalent)

Additional specifications for Rosemount 3095M DP & GP transmitters and flow elements are included in Attachment E.

Overall fuel gas flow to each steam generator will also be controlled to on-off status. In accordance with NFPA 85 (2011 edition), Section 5.4.2.3, each steam generator's fuel gas line to the main burner will be equipped with two safety shutoff valves in series. A flame scanner will continuously monitor the presence of flame in the burner. On detection of loss of flame, the burner management system will close both fuel shut-off valves to prevent flow of fuel. Each shut-off valve will include a proof of closure switch, and a listed automatic valve proving system to ensure fuel shutoff. This design eliminates venting space between the valves as a means of assuring fuel shut-off. Therefore, unburnt fuel gas will not be vented from the steam generators.

Sulfatreat® Monitoring and Media Replacement Procedures

SulfaTreat Performance Monitoring and Bed Replacement

The proposed solid-bed SulfaTreat® produced gas sweetening system will be monitored for sulfur compound removal efficiency.

Hydrogen-sulfide and total Sulfur will be monitored using a sampling chromatographic gas analyzer. Data for produced gas flow rate, temperature, and pressure will also be collected.

Gas sampling will occur at the following locations:

- 1) Inlet to the lead SulfaTreat® vessel,
- 2) Transition between the lead and lag SulfaTreat® vessel, and
- 3) Outlet of the lag SulfaTreat® vessel.

The inlet monitoring location will document the sulfur compound concentration in the produced gas. The second monitoring location will detect when the lead vessel sulfur removal media has been exhausted (i.e. sulfur breakthrough). The third monitoring location will document that the sulfur removal system is working as designed. The monitoring system will also generate notifications indicating excess sulfur in the outlet of either vessel.

Upon notification of sulfur breakthrough, the lead and lag vessels will be reversed and media replacement on the previous lead vessel will be planned, scheduled and initiated. During media replacement, one vessel will perform all required sulfur removal. On-line monitoring will continue during media replacement to assure the produced gas meets the outlet requirements.

A general procedure for replacement of solid bed sweetening media in the hydrogen sulfide removal vessels would follow these steps:

1. Receive notification of condition requiring media replacement; plan and schedule work.
2. Isolate vessel for media replacement from process flow. This will generally have been the lead vessel.
3. Complete energy control procedures to removal all potential hazards.
4. Purge produced gas to second vessel.
5. Remove spent media.
6. Load fresh media into vessel.
7. Place vessel into service.

Spent media is non-hazardous and will be sent to an appropriate facility. Transportation of new and spent media is included in the Air Quality Impact Assessment.

Gas Flaring Scenarios

Flaring Scenarios

A number of operational scenarios that could potentially result in gas flow to the flare were evaluated. There are no flare scenarios which are expected to result in more than 1.5 hours/day use of the emergency flare. Untreated gas could potentially be flared in the event that there is excess pressure in produced gas system. A summary of the potential emergency flaring scenarios is provided below:

Scenario Number	Flaring Scenario	Gas Flared	Facility Response	Maximum Flaring Durations	Expected Flow, H2S Concentration and SOx Emissions
1	Power Outage: Residual system pressure would result in the flow of treated produced gas to the emergency flare.	Sweetened produced gas may be routed to emergency flare	Automated shutdown of field production system.	5 minutes/day 0.33 hr/yr	0.736 MSCFD, 150 ppmv 0.02 lbs/day
2	Excess pressure: Blockage in flow path of produced gas system	Un-sweetened produced gas may be routed to emergency flare	Automated shutdown of field production system.	5 minutes/day 0.33 hr/yr	0.736 MSCFD, 1% TS, 1.32 lb/day; 0.003 T/yr
3	Excess pressure: Blockage in flow path in free water knockout vessel or treater	A mixture of utility provided gas and un-sweetened produced gas may be routed to emergency flare	Automated shutdown of field production system. Gas flow to flare continues until vessel pressure drops below MAWP of 125 psig	15 minutes/day 6 hrs/year	0.150 MSCFD, 1% TS, 0.27 lb/day; 0.003 T/yr
4	Shutdown of 62.5 MM BTU/hr produced gas steam generator (Modeled worst case)	Sweetened produced gas may be routed to emergency flare	Redirect gas flow to 85 MMBTU/hr SGs or automated shutdown of field production system.	90 minutes per day 180 hrs/yr	57 MSCFD, 80 ppmv 0.82 lbs/day; 0.05 T/yr
5	Excess pressure in production group station	Not expected to result in emergency flare use	Automated shutdown of field production system prior to reaching group station MAWP	N/A	
6	Excess pressure in sweetening vessels	Not expected to result in emergency flare use	Discharge pressure of upstream systems cannot exceed MAWP of Sweetening vessels	N/A	

ATTACHMENT F

Material Safety Data Sheets

- Amerlock 400
 - Amershield
- Hempadur 15570
- Hempadur 17369
 - Surftreat
- Interseal 670

Amerlock 400

SAFETY DATA SHEET

This Safety Data Sheet is prepared in accordance with Annex II to Regulation (EC) No. 1907/2006.

PPG Protective &
Marine Coatings**AMERLOCK 2 C CURE**

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 29-06-09**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING****Product information**

Trade name : AMERLOCK 2 C CURE
Technical data sheet number : For further information see Technical Data Sheet.

Recommended use : coating

Company : PPG Coatings SPRL/BVBA
 Noordersingel 23
 B-2040 Borgerhout

Telephone : +32 3 3606470
Telefax : +32 3 3606435
Emergency telephone number : +31 20 4075210
E-mail address : PMC.Safety@PPG.com

2. HAZARDS IDENTIFICATION**Symbol(s) :**

Corrosive

Dangerous for the environment

Hazardous components :

3-aminomethyl-3,5,5-trimethylcyclohexylamine

R-phrase(s) :

FLAMMABLE.

HARMFUL BY INHALATION AND IF SWALLOWED.

CAUSES BURNS.

MAY CAUSE SENSITIZATION BY SKIN CONTACT.

TOXIC TO AQUATIC ORGANISMS, MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	EC No.	CAS-No.	DSD	Note	Classification	Concentration
benzyl alcohol	202-859-9	100-51-6	19th		Xn; R20/22	>=2.50 - <10.00%
cyclohexanone	203-631-1	108-94-1	19th		R10 Xn; R20	>=2.50 - <10.00%
isobutyl methyl ketone	203-550-1	108-10-1	25th		F; R11 Xn; R20 Xi; R36/37 R66	>=10.00 - <20.00%

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Marine Coatings**AMERLOCK 2 C CURE**

MSDS EU 01 / EN Version 2

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Revision date 29-06-09

iso-butanol	201-148-0	78-83-1	25th		R67 R10 Xi; R37/38, R41	>=1.00 - <2.50%
2,4,6-tris-(dimethylaminomethyl)-phenol	202-013-9	90-72-2	19th		Xn; R22 Xi; R36/38	>=2.50 - <10.00%
triethylenetetramine	203-950-6	112-24-3	29th		Xn; R21 C; R34 R43 R52, R53	>=0.10 - <1.00%
3-aminomethyl-3,5,5-trimethylcyclohexylamine	220-666-8	2855-13-2	29th		Xn; R21/22 C; R34 R43 R52, R53	>=5.00 - <10.00%
nonylphenol	246-672-0	25154-52-3	29th		Repr.Cat.3; R62 Repr.Cat.3; R63 Xn; R22 C; R34 N; R50, R53	>=2.50 - <5.00%
2-(8-Heptadecenyl)-4,5-dihydro-1H-imidazole-1-ethylamine	222-551-8	3528-63-0			C; R34 Xn; R22 N; R51/53	>=0.10 - <1.00%

Producer declares that for R-phrases not mentioned in chapters 3, the entire amount of hazardous substances is below limits. For components with an occupational threshold limit value see chapter 8.

If multiple components with identical identifiers appear, these have different hazardous properties, e.g. flashpoint.

4. FIRST AID MEASURES

- General advice** : When symptoms persist or in all cases of doubt seek medical advice. Never give anything by mouth to an unconscious person.
- Eye contact** : Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart. Remove contact lenses. Seek medical advice.
- Skin contact** : Take off all contaminated clothing immediately. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.
- Inhalation** : Remove to fresh air. Keep patient warm and at rest. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position and seek medical advice.
- Ingestion** : If accidentally swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.
- Burns** : If spills on clothing catch fire, wash with plenty of water. Remove loose clothing. Do not remove clothing that has melted to the skin. Obtain medical attention.

5. FIRE-FIGHTING MEASURES

- Specific hazards during fire fighting** : As the product contains combustible organic components, fire will produce dense black smoke containing hazardous products of combustion (see section 10). Exposure to decomposition products may be a hazard to health. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.

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PPG Protective & Marine Coatings

AMERLOCK 2 C CURE

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 29-06-09

- | | | |
|---|---|--|
| Special protective equipment for fire-fighters | : | In the event of fire, wear self-contained breathing apparatus. |
| Suitable extinguishing media | : | Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Keep containers and surroundings cool with water spray. |
| Extinguishing media which shall not be used for safety reasons | : | Do NOT use water jet. |

6. ACCIDENTAL RELEASE MEASURES

- | | | |
|----------------------------------|---|--|
| Personal precautions | : | Use personal protective equipment. Ventilate the area. Refer to protective measures listed in sections 7 and 8. Wear respiratory protection. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. Remove all sources of ignition. |
| Environmental precautions | : | Try to prevent the material from entering drains or water ways. If the product contaminates rivers and lakes or drains inform respective authorities. |
| Methods for cleaning up | : | Clean with detergents. Avoid solvents. Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). |
| Additional advice | : | Refer to section 15 for specific national regulation. |

7. HANDLING AND STORAGE

- | | | |
|--|---|---|
| Handling | : | |
| Safe handling advice | : | Avoid exceeding of the given occupational exposure limits (see section 8). Use only in area provided with appropriate exhaust ventilation. Avoid contact with skin, eyes and clothing. Smoking, eating and drinking should be prohibited in the application area. Avoid inhalation of vapour or mist. For personal protection see section 8. |
| Advice on protection against fire and explosion | : | Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. When transferring from one container to another apply earthing measures and use conductive hose material. No sparking tools should be used. Operators should wear anti-static footwear and clothing and floors should be of the conducting type. Isolate from sources of heat, sparks and open flame. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. No smoking. The accumulation of contaminated rags and dry overspray, particularly in spray booth filters, may result in spontaneous combustion. Good housekeeping standards, regular safe removal of waste materials and regular maintenance of spray booth filters will minimise the risks of spontaneous combustion and other fire hazards. |
| Storage | : | |
| Requirements for storage areas and containers | : | Observe label precautions. Prevent unauthorized access. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store between 5 and 30°C (41 - 86 F) in a dry, well ventilated place away from sources of heat, ignition and direct sunlight. Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Electrical installations / working materials must comply with the technological safety standards. Keep away from sources of ignition - No smoking. Store in accordance with the particular national regulations (see section 15). |
| Advice on common storage | : | Keep away from oxidising agents and strongly acid or alkaline materials. |

**AMERLOCK 2 C CURE**

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 29-06-09**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Components on the national list and/or the European TLV list (98/24/EC):**

Components	CAS-No.	Value [mg/m ³]	Value [ppm]	Basis
cyclohexanone <i>can be absorbed through skin</i>	108-94-1	40.8	10	EU ELV TWA
		81.6	20	EU ELV STEL
isobutyl methyl ketone	108-10-1	83	20	EU ELV TWA
		208	50	EU ELV STEL

Personal protective equipment**General advice****Respiratory protection**

- : When operators, whether spraying or not, have to work inside the spray booth, ventilation is unlikely to be sufficient to control particulates and solvent vapour in all cases. In such circumstances they should wear a compressed air-fed respirator during the spraying process and until such time as the particulates and solvent vapour concentration has fallen below the exposure limits.

Hand protection

- : For prolonged or repeated contact use protective gloves. Barrier creams may help to protect the exposed areas of skin, they should however not be applied once exposure has occurred. Skin should be washed after contact. Use chemical resistant gloves classified under Standard EN 374: Protective gloves against chemicals and micro-organisms.

Recommended gloves: Product is corrosive. Please contact your hand protection supplier for further advice.

When prolonged or frequently repeated contact may occur, a glove with a protection class of 6 (breakthrough time greater than 480 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 2 or higher (breakthrough time greater than 30 minutes according to EN 374) is recommended.

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection

- : Chemical resistant goggles must be worn.

Skin and body protection

- : Personnel should wear protective clothing. Skin should be washed after contact. Working clothes must not consist of textiles, which show a dangerous melting behaviour in case of fire. Workers should wear antistatic footwear.

Additional advice**Environmental protection**

- : Refer to national regulations in chapter 15 for regulations on environmental protection.

Personal protection

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PPG Protective & Marine Coatings

AMERLOCK 2 C CURE

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 29-06-09

Protective equipment : P3A3 full-face combi mask, safety gloves, safety suit and boots



Please contact your personal protection equipment supplier for further advice

9. PHYSICAL AND CHEMICAL PROPERTIES

Form : viscous
Colour :
Odour : strong amine-like
Flash point : 24.0 °C

Note: Calculated
Autoignition temperature :
Upper explosion limit : 9.42 %(V)
384.72 g/m3

Lower explosion limit : 1.54 %(V)
63.29 g/m3

Density : 1.36 g/cm3
at 20 °C
Water solubility : partly soluble

pH :
Viscosity, dynamic : 80,000 mPa.s

Flow time : >= 60 s
Transversal section: 6 mm
Method: ISO 2431 (EN 535) 6 mm CUP

10. STABILITY AND REACTIVITY

Conditions to avoid : Avoid temperatures above 60°C (140 F), direct sunlight and contact with sources of heat.
Hazardous reactions : Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions.
Hazardous decomposition products : In case of fire hazardous decomposition products may be produced such as: Carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), dense black smoke.

11. TOXICOLOGICAL INFORMATION

Product information : There is no data available for this product.
The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and classified for toxicological hazards accordingly. See Sections 3 and 15 for details.
Acute oral toxicity : May cause nausea, abdominal spasms and irritation of the mucous membranes.

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AMERLOCK 2 C CURE

MSDS EU 01 / EN Version 2

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Revision date 29-06-09

- Acute inhalation toxicity** : Exposure to component solvent vapours concentration in excess of the stated occupational exposure limit may result in adverse health effects. Such as: mucous membrane irritation, respiratory system irritation, adverse effects on kidney, liver and central nervous system. Symptoms and signs: headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases loss of consciousness.
- Skin irritation** : Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in desiccation of the skin. The product may be absorbed through the skin.
- Eye contact** : May cause irreversible eye damage.
- Further information** : There is no data available for this product.

Acute Toxicity Data for Components

benzyl alcohol(100-51-6)

- Acute oral toxicity** : LD50: 1,230 mg/kg (rat)
- Acute dermal toxicity** : LD50: 2,000 mg/kg (rabbit)

cyclohexanone(108-94-1)

- Acute oral toxicity** : LD50: 1,890 mg/kg (rat)
- Acute dermal toxicity** : LD50: 950 mg/kg (rabbit)

2,4,6-tris-(dimethylaminomethyl)-phenol(90-72-2)

- Acute oral toxicity** : LD50: 1,200 mg/kg (rat)

triethylenetetramine(112-24-3)

- Acute dermal toxicity** : LD50: 805 mg/kg (rabbit)

3-aminomethyl-3,5,5-trimethylcyclohexylamine(2855-13-2)

- Acute oral toxicity** : LD50: 1,030 mg/kg (rat)

nonylphenol(25154-52-3)

- Acute oral toxicity** : LD50: 1,620 mg/kg (rat)
- Acute inhalation toxicity** : LC50: 2 mg/l (rat)

12. ECOLOGICAL INFORMATION

- Further information** : No data is available on the product itself. The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is classified for ecotoxicological properties accordingly. See sections 3 and 15 for details. The product should not be allowed to enter drains, water courses or the soil.

13. DISPOSAL CONSIDERATIONS

- Product** : The product should not be allowed to enter drains, water courses or the soil. Disposal together with normal waste is not allowed. Special disposal required according to local regulations.
- Waste key for the unused product** : The European Waste Catalogue classification of this product, when disposed of as waste is:

SAFETY DATA SHEET

This Safety Data Sheet is prepared in accordance with Annex II to Regulation (EC) No. 1907/2006.



PPG Protective & Marine Coatings

AMERLOCK 2 C CURE

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 29-06-09

08 01 11 Waste paint and varnish containing organic solvents or other dangerous substances.

If this product is fully cured or mixed with other wastes, this code may no longer apply. If mixed with other wastes, the appropriate code should be assigned. For further information contact your local waste authority

14. TRANSPORT INFORMATION

Transport within user's premises: always transport in closed containers that are upright, labelled and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport to be in accordance with ADR for road, IMDG for sea and IATA for air transport:

UN-Number : 3469
Proper shipping name : PAINT RELATED MATERIAL, FLAMMABLE, CORROSIVE
Class : 3
Sub Class : 8
Packing group : III
Label : 3 + 8
Proper shipping name (ADR) : PAINT RELATED MATERIAL, FLAMMABLE, CORROSIVE

Marine Pollutant (IMDG) : Marine Pollutant
Marine Pollutant component (IMDG) : nonylphenol
EmS (IMDG) : F-E, S-C

Limited quantity (ADR) : Max. per inner pack. : 5.00 L
Max. per outer pack. : 30.00 KG
Limited quantity (IMDG) : Max. per inner pack. : 5.00 L
Max. per outer pack. : 30.00 KG

15. REGULATORY INFORMATION

The product is classified and labelled in accordance with Directive 1999/45/EC.



Corrosive



Dangerous for the environment

Hazardous components which must be listed on the label:

- 3-aminomethyl-3,5,5-trimethylcyclohexylamine

R-phrases : R10 Flammable.
R20/22 Harmful by inhalation and if swallowed.
R34 Causes burns.
R43 May cause sensitization by skin contact.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SAFETY DATA SHEET

This Safety Data Sheet is prepared in accordance with Annex II to Regulation (EC) No. 1907/2006.

PPG Protective &
Marine Coatings**AMERLOCK 2 C CURE**

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 29-06-09

	S-phrase(s)	:	S23	Do not breathe spray.
			S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
			S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
			S38	In case of insufficient ventilation, wear suitable respiratory equipment.
			S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
		S61	Avoid release to the environment. Refer to special instructions/ Safety data sheets.	

The information contained in this safety data sheet does not constitute the user's own assessment of workplace risks, as required by other health and safety legislation. The provisions of the national health and safety at work regulations apply to the use of this product at work.

National legislation**16. OTHER INFORMATION****Explanation of R-phrases mentioned in section 3**

	benzyl alcohol		R20/22	Harmful by inhalation and if swallowed.
	cyclohexanone		R10	Flammable.
			R20	Harmful by inhalation.
	isobutyl methyl ketone		R11	Highly flammable.
			R20	Harmful by inhalation.
			R36/37	Irritating to eyes and respiratory system.
			R66	Repeated exposure may cause skin dryness or cracking.
	iso-butanol		R10	Flammable.
			R37/38	Irritating to respiratory system and skin.
			R41	Risk of serious damage to eyes.
			R67	Vapours may cause drowsiness and dizziness.
	2,4,6-tris-(dimethylaminomethyl)-phenol		R22	Harmful if swallowed.
			R36/38	Irritating to eyes and skin.
	triethylenetetramine		R21	Harmful in contact with skin.
			R34	Causes burns.
			R43	May cause sensitization by skin contact.
			R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	3-aminomethyl-3,5,5-trimethylcyclohexylamine		R21/22	Harmful in contact with skin and if swallowed.
			R34	Causes burns.
			R43	May cause sensitization by skin contact.
			R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SAFETY DATA SHEET

This Safety Data Sheet is prepared in accordance with Annex II to Regulation (EC) No. 1907/2006.



PPG Protective & Marine Coatings

AMERLOCK 2 C CURE

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 29-06-09

Nonylphenol	R22	Harmful if swallowed.
	R34	Causes burns.
	R62	Possible risk of impaired fertility.
	R63	Possible risk of harm to the unborn child.
	R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
2-(8-Heptadecenyl)-4,5-dihydro-1H-imidazole-1-ethylamine	R22	Harmful if swallowed.
	R34	Causes burns.
	R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

This Safety Data Sheet is based on the Safety Data Sheets obtained from the producer/manufacturer or/and internet databases and valid regulations considering hazardous substances/preparations.

Training advice:

Persons taking part in a turnover of hazardous products ought to be trained in product handling, safety and hygiene.

Drivers ought to be trained and obtain a certificate in accordance with the requirements of transport regulations (ADR).

Version: 2

Revision date 29.06.2009

The information contained in this safety data sheet is based on the present state of knowledge and current European and National legislation at the date of issue. The supplier reserves the right to modify data on the safety data sheet without further notice. Any change in data will normally be followed by the issue of a new safety data sheet. The user should check the date of issue and if more than 12 months have elapsed, then the data should only be used after checking with the nearest sales office of the supplier to establish that the data is still valid. As the specific conditions of use of the product are outside the suppliers control, the supplier is not responsible for the (negative) consequences of these specific conditions of use, which are outside of the suppliers control and which are not compliant with the handling, storage and other instructions in this safety data sheet.

After all component(s) stated on the relevant Technical Data Sheet have been mixed the safety precautions mentioned on each of the component(s) safety data sheets and labels should be used in assessing the safety precautions of the mixed product.

Technical data sheet number XX

**AMERLOCK 2/400 RESIN**

MSDS EU 01 / EN Version 1

Print Date 6/7/2010
Revision date 25-05-09**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING****Product information**

Trade name : AMERLOCK 2/400 RESIN

Recommended use : coating

Company : PPG Coatings SPRL/BVBA
Noordersingel 23
B-2040 Borgerhout

Telephone : +32 3 3606470

Telefax : +32 3 3606435

Emergency telephone number : +31 20 4075210

E-mail address : PMC.Safety@PPG.com

2. HAZARDS IDENTIFICATION**Symbol(s) :**

Irritant

Dangerous for the environment

Hazardous components :reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecularweight \leq 700)**R-phrases(s) :**

FLAMMABLE.

IRRITATING TO EYES AND SKIN.

MAY CAUSE SENSITIZATION BY SKIN CONTACT.

TOXIC TO AQUATIC ORGANISMS, MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT.

P-phrases(s) :

Contains epoxy constituents. See information supplied by the manufacturer.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	EC No.	CAS-No.	DSD	Note	Classification	Concentration
Solvent naphtha (petroleum), light arom.	265-199-0	64742-95-6		Nota H, Nota P	R10 N; R51/53 Xn; R65 Xi; R37 R66 R67	\geq 2.50 - <10.00%

SAFETY DATA SHEET

This Safety Data Sheet is prepared in accordance with Annex II to Regulation (EC) No. 1907/2006.



PPG Protective & Marine Coatings

AMERLOCK 2/400 RESIN

MSDS EU 01 / EN Version 1

Print Date 6/7/2010
Revision date 25-05-09

mesitylene	203-604-4	108-67-8	29th		R10 Xi; R37 N; R51, R53	>=0.10 - <1.00%
reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecularweight \leq 700)		25068-38-6	29th		Xi; R36/38 R43 N; R51, R53	>=50.00 - <75.00%
1,2,4-trimethylbenzene	202-436-9	95-63-6	24th		R10 Xn; R20 Xi; R36/37/38 N; R51, R53	>=1.00 - <2.50%
cumene	202-704-5	98-82-8	26th		R10 Xn; R65 Xi; R37 N; R51, R53	>=0.10 - <1.00%

Producer declares that for R-phrases not mentioned in chapters 3, the entire amount of hazardous substances is below limits. For components with an occupational threshold limit value see chapter 8. The benzene content of this product is less than 0.1%. Nota P and H apply.

If multiple components with identical identifiers appear, these have different hazardous properties, e.g. flashpoint.

4. FIRST AID MEASURES

- General advice** : When symptoms persist or in all cases of doubt seek medical advice. Never give anything by mouth to an unconscious person.
- Eye contact** : Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart. Remove contact lenses. Seek medical advice.
- Skin contact** : Take off all contaminated clothing immediately. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.
- Inhalation** : Remove to fresh air. Keep patient warm and at rest. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position and seek medical advice.
- Ingestion** : If accidentally swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.
- Burns** : If spills on clothing catch fire, wash with plenty of water. Remove loose clothing. Do not remove clothing that has melted to the skin. Obtain medical attention.

5. FIRE-FIGHTING MEASURES

- Specific hazards during fire fighting** : As the product contains combustible organic components, fire will produce dense black smoke containing hazardous products of combustion (see section 10). Exposure to decomposition products may be a hazard to health. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.
- Special protective equipment for fire-fighters** : In the event of fire, wear self-contained breathing apparatus.
- Suitable extinguishing media** : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Keep containers and surroundings cool with water spray.
- Extinguishing media which shall not be used for safety reasons** : Do NOT use water jet.

AMERLOCK 2/400 RESIN

MSDS EU 01 / EN Version 1

Print Date 6/7/2010
Revision date 25-05-09**6. ACCIDENTAL RELEASE MEASURES**

- Personal precautions** : Use personal protective equipment. Ventilate the area. Refer to protective measures listed in sections 7 and 8. Wear respiratory protection. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. Remove all sources of ignition.
- Environmental precautions** : Try to prevent the material from entering drains or water ways. If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods for cleaning up** : Clean with detergents. Avoid solvents. Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
- Additional advice** : Refer to section 15 for specific national regulation.

7. HANDLING AND STORAGE**Handling**

- Safe handling advice** : Avoid exceeding of the given occupational exposure limits (see section 8). Use only in area provided with appropriate exhaust ventilation. Avoid contact with skin, eyes and clothing. Smoking, eating and drinking should be prohibited in the application area. Avoid inhalation of vapour or mist. For personal protection see section 8.
- Advice on protection against fire and explosion** : Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. When transferring from one container to another apply earthing measures and use conductive hose material. No sparking tools should be used. Operators should wear anti-static footwear and clothing and floors should be of the conducting type. Isolate from sources of heat, sparks and open flame. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. No smoking. The accumulation of contaminated rags and dry overspray, particularly in spray booth filters, may result in spontaneous combustion. Good housekeeping standards, regular safe removal of waste materials and regular maintenance of spray booth filters will minimise the risks of spontaneous combustion and other fire hazards.

Storage

- Requirements for storage areas and containers** : Observe label precautions. Prevent unauthorized access. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store between 5 and 30°C (41 - 86 F) in a dry, well ventilated place away from sources of heat, ignition and direct sunlight. Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Electrical installations / working materials must comply with the technological safety standards. Keep away from sources of ignition - No smoking. Store in accordance with the particular national regulations (see section 15).
- Advice on common storage** : Keep away from oxidising agents and strongly acid or alkaline materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components on the national list and/or the European TLV list (98/24/EC):**

Components	CAS-No.	Value [mg/m ³]	Value [ppm]	Basis

SAFETY DATA SHEET

This Safety Data Sheet is prepared in accordance with Annex II to Regulation (EC) No. 1907/2006.

PPG Protective &
Marine Coatings**AMERLOCK 2/400 RESIN**

MSDS EU 01 / EN Version 1

Print Date 6/7/2010
Revision date 25-05-09

Solvent naphtha (petroleum), light arom.	64742-95-6	125		ESIG TWA
1,2,4-trimethylbenzene	95-63-6	100	20	EU ELV TWA
mesitylene	108-67-8	100	20	EU ELV TWA
cumene <i>can be absorbed through skin</i>	98-82-8	100 250	20 50	EU ELV TWA EU ELV STEL

Personal protective equipment**General advice****Respiratory protection**

- : When operators, whether spraying or not, have to work inside the spray booth, ventilation is unlikely to be sufficient to control particulates and solvent vapour in all cases. In such circumstances they should wear a compressed air-fed respirator during the spraying process and until such time as the particulates and solvent vapour concentration has fallen below the exposure limits.

Hand protection

- : For prolonged or repeated contact use protective gloves. Barrier creams may help to protect the exposed areas of skin, they should however not be applied once exposure has occurred. Skin should be washed after contact. Use chemical resistant gloves classified under Standard EN 374: Protective gloves against chemicals and micro-organisms.

Recommended gloves: Nitrile rubber
Minimum breakthrough time: 480 min

The recommended gloves are based on most common solvent in this product.

When prolonged or frequently repeated contact may occur, a glove with a protection class of 6 (breakthrough time greater than 480 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 2 or higher (breakthrough time greater than 30 minutes according to EN 374) is recommended.

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection

- : Chemical resistant goggles must be worn.

Skin and body protection

- : Personnel should wear protective clothing. Skin should be washed after contact. Working clothes must not consist of textiles, which show a dangerous melting behaviour in case of fire. Workers should wear antistatic footwear.

Additional advice**Environmental protection**

- : Refer to national regulations in chapter 15 for regulations on environmental protection.

Personal protection

AMERLOCK 2/400 RESIN

MSDS EU 01 / EN Version 1

Print Date 6/7/2010
Revision date 25-05-09**Protective equipment** : Eye protection, safety gloves and combi mask P1A1*Please contact your personal protection equipment supplier for further advice***9. PHYSICAL AND CHEMICAL PROPERTIES**

Form	: viscous
Colour	: various
Odour	: mild aromatic
Flash point	: 47.0 °C
	Note: Calculated
Autoignition temperature	: Note: no data available
Upper explosion limit	: 8.16 %(V) 406.11 g/m ³
Lower explosion limit	: 0.91 %(V) 45.41 g/m ³
Density	: 1.49 g/cm ³ at 20 °C
Water solubility	: no data available
pH	: no data available
Viscosity, dynamic	: 12,500 mPa.s at 23 °C
Flow time	: >= 60 s Transversal section: 6 mm Method: ISO 2431 (EN 535) 6 mm CUP

10. STABILITY AND REACTIVITY

Conditions to avoid	: Avoid temperatures above 60°C (140 F), direct sunlight and contact with sources of heat.
Hazardous reactions	: Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions.
Hazardous decomposition products	: In case of fire hazardous decomposition products may be produced such as: Carbon dioxide (CO ₂), carbon monoxide (CO), oxides of nitrogen (NO _x), dense black smoke.

11. TOXICOLOGICAL INFORMATION

Product information	: There is no data available for this product. The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and classified for toxicological hazards accordingly. See Sections 3 and 15 for details.
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AMERLOCK 2/400 RESIN

MSDS EU 01 / EN Version 1

Print Date 6/7/2010
Revision date 25-05-09

- Acute oral toxicity** : May cause nausea, abdominal spasms and irritation of the mucous membranes.
- Acute inhalation toxicity** : Exposure to component solvent vapours concentration in excess of the stated occupational exposure limit may result in adverse health effects. Such as: mucous membrane irritation, respiratory system irritation, adverse effects on kidney, liver and central nervous system. Symptoms and signs: headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases loss of consciousness.
- Skin irritation** : Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in desiccation of the skin. The product may be absorbed through the skin. Repeated skin contact may lead to irritation and to sensitization, possible with cross-sensitization to other epoxies.
- Eye contact** : Irritating to eyes.
- Further information** : There is no data available for this product.

Acute Toxicity Data for Components

cumene(98-82-8)

Acute oral toxicity : LD50: 382 mg/kg (rat)**12. ECOLOGICAL INFORMATION**

- Further information** : The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is classified for ecotoxicological properties accordingly. See sections 3 and 15 for details.

13. DISPOSAL CONSIDERATIONS

- Product** : The product should not be allowed to enter drains, water courses or the soil. Disposal together with normal waste is not allowed. Special disposal required according to local regulations.

- Waste key for the unused product** : The European Waste Catalogue classification of this product, when disposed of as waste is:

08 01 12 Waste paint and varnish other than those mentioned in 08 01 11.

If this product is fully cured or mixed with other wastes, this code may no longer apply. If mixed with other wastes, the appropriate code should be assigned. For further information contact your local waste authority

14. TRANSPORT INFORMATION

Transport within user's premises: always transport in closed containers that are upright, labelled and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport to be in accordance with ADR for road, IMDG for sea and IATA for air transport:

UN-Number : 1263
 Proper shipping name : PAINT
 Class : 3
 Packing group : III
 Label : 3

AMERLOCK 2/400 RESIN

MSDS EU 01 / EN Version 1

Print Date 6/7/2010
Revision date 25-05-09

Proper shipping name (ADR) : PAINT

Marine Pollutant (IMDG) : Marine Pollutant
 Marine Pollutant component (IMDG) : epoxy resin (Mw <= 700)
 EmS (IMDG) : F-E, S-E

Limited quantity (ADR) : Max. per inner pack. : 5.00 L
 Max. per outer pack. : 30.00 KG

Limited quantity (IMDG) : Max. per inner pack. : 5.00 L
 Max. per outer pack. : 30.00 KG

15. REGULATORY INFORMATION

The product is classified and labelled in accordance with Directive 1999/45/EC.

**Irritant****Dangerous for the environment****Hazardous components which must be listed on the label:**

- reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecularweight ≤ 700)

R-phrases(s) : R10 Flammable.
 R36/38 Irritating to eyes and skin.
 R43 May cause sensitization by skin contact.
 R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-phrases(s) : S23 Do not breathe spray.
 S36/37 Wear suitable protective clothing and gloves.
 S38 In case of insufficient ventilation, wear suitable respiratory equipment.
 S61 Avoid release to the environment. Refer to special instructions/ Safety data sheets.

P-phrases(s) : Contains epoxy constituents. See information supplied by the manufacturer.

The information contained in this safety data sheet does not constitute the user's own assessment of workplace risks, as required by other health and safety legislation. The provisions of the national health and safety at work regulations apply to the use of this product at work.

National legislation

AMERLOCK 2/400 RESIN

MSDS EU 01 / EN Version 1

Print Date 6/7/2010
Revision date 25-05-09**16. OTHER INFORMATION**

This product contains a complex mixture of hydrocarbons. Detailed information can be obtained from the producer.

Explanation of R-phrases mentioned in section 3

Solvent naphtha (petroleum), light arom.	R10	Flammable.
	R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	R65	Harmful: may cause lung damage if swallowed.
	R37	Irritating to respiratory system.
	R66	Repeated exposure may cause skin dryness or cracking.
mesitylene	R67	Vapours may cause drowsiness and dizziness.
	R10	Flammable.
	R37	Irritating to respiratory system.
reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecularweight \leq 700)	R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	R36/38	Irritating to eyes and skin.
	R43	May cause sensitization by skin contact.
1,2,4-trimethylbenzene	R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	R10	Flammable.
	R20	Harmful by inhalation.
	R36/37/38	Irritating to eyes, respiratory system and skin.
cumene	R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	R10	Flammable.
	R37	Irritating to respiratory system.
	R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	R65	Harmful: may cause lung damage if swallowed.

This Safety Data Sheet is based on the Safety Data Sheets obtained from the producer/manufacturer or/and internet databases and valid regulations considering hazardous substances/preparations.

Training advice:

Persons taking part in a turnover of hazardous products ought to be trained in product handling, safety and hygiene.

Drivers ought to be trained and obtain a certificate in accordance with the requirements of transport regulations (ADR).

Version: 1

Revision date 25.05.2009

The information contained in this safety data sheet is based on the present state of knowledge and current European and National legislation at the date of issue. The supplier reserves the right to modify data on the safety data sheet without further notice. Any change in data will normally be followed by the issue of a new safety data sheet. The user should check the date of issue and if more than 12 months have elapsed, then the data should only be used after checking with the nearest sales office of the supplier to establish that the data is still valid. As the specific conditions of use of the product are outside the suppliers control, the supplier is not responsible for the (negative) consequences of these specific conditions of use, which are outside of the suppliers control and which are not compliant with the handling, storage and other instructions in this safety data sheet.

SAFETY DATA SHEET

This Safety Data Sheet is prepared in accordance with Annex II to Regulation (EC) No. 1907/2006.



**PPG Protective &
Marine Coatings**

AMERLOCK 2/400 RESIN

MSDS EU 01 / EN Version 1

Print Date 6/7/2010
Revision date 25-05-09

After all component(s) stated on the relevant Technical Data Sheet have been mixed the safety precautions mentioned on each of the component(s) safety data sheets and labels should be used in assessing the safety precautions of the mixed product.

SAFETY DATA SHEET

Version 3.7
Revision Date 03/03/2015
Print Date 07/29/2015

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**

Product name : Poly(Bisphenol A-co-epichlorohydrin)
Product Number : 181196
Brand : Aldrich
CAS-No. : 25068-38-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Acute toxicity, Oral (Category 4), H302
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Skin sensitisation (Category 1), H317
Carcinogenicity (Category 1B), H350
Acute aquatic toxicity (Category 2), H401
Chronic aquatic toxicity (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H350 May cause cancer.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201 Obtain special instructions before use.

P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust or mist.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P281	Use personal protective equipment as required.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : (C15 H16 O2 . C3 H5 Cl O)x

Component	Classification	Concentration
Reaction product: bisphenol-A(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)		
CAS-No.	25068-38-6	<= 100 %
EC-No.	500-033-5	
Index-No.	603-074-00-8	
Epichlorhydrin		
CAS-No.	106-89-8	>= 5 - < 10 %
EC-No.	203-439-8	
Index-No.	603-026-00-6	
Registration number	01-2119457436-33-XXXX	

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES**5.1 Extinguishing media****Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE**7.1 Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Epichlorhydrin	106-89-8	TWA	0.500000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Male reproductive Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		Potential Occupational Carcinogen See Appendix A		
		TWA	5.000000 ppm 19.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation The value in mg/m3 is approximate.		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- a) Appearance Form: pellets
- b) Odour No data available
- c) Odour Threshold No data available
- d) pH No data available
- e) Melting point/freezing point No data available
- f) Initial boiling point and No data available

boiling range

- | | |
|---|----------------------------|
| g) Flash point | No data available |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | No data available |
| l) Vapour density | No data available |
| m) Relative density | 1.18 g/mL at 25 °C (77 °F) |
| n) Water solubility | No data available |
| o) Partition coefficient: n-octanol/water | No data available |
| p) Auto-ignition temperature | No data available |
| q) Decomposition temperature | No data available |
| r) Viscosity | No data available |
| s) Explosive properties | No data available |
| t) Oxidizing properties | No data available |

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 13,600 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity). Lungs, Thorax, or Respiration:Dyspnea. Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation**Germ cell mutagenicity**

No data available

Ames test

Result: positive

Carcinogenicity

IARC: 2A - Group 2A: Probably carcinogenic to humans (Epichlorhydrin)

NTP: Reasonably anticipated to be a human carcinogen (Epichlorhydrin)

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence (Epichlorhydrin)

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

No data available

12.2 Persistence and degradability

Biodegradability Result: - According to the results of tests of biodegradability this product is not readily biodegradable.

Remarks: No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700))
Marine pollutant:yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700))

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

The following components are subject to reporting levels established by SARA Title III, Section 302:

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)	25068-38-6	
Epichlorhydrin	106-89-8	2008-11-03

New Jersey Right To Know Components

	CAS-No.	Revision Date
Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)	25068-38-6	
Epichlorhydrin	106-89-8	2008-11-03

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the		

State of California to cause cancer.
Epichlorhydrin

106-89-8

2007-09-28

WARNING: This product contains a chemical known to the
State of California to cause birth defects or other reproductive
harm.
Epichlorhydrin

CAS-No.
106-89-8

Revision Date
2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
Eye Dam.	Serious eye damage
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H226	Flammable liquid and vapour.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H350	May cause cancer.
H401	Toxic to aquatic life.
H402	Harmful to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
Skin Corr.	Skin corrosion
Skin Irrit.	Skin irritation
Skin Sens.	Skin sensitisation

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.7

Revision Date: 03/03/2015

Print Date: 07/29/2015

Amersfield

**AMERSHIELD RESIN**

MSDS EU 01 / EN Version 3

Print Date 6/7/2010
Revision date 28-06-09**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING****Product information****Trade name** : AMERSHIELD RESIN**Recommended use** : coating**Company** : PPG Coatings SPRL/BVBA
Noordersingel 23
B-2040 Borgerhout**Telephone** : +32 3 3606470**Telefax** : +32 3 3606435**Emergency telephone number** : +31 20 4075210**E-mail address** : PMC.Safety@PPG.com**2. HAZARDS IDENTIFICATION****Symbol(s) :**

|| Irritant

Hazardous components :

reaction product, mixed diamid wax

R-phrases(s) :

|| FLAMMABLE.

|| MAY CAUSE SENSITIZATION BY SKIN CONTACT.

|| HARMFUL TO AQUATIC ORGANISMS, MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT.

|| VAPOURS MAY CAUSE DROWSINESS AND DIZZINESS.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	EC No.	CAS-No.	DSD	Note	Classification	Concentration
n-butyl acetate	204-658-1	123-86-4	25th		R10 R66 R67	>=15.00 - <20.00%
1,2,3,4-tetrahydronaphthalene	204-340-2	119-64-2	24th		R19 Xi; R36/38 N; R51, R53	>=0.10 - <1.00%
xylene	215-535-7	1330-20-7	25th	Nota C	R10 Xn; R20/21 Xi; R38	>=2.50 - <10.00%
ethylbenzene	202-849-4	100-41-4	19th		F; R11 Xn; R20	>=1.00 - <2.50%

SAFETY DATA SHEET

This Safety Data Sheet is prepared in accordance with Annex II to Regulation (EC) No. 1907/2006.



PPG Protective & Marine Coatings

AMERSHIELD RESIN

MSDS EU 01 / EN Version 3

Print Date 6/7/2010

Revision date 28-06-09

2-methoxy-1-methylethyl acetate	203-603-9	108-65-6	19th		R10 Xi; R36	>=1.00 - <2.50%
Bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate	255-437-1	41556-26-7			N; R50/53 R43	>=0.25 - <1.00%
Methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate	280-060-4	82919-37-7			N; R50/53 R43	>=0.10 - <0.25%
reaction product, mixed diamid wax					R43 R53	>=1.00 - <2.50%

Producer declares that for R-phrases not mentioned in chapters 3, the entire amount of hazardous substances is below limits. For components with an occupational threshold limit value see chapter 8.

If multiple components with identical identifiers appear, these have different hazardous properties, e.g. flashpoint.

4. FIRST AID MEASURES

- General advice** : When symptoms persist or in all cases of doubt seek medical advice. Never give anything by mouth to an unconscious person.
- Eye contact** : Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart. Remove contact lenses. Seek medical advice.
- Skin contact** : Take off all contaminated clothing immediately. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.
- Inhalation** : Remove to fresh air. Keep patient warm and at rest. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position and seek medical advice.
- Ingestion** : If accidentally swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.
- Burns** : If spills on clothing catch fire, wash with plenty of water. Remove loose clothing. Do not remove clothing that has melted to the skin. Obtain medical attention.

5. FIRE-FIGHTING MEASURES

- Specific hazards during fire fighting** : As the product contains combustible organic components, fire will produce dense black smoke containing hazardous products of combustion (see section 10). Exposure to decomposition products may be a hazard to health. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.
- Special protective equipment for fire-fighters** : In the event of fire, wear self-contained breathing apparatus.
- Suitable extinguishing media** : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Keep containers and surroundings cool with water spray.
- Extinguishing media which shall not be used for safety reasons** : Do NOT use water jet.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions** : Use personal protective equipment. Ventilate the area. Refer to protective measures listed in sections 7 and 8. Wear respiratory protection. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. Remove all sources of ignition.

**AMERSHIELD RESIN**

MSDS EU 01 / EN Version 3

Print Date 6/7/2010

Revision date 28-06-09

- Environmental precautions** : Try to prevent the material from entering drains or water ways. If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods for cleaning up** : Clean with detergents. Avoid solvents. Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
- Additional advice** : Refer to section 15 for specific national regulation.

7. HANDLING AND STORAGE**Handling**

- Safe handling advice** : Avoid exceeding of the given occupational exposure limits (see section 8). Use only in area provided with appropriate exhaust ventilation. Avoid contact with skin, eyes and clothing. Smoking, eating and drinking should be prohibited in the application area. Avoid inhalation of vapour or mist. For personal protection see section 8.
- Advice on protection against fire and explosion** : Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. When transferring from one container to another apply earthing measures and use conductive hose material. No sparking tools should be used. Operators should wear anti-static footwear and clothing and floors should be of the conducting type. Isolate from sources of heat, sparks and open flame. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. No smoking. The accumulation of contaminated rags and dry overspray, particularly in spray booth filters, may result in spontaneous combustion. Good housekeeping standards, regular safe removal of waste materials and regular maintenance of spray booth filters will minimise the risks of spontaneous combustion and other fire hazards.

Storage

- Requirements for storage areas and containers** : Observe label precautions. Prevent unauthorized access. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store between 5 and 30°C (41 - 86 F) in a dry, well ventilated place away from sources of heat, ignition and direct sunlight. Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Electrical installations / working materials must comply with the technological safety standards. Keep away from sources of ignition - No smoking. Store in accordance with the particular national regulations (see section 15).
- Advice on common storage** : Keep away from oxidising agents and strongly acid or alkaline materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components on the national list and/or the European TLV list (98/24/EC):**

Components	CAS-No.	Value [mg/m ³]	Value [ppm]	Basis

**AMERSHIELD RESIN**

MSDS EU 01 / EN Version 3

Print Date 6/7/2010

Revision date 28-06-09

xylene <i>can be absorbed through skin</i>	1330-20-7	221 442	50 100	EU ELV TWA EU ELV STEL
ethylbenzene <i>can be absorbed through skin</i>	100-41-4	442 884	100 200	EU ELV TWA EU ELV STEL
2-methoxy-1-methylethyl acetate <i>can be absorbed through skin</i>	108-65-6	275 550	50 100	EU ELV TWA EU ELV STEL

Personal protective equipment**General advice****Respiratory protection**

: When operators, whether spraying or not, have to work inside the spray booth, ventilation is unlikely to be sufficient to control particulates and solvent vapour in all cases. In such circumstances they should wear a compressed air-fed respirator during the spraying process and until such time as the particulates and solvent vapour concentration has fallen below the exposure limits.

Hand protection

: For prolonged or repeated contact use protective gloves. Barrier creams may help to protect the exposed areas of skin, they should however not be applied once exposure has occurred. Skin should be washed after contact. Use chemical resistant gloves classified under Standard EN 374: Protective gloves against chemicals and micro-organisms.

Recommended gloves: Nitrile rubber
Minimum breakthrough time: 30 min

The recommended gloves are based on most common solvent in this product.

When prolonged or frequently repeated contact may occur, a glove with a protection class of 6 (breakthrough time greater than 480 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 2 or higher (breakthrough time greater than 30 minutes according to EN 374) is recommended.

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection

: Chemical resistant goggles must be worn.

Skin and body protection

: Personnel should wear protective clothing. Skin should be washed after contact. Working clothes must not consist of textiles, which show a dangerous melting behaviour in case of fire. Workers should wear antistatic footwear.

Additional advice**Environmental protection**

: Refer to national regulations in chapter 15 for regulations on environmental protection.

Personal protection

AMERSHIELD RESIN

MSDS EU 01 / EN Version 3

Print Date 6/7/2010
Revision date 28-06-09**Protective equipment** : Eye protection, safety gloves and combi mask P1A1*Please contact your personal protection equipment supplier for further advice***9. PHYSICAL AND CHEMICAL PROPERTIES**

Form	:	viscous
Colour	:	various
Odour	:	aromatic strong
Flash point	:	26.0 °C
Autoignition temperature	:	
Upper explosion limit	:	7.48 %(V) 355.9 g/m ³
Lower explosion limit	:	1.24 %(V) 58.71 g/m ³
Density	:	1.42 g/cm ³ at 20 °C
Water solubility	:	no data available
pH	:	
Viscosity, dynamic	:	12,000 mPa.s at 23 °C
Flow time	:	>= 60 s Transversal section: 6 mm Method: ISO 2431 (EN 535) 6 mm CUP

10. STABILITY AND REACTIVITY

Conditions to avoid	:	Avoid temperatures above 60°C (140 F), direct sunlight and contact with sources of heat.
Hazardous reactions	:	Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions.
Hazardous decomposition products	:	In case of fire hazardous decomposition products may be produced such as: Carbon dioxide (CO ₂), carbon monoxide (CO), oxides of nitrogen (NO _x), dense black smoke.

11. TOXICOLOGICAL INFORMATION

Product information	:	There is no data available for this product. The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and classified for toxicological hazards accordingly. See Sections 3 and 15 for details.
Acute oral toxicity	:	May cause nausea, abdominal spasms and irritation of the mucous membranes.

**AMERSHIELD RESIN**

MSDS EU 01 / EN Version 3

Print Date 6/7/2010
Revision date 28-06-09

- Acute inhalation toxicity** : Exposure to component solvent vapours concentration in excess of the stated occupational exposure limit may result in adverse health effects. Such as: mucous membrane irritation, respiratory system irritation, adverse effects on kidney, liver and central nervous system. Symptoms and signs: headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases loss of consciousness.
- Skin irritation** : Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in desiccation of the skin. The product may be absorbed through the skin.
- Eye contact** : The liquid splashed in the eyes may cause irritation and reversible damage.
- Further information** : There is no data available for this product.

Acute Toxicity Data for Components**12. ECOLOGICAL INFORMATION**

- Further information** : No data is available on the product itself. The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is classified for ecotoxicological properties accordingly. See sections 3 and 15 for details. The product should not be allowed to enter drains, water courses or the soil.

13. DISPOSAL CONSIDERATIONS

- Product** : The product should not be allowed to enter drains, water courses or the soil. Disposal together with normal waste is not allowed. Special disposal required according to local regulations.
- Waste key for the unused product** : The European Waste Catalogue classification of this product, when disposed of as waste is:
- 08 01 11 Waste paint and varnish containing organic solvents or other dangerous substances.
- If this product is fully cured or mixed with other wastes, this code may no longer apply. If mixed with other wastes, the appropriate code should be assigned. For further information contact your local waste authority

14. TRANSPORT INFORMATION

Transport within user's premises: always transport in closed containers that are upright, labelled and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport to be in accordance with ADR for road, IMDG for sea and IATA for air transport:

UN-Number : 1263
 Proper shipping name : PAINT
 Class : 3
 Packing group : III
 Label : 3
 Proper shipping name (ADR) : PAINT

Marine Pollutant (IMDG) : -
 EmS (IMDG) : F-E, S-E

AMERSHIELD RESIN

MSDS EU 01 / EN Version 3

Print Date 6/7/2010
Revision date 28-06-09

Limited quantity (ADR)	:	Max. per inner pack. : 5.00 L
		Max. per outer pack. : 30.00 KG
Limited quantity (IMDG)	:	Max. per inner pack. : 5.00 L
		Max. per outer pack. : 30.00 KG

Note

ADR: If pack sizes less than 450L, under the terms of 2.2.3.1.5, this product is not subject to the provisions of ADR.

IMDG: If pack sizes up to and including 30L, under the terms of 2.3.2.5, this product is not subject to the packaging, labelling and marking requirements of the IMDG code, but both full documentation and placarding of cargo transport units is still required.

15. REGULATORY INFORMATION

The product is classified and labelled in accordance with Directive 1999/45/EC.

**Irritant****Hazardous components which must be listed on the label:**

- reaction product, mixed diamid wax

R-phrases)	:	R10	Flammable.
		R43	May cause sensitization by skin contact.
		R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
		R67	Vapours may cause drowsiness and dizziness.

S-phrases)	:	S23	Do not breathe spray.
		S36/37	Wear suitable protective clothing and gloves.
		S38	In case of insufficient ventilation, wear suitable respiratory equipment.
		S61	Avoid release to the environment. Refer to special instructions/ Safety data sheets.

The information contained in this safety data sheet does not constitute the user's own assessment of workplace risks, as required by other health and safety legislation. The provisions of the national health and safety at work regulations apply to the use of this product at work.

National legislation

AMERSHIELD RESIN

MSDS EU 01 / EN Version 3

Print Date 6/7/2010

Revision date 28-06-09

16. OTHER INFORMATION**Explanation of R-phrases mentioned in section 3**

n-butyl acetate	R10 R66 R67	Flammable. Repeated exposure may cause skin dryness or cracking. Vapours may cause drowsiness and dizziness.
1,2,3,4-tetrahydronaphthalene	R19 R36/38 R51/53	May form explosive peroxides. Irritating to eyes and skin. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
xylene	R10 R20/21 R38	Flammable. Harmful by inhalation and in contact with skin. Irritating to skin.
ethylbenzene	R11 R20	Highly flammable. Harmful by inhalation.
2-methoxy-1-methylethyl acetate	R10 R36	Flammable. Irritating to eyes.
Bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate	R43 R50/53	May cause sensitization by skin contact. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate	R43 R50/53	May cause sensitization by skin contact. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
reaction product, mixed diamid wax	R43 R53	May cause sensitization by skin contact. May cause long-term adverse effects in the aquatic environment.

This Safety Data Sheet is based on the Safety Data Sheets obtained from the producer/manufacturer or/and internet databases and valid regulations considering hazardous substances/preparations.

Training advice:

Persons taking part in a turnover of hazardous products ought to be trained in product handling, safety and hygiene.

Drivers ought to be trained and obtain a certificate in accordance with the requirements of transport regulations (ADR).

Version: 3

Revision date 28.06.2009

The information contained in this safety data sheet is based on the present state of knowledge and current European and National legislation at the date of issue. The supplier reserves the right to modify data on the safety data sheet without further notice. Any change in data will normally be followed by the issue of a new safety data sheet. The user should check the date of issue and if more than 12 months have elapsed, then the data should only be used after checking with the nearest sales office of the supplier to establish that the data is still valid. As the specific conditions of use of the product are outside the suppliers control, the supplier is not responsible for the (negative) consequences of these specific conditions of use, which are outside of the suppliers control and which are not compliant with the handling, storage and other instructions in this safety data sheet.

After all component(s) stated on the relevant Technical Data Sheet have been mixed the safety precautions mentioned on each of the component(s) safety data sheets and labels should be used in assessing the safety precautions of the mixed product.

SAFETY DATA SHEET

This Safety Data Sheet is prepared in accordance with Annex II to Regulation (EC) No. 1907/2006.

PPG Protective &
Marine Coatings**AMERSHIELD CURE**

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 25-03-09**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING****Product information**

Trade name : AMERSHIELD CURE

Recommended use : coating

Company : PPG Coatings SPRL/BVBA
Noordersingel 23
B-2040 Borgerhout

Telephone : +32 3 3606470

Telefax : +32 3 3606435

Emergency telephone number : +31 20 4075210

E-mail address : PMC.Safety@PPG.com

2. HAZARDS IDENTIFICATION

Symbol(s) :
Irritant

Hazardous components :
isocyanic acid, hexamethylene ester, polymers

R-phrases(s) :
MAY CAUSE SENSITIZATION BY SKIN CONTACT.
HARMFUL TO AQUATIC ORGANISMS, MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT.

P-phrases(s) :
Contains isocyanates. See information supplied by the manufacturer.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	EC No.	CAS-No.	DSD	Note	Classification	Concentration
n-butyl acetate	204-658-1	123-86-4	25th		R10 R66 R67	>=2.50 - <10.00%
Solvent naphtha (petroleum), light arom.	265-199-0	64742-95-6		Nota H, Nota P	R10 N; R51/53 Xn; R65 Xi; R37 R66 R67	>=2.50 - <10.00%

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PPG Protective &
Marine Coatings

AMERSHIELD CURE

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 25-03-09

hexamethylene diisocyanate	212-485-8	822-06-0	19th		T; R23 Xi; R36/37/38 R42/43	>=0.10 - <0.50%
isocyanic acid, hexamethylene ester, polymers		28182-81-2			R43	>=75.00 - <100.00%

Producer declares that for R-phrases not mentioned in chapters 3, the entire amount of hazardous substances is below limits. For components with an occupational threshold limit value see chapter 8. The benzene content of this product is less than 0.1%. Nota P and H apply.

If multiple components with identical identifiers appear, these have different hazardous properties, e.g. flashpoint.

4. FIRST AID MEASURES

- General advice** : When symptoms persist or in all cases of doubt seek medical advice. Never give anything by mouth to an unconscious person.
- Eye contact** : Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart. Remove contact lenses. Seek medical advice.
- Skin contact** : Take off all contaminated clothing immediately. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.
- Inhalation** : Remove to fresh air. Keep patient warm and at rest. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position and seek medical advice.
- Ingestion** : If accidentally swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.
- Burns** : If spills on clothing catch fire, wash with plenty of water. Remove loose clothing. Do not remove clothing that has melted to the skin. Obtain medical attention.

5. FIRE-FIGHTING MEASURES

- Specific hazards during fire fighting** : As the product contains combustible organic components, fire will produce dense black smoke containing hazardous products of combustion (see section 10). Exposure to decomposition products may be a hazard to health. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.
- Special protective equipment for fire-fighters** : In the event of fire, wear self-contained breathing apparatus.
- Suitable extinguishing media** : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Keep containers and surroundings cool with water spray.
- Extinguishing media which shall not be used for safety reasons** : Do NOT use water jet.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions** : Use personal protective equipment. Ventilate the area. Refer to protective measures listed in sections 7 and 8. Wear respiratory protection. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. Remove all sources of ignition.
- Environmental precautions** : Try to prevent the material from entering drains or water ways. If the product contaminates rivers and lakes or drains inform respective authorities.

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PPG Protective & Marine Coatings

AMERSHIELD CURE

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 25-03-09

- Methods for cleaning up** : Clean with detergents. Avoid solvents. Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
- Additional advice** : Refer to section 15 for specific national regulation.

7. HANDLING AND STORAGE

Handling

- Safe handling advice** : Avoid exceeding of the given occupational exposure limits (see section 8). Use only in area provided with appropriate exhaust ventilation. Avoid contact with skin, eyes and clothing. Smoking, eating and drinking should be prohibited in the application area. Avoid inhalation of vapour or mist. For personal protection see section 8. Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this preparation is being used.

- Advice on protection against fire and explosion** : Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. When transferring from one container to another apply earthing measures and use conductive hose material. No sparking tools should be used. Operators should wear anti-static footwear and clothing and floors should be of the conducting type. Isolate from sources of heat, sparks and open flame. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. No smoking. The accumulation of contaminated rags and dry overspray, particularly in spray booth filters, may result in spontaneous combustion. Good housekeeping standards, regular safe removal of waste materials and regular maintenance of spray booth filters will minimise the risks of spontaneous combustion and other fire hazards.

Storage

- Requirements for storage areas and containers** : Observe label precautions. Prevent unauthorized access. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store between 5 and 30°C (41 - 86 F) in a dry, well ventilated place away from sources of heat, ignition and direct sunlight. Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Electrical installations / working materials must comply with the technological safety standards. Keep away from sources of ignition - No smoking. Store in accordance with the particular national regulations (see section 15).

- Advice on common storage** : Keep away from oxidising agents, strongly acid or alkaline materials, as well as of amines, alcohols and water.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components on the national list and/or the European TLV list (98/24/EC):

Components	CAS-No.	Value [mg/m ³]	Value [ppm]	Basis
Solvent naphtha (petroleum), light arom.	64742-95-6	125		ESIG TWA

Personal protective equipment

General advice

AMERSHIELD CURE

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 25-03-09**Respiratory protection**

- : When operators, whether spraying or not, have to work inside the spray booth, ventilation is unlikely to be sufficient to control particulates and solvent vapour in all cases. In such circumstances they should wear a compressed air-fed respirator during the spraying process and until such time as the particulates and solvent vapour concentration has fallen below the exposure limits. Under cool dry conditions, it is possible for the isocyanate to remain unreacted in the paint film for up to 30 hours after application. If dry flatting is unavoidable air fed respiratory protective equipment should be used.

Hand protection

- : For prolonged or repeated contact use protective gloves. Barrier creams may help to protect the exposed areas of skin, they should however not be applied once exposure has occurred. Skin should be washed after contact. Use chemical resistant gloves classified under Standard EN 374: Protective gloves against chemicals and micro-organisms.

Recommended gloves: Nitrile rubber
Minimum breakthrough time: 30 min

The recommended gloves are based on most common solvent in this product.

When prolonged or frequently repeated contact may occur, a glove with a protection class of 6 (breakthrough time greater than 480 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 2 or higher (breakthrough time greater than 30 minutes according to EN 374) is recommended.

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection

- : Chemical resistant goggles must be worn.

Skin and body protection

- : Personnel should wear protective clothing. Skin should be washed after contact. Working clothes must not consist of textiles, which show a dangerous melting behaviour in case of fire. Workers should wear antistatic footwear.

Additional advice**Environmental protection**

- : Refer to national regulations in chapter 15 for regulations on environmental protection.

Personal protection**Protective equipment**

- : Eye protection, safety gloves and combi mask P1A1



Please contact your personal protection equipment supplier for further advice

9. PHYSICAL AND CHEMICAL PROPERTIES

- Form** : viscous
- Colour** : various
- Odour** : slight aromatic

SAFETY DATA SHEET

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**PPG Protective & Marine Coatings****AMERSHIELD CURE**

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 25-03-09

Flash point	:	55.7 °C
Autoignition temperature	:	>370 °C
Upper explosion limit	:	7.24 %(V) 360.89 g/m3
Lower explosion limit	:	1.02 %(V) 51.09 g/m3
Density	:	1.13 g/cm3 at 20 °C
Water solubility	:	partly soluble
pH	:	
Viscosity, dynamic	:	650 mPa.s at 23 °C
Flow time	:	>= 60 s Transversal section: 6 mm Method: ISO 2431 (EN 535) 6 mm CUP

10. STABILITY AND REACTIVITY

Conditions to avoid	:	Avoid temperatures above 60°C (140 F), direct sunlight and contact with sources of heat.
Hazardous reactions	:	Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions. Avoid moisture. Amines and alcohols cause exothermic reactions. Preparation reacts slowly with water resulting in evolution of CO2. Evolution of CO2 in closed containers causes overpressure and produces a risk of bursting.
Hazardous decomposition products	:	In case of fire hazardous decomposition products may be produced such as: Carbon dioxide (CO2), carbon monoxide (CO), oxides of nitrogen (NOx), dense black smoke.

11. TOXICOLOGICAL INFORMATION

Product information	:	There is no data available for this product. The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and classified for toxicological hazards accordingly. See Sections 3 and 15 for details.
Acute oral toxicity	:	May cause nausea, abdominal spasms and irritation of the mucous membranes.
Acute inhalation toxicity	:	Exposure to component solvent vapours concentration in excess of the stated occupational exposure limit may result in adverse health effects. Such as: mucous membrane irritation, respiratory system irritation, adverse effects on kidney, liver and central nervous system. Symptoms and signs: headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases loss of consciousness. Isocyanates may cause acute irritation and/or sensitisation of the respiratory system leading to tightness of the chest, wheeziness and an asthmatic condition.
Skin irritation	:	Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in desiccation of the skin. The product may be absorbed through the skin.
Eye contact	:	The liquid splashed in the eyes may cause irritation and reversible damage.
Further information	:	There is no data available for this product.

SAFETY DATA SHEET

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**PPG Protective & Marine Coatings****AMERSHIELD CURE**

MSDS EU 01 / EN Version 2

Print Date 6/2/2010

Revision date 25-03-09

Acute Toxicity Data for Components

hexamethylene diisocyanate(822-06-0)

Acute oral toxicity	:	LD50: 746 mg/kg (rat)
Acute inhalation toxicity	:	LC50: 0.15 mg/l (rat, 4 h)
Acute dermal toxicity	:	LD50: 599 mg/kg (rabbit,)

12. ECOLOGICAL INFORMATION

Further information : The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is classified for ecotoxicological properties accordingly. See sections 3 and 15 for details.

13. DISPOSAL CONSIDERATIONS

Product : The product should not be allowed to enter drains, water courses or the soil. Disposal together with normal waste is not allowed. Special disposal required according to local regulations.

Waste key for the unused product : The European Waste Catalogue classification of this product, when disposed of as waste is:

08 01 11 Waste paint and varnish containing organic solvents or other dangerous substances.

If this product is fully cured or mixed with other wastes, this code may no longer apply. If mixed with other wastes, the appropriate code should be assigned. For further information contact your local waste authority

14. TRANSPORT INFORMATION

Transport within user's premises: always transport in closed containers that are upright, labelled and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport to be in accordance with ADR for road, IMDG for sea and IATA for air transport:

UN-Number	:	1263
Proper shipping name	:	PAINT RELATED MATERIAL
Class	:	3
Packing group	:	III
Label	:	3
Proper shipping name (ADR)	:	PAINT RELATED MATERIAL

Marine Pollutant (IMDG)	:	-
EmS (IMDG)	:	F-E, S-E

Limited quantity (ADR)	:	Max. per inner pack. : 5.00 L
	:	Max. per outer pack. : 30.00 KG

Limited quantity (IMDG)	:	Max. per inner pack. : 5.00 L
	:	Max. per outer pack. : 30.00 KG

**AMERSHIELD CURE**

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 25-03-09**15. REGULATORY INFORMATION**

The product is classified and labelled in accordance with Directive 1999/45/EC.

**Irritant****Hazardous components which must be listed on the label:**

- isocyanic acid, hexamethylene ester, polymers

R-phrase(s)	: R43 R52/53	May cause sensitization by skin contact. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S-phrase(s)	: S23 S36/37 S38 S61	Do not breathe spray. Wear suitable protective clothing and gloves. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid release to the environment. Refer to special instructions/ Safety data sheets.
P-phrase(s)	:	Contains isocyanates. See information supplied by the manufacturer.

The information contained in this safety data sheet does not constitute the user's own assessment of workplace risks, as required by other health and safety legislation. The provisions of the national health and safety at work regulations apply to the use of this product at work.

National legislation**16. OTHER INFORMATION**

This product contains a complex mixture of hydrocarbons. Detailed information can be obtained from the producer.

Explanation of R-phrases mentioned in section 3

n-butyl acetate	R10	Flammable.
	R66	Repeated exposure may cause skin dryness or cracking.
	R67	Vapours may cause drowsiness and dizziness.

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PPG Protective & Marine Coatings

AMERSHIELD CURE

MSDS EU 01 / EN Version 2

Print Date 6/2/2010
Revision date 25-03-09

Solvent naphtha (petroleum), light arom.	R10	Flammable.
	R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	R65	Harmful: may cause lung damage if swallowed.
	R37	Irritating to respiratory system.
	R66	Repeated exposure may cause skin dryness or cracking.
hexamethylene diisocyanate	R67	Vapours may cause drowsiness and dizziness.
	R23	Toxic by inhalation.
	R36/37/38	Irritating to eyes, respiratory system and skin.
	R42/43	May cause sensitization by inhalation and skin contact.
isocyanic acid, hexamethylene ester, polymers	R43	May cause sensitization by skin contact.

This Safety Data Sheet is based on the Safety Data Sheets obtained from the producer/manufacturer or/and internet databases and valid regulations considering hazardous substances/preparations.

Training advice:

Persons taking part in a turnover of hazardous products ought to be trained in product handling, safety and hygiene.

Drivers ought to be trained and obtain a certificate in accordance with the requirements of transport regulations (ADR).

Version: 2

Revision date 25.03.2009

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After all component(s) stated on the relevant Technical Data Sheet have been mixed the safety precautions mentioned on each of the component(s) safety data sheets and labels should be used in assessing the safety precautions of the mixed product.

Hempadur 15570

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Regulation (EU) No. 2015/830 - Europe

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : HEMPADUR 15579
Product identity : 1557911150
Product type : epoxy primer (base for multi-component product)

1.2 Relevant identified uses of the substance or mixture and uses advised against

Field of application : buildings and metal industry. ships and shipyards.
Ready-for-use mixture : 15570 = 15579 3 vol. / 95570 1 vol.
15571 = 15579 4 vol. / 95040 1 vol.
Identified uses : Consumer applications, Industrial applications, Used by spraying.

1.3 Details of the supplier of the safety data sheet

Company details : HEMPEL A/S
Lundtoftegårdsvej 91
DK-2800 Kgs. Lyngby
Denmark
Tel.: + 45 45 93 38 00
hempel@hempel.com
Date of issue : 10 February 2016
Date of previous issue : 11 December 2014.

1.4 Emergency telephone number

Emergency telephone number (with hours of operation)

+45 45 93 38 00 (08.00 - 17.00)
See section 4 First aid measures.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Flam. Liq. 3, H226	FLAMMABLE LIQUIDS - Category 3
Acute Tox. 4, H332	ACUTE TOXICITY (inhalation) - Category 4
Skin Irrit. 2, H315	SKIN CORROSION/IRRITATION - Category 2
Eye Dam. 1, H318	SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
Skin Sens. 1, H317	SKIN SENSITIZATION - Category 1

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :



Signal word : Danger
Hazard statements : H226 - Flammable liquid and vapor.
H332 - Harmful if inhaled.
H318 - Causes serious eye damage.
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.

Precautionary statements :

General : If medical advice is needed, have product container or label at hand. Keep out of reach of children.
Prevention : Avoid breathing vapors, spray or mists. Wear protective gloves/protective clothing/eye protection/face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Response : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
Storage : Keep cool.
Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

SECTION 2: Hazards identification

Hazardous ingredients : ylene
middle molecular epoxy resin MMW 700-1200
ethylbenzene
n-butanol
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene

Supplemental label elements : Contains epoxy constituents. May produce an allergic reaction.

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : es, applicable.

2.3 Other hazards

Other hazards which do not result in classification : None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type
<input checked="" type="checkbox"/> ylene	REACH #: 01-2119488216-32 EC: 215-535-7 CAS: 1330-20-7 Index: 601-022-00-9	≥10 - ≤25	Flam. Liq. 3, H226 Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Irrit. 2, H315	C [1] [2]
middle molecular epoxy resin MMW 700-1200	EC: 500-033-5 CAS: *25068-38-6	≥10 - ≤25	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317 Flam. Liq. 2, H225	- [1]
ethylbenzene	REACH #: 01-2119489370-35 EC: 202-849-4 CAS: 100-41-4 Index: 601-023-00-4	≥3 - ≤5	Acute Tox. 4, H332 STOT RE 2, H373 (hearing organs) Asp. Tox. 1, H304	- [1] [2]
n-butanol	REACH #: 01-2119484630-38 EC: 200-751-6 CAS: 71-36-3 Index: 603-004-00-6	≥3 - ≤5	Flam. Liq. 3, H226 Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 STOT SE 3, H335 STOT SE 3, H336	- [1]
n-butyl acetate	REACH #: 01-2119485493-29 EC: 204-658-1 CAS: 123-86-4 Index: 607-025-00-1	≥1 - ≤3	Flam. Liq. 3, H226 STOT SE 3, H336 EUH066	- [1]
See Section 16 for the full text of the H statements declared above.				

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Type

- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit, see section 8.
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [5] Substance of equivalent concern

SECTION 4: First aid measures

4.1 Description of first aid measures

General : In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.
If breathing is irregular, drowsiness, loss of consciousness or cramps: Call 112 and give immediate treatment (first aid).

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek immediate medical attention.

Inhalation : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Give nothing by mouth. If unconscious, place in recovery position and get medical attention immediately.

Skin contact : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.

SECTION 4: First aid measures

Ingestion :	If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do not induce vomiting unless directed to do so by medical personnel. Lower the head so that vomit will not re-enter the mouth and throat.
Protection of first-aiders :	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact :	Causes serious eye damage.
Inhalation :	 Harmful if inhaled.
Skin contact :	Causes skin irritation. May cause an allergic skin reaction.
Ingestion :	 No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact :	Adverse symptoms may include the following: pain watering redness
Inhalation :	No specific data.
Skin contact :	Adverse symptoms may include the following: pain or irritation redness blistering may occur
Ingestion :	Adverse symptoms may include the following: stomach pains

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician :	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments :	No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Extinguishing media :	Recommended: alcohol resistant foam, CO ₂ , powders, water spray. Not to be used: waterjet.
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5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture :	Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.
Hazardous combustion products :	Decomposition products may include the following materials: carbon oxides halogenated compounds metal oxide/oxides

5.3 Advice for firefighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard. Cool closed containers exposed to fire with water. Do not release runoff from fire to drains or watercourses. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid all direct contact with the spilled material. Exclude sources of ignition and be aware of explosion hazard. Ventilate the area. Avoid breathing vapor or mist. Refer to protective measures listed in sections 7 and 8. No action shall be taken involving any personal risk or without suitable training. If the product contaminates lakes, rivers, or sewers, inform the appropriate authorities in accordance with local regulations.

6.2 Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and materials for containment and cleaning up

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Use spark-proof tools and explosion-proof equipment. Contaminated absorbent material may pose the same hazard as the spilled product.

6.4 Reference to other sections

See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Vapors are heavier than air and may spread along floors. Vapors may form explosive mixtures with air. Prevent the creation of flammable or explosive concentrations of vapors in air and avoid vapor concentrations higher than the occupational exposure limits. In addition, the product should be used only in areas from which all naked lights and other sources of ignition have been excluded. Electrical equipment should be protected to the appropriate standard. To dissipate static electricity during transfer, ground drum and connect to receiving container with bonding strap. No sparking tools should be used. Contains epoxy constituents. Avoid all possible skin contact with epoxy and amine containing products, they may cause allergic reactions.

Avoid inhalation of vapour, dust and spray mist. Avoid contact with skin and eyes. Eating, drinking and smoking should be prohibited in area where this material is handled, stored and processed. Appropriate personal protective equipment: see Section 8. Always keep in containers made from the same material as the original one.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a cool, well-ventilated area away from incompatible materials and ignition sources. Keep out of the reach of children. Keep away from: Oxidizing agents, strong alkalis, strong acids. No smoking. Prevent unauthorized access. Containers that are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)

See separate Product Data Sheet for recommendations or industrial sector specific solutions.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Product/ingredient name	Exposure limit values
xylene	EU OEL (Europe, 12/2009). Absorbed through skin. STEL: 442 mg/m ³ 15 minutes. STEL: 100 ppm 15 minutes. TWA: 221 mg/m ³ 8 hours. TWA: 50 ppm 8 hours.
ethylbenzene	EU OEL (Europe, 12/2009). Absorbed through skin. STEL: 884 mg/m ³ 15 minutes. STEL: 200 ppm 15 minutes. TWA: 442 mg/m ³ 8 hours. TWA: 100 ppm 8 hours.

Recommended monitoring procedures

SECTION 8: Exposure controls/personal protection

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Derived effect levels

No DNELs/DMELs available.

Predicted effect concentrations

No PNECs available.

8.2 Exposure controls

Appropriate engineering controls

Arrange sufficient ventilation by local exhaust ventilation and good general ventilation to keep the airborne concentrations of vapors or dust lowest possible and below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the workstation location.

Individual protection measures

General :

Gloves must be worn for all work that may result in soiling. Apron/coveralls/protective clothing must be worn when soiling is so great that regular work clothes do not adequately protect skin against contact with the product. Safety eyewear should be used when there is a likelihood of exposure.



Hygiene measures :

Wash hands, forearms, and face thoroughly after handling compounds and before eating, smoking, using lavatory, and at the end of day.

Eye/face protection :

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection :

Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. The quality of the chemical-resistant protective gloves must be chosen as a function of the specific workplace concentrations and quantity of hazardous substances.

Since the actual work situation is unknown. Supplier of gloves should be contacted in order to find the appropriate type. Below listed glove(s) should be regarded as generic advice:

Recommended: Silver Shield / 4H gloves, polyvinyl alcohol (PVA), Viton®

May be used: nitrile rubber, neoprene rubber, butyl rubber

Short term exposure: natural rubber (latex), polyvinyl chloride (PVC)

Body protection :

Personal protective equipment for the body should be selected based on the task being performed and the risks involved handling this product.

Wear suitable protective clothing. Always wear protective clothing when spraying.

Respiratory protection :

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If working areas have insufficient ventilation: When the product is applied by means that will not generate an aerosol such as, brush or roller wear half or totally covering mask equipped with gas filter of type A, when grinding use particle filter of type P. Be sure to use an approved/certified respirator or equivalent.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state :	Liquid.
Odor :	Solvent-like
pH :	Testing not relevant or not possible due to nature of the product.
Melting point/freezing point :	Testing not relevant or not possible due to nature of the product.
Boiling point/boiling range :	Testing not relevant or not possible due to nature of the product.
Flash point :	Closed cup: 25°C (77°F)
Evaporation rate :	Testing not relevant or not possible due to nature of the product.
Flammability :	Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat. Flammable in the presence of the following materials or conditions: oxidizing materials.
Lower and upper explosive (flammable) limits :	0.8 - 11.3 vol %
Vapor pressure :	Testing not relevant or not possible due to nature of the product.
Vapor density :	Testing not relevant or not possible due to nature of the product.
Relative density :	1.389 g/cm ³
Solubility(ies) :	Partially soluble in the following materials: cold water and hot water.
Partition coefficient (LogKow) :	Testing not relevant or not possible due to nature of the product.
Auto-ignition temperature :	Lowest known value: 355°C (671°F) (n-butanol).
Decomposition temperature :	Testing not relevant or not possible due to nature of the product.
Viscosity :	Aspiration hazard (H304) Not classified. Testing not relevant due to nature of the product.
Explosive properties :	Highly explosive in the presence of the following materials or conditions: heat. Explosive in the presence of the following materials or conditions: open flames, sparks and static discharge.
Oxidizing properties :	Testing not relevant or not possible due to nature of the product.

9.2 Other information

Solvent(s) % by weight :	Weighted average: 31 %
Water % by weight :	Weighted average: 0 %
VOC content :	436 g/l
VOC content, Ready-for-use mixture :	413.1 g/l
TOC Content :	Weighted average: 375 g/l
Solvent Gas :	Weighted average: 0.103 m ³ /l

SECTION 10: Stability and reactivity

10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

The product is stable.

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

10.5 Incompatible materials

Highly reactive or incompatible with the following materials: oxidizing materials.
Reactive or incompatible with the following materials: reducing materials.

SECTION 10: Stability and reactivity

10.6 Hazardous decomposition products

When exposed to high temperatures (i.e. in case of fire) harmful decomposition products may be formed:

Decomposition products may include the following materials: carbon oxides halogenated compounds metal oxide/oxides

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Exposure to component solvent vapor concentrations may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Solvents may cause some of the above effects by absorption through the skin. Symptoms and signs include headaches, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, loss of consciousness. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin, resulting in non-allergic contact dermatitis and absorption through the skin. If splashed in the eyes, the liquid may cause irritation and reversible damage. Accidental swallowing may cause stomach pain. Chemical lung inflammation may occur if the product is taken into the lungs via vomiting.

Epoxy and amine containing products can cause skin disorders such as allergic eczema. The allergy may arise after only a short exposure period.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
xylene	LC50 Inhalation Gas.	Rat	5000 ppm	4 hours
	LC50 Inhalation Vapor	Rat	6350 ppm	4 hours
	LD50 Oral	Rat	4300 mg/kg	-
	LD50 Dermal	Rat	>2000 mg/kg	-
middle molecular epoxy resin MMW 700-1200				
ethylbenzene	LD50 Dermal	Rabbit	>5000 mg/kg	-
n-butanol	LD50 Oral	Rat	3500 mg/kg	-
	LC50 Inhalation Vapor	Rat	24000 mg/m ³	4 hours
	LD50 Dermal	Rabbit	3400 mg/kg	-
n-butyl acetate	LD50 Oral	Rat	790 mg/kg	-
	LC50 Inhalation Vapor	Rat	>21 mg/l	4 hours
	LD50 Dermal	Rabbit	>17600 mg/kg	-
	LD50 Oral	Rat	10768 mg/kg	-

Acute toxicity estimates

Route	ATE value
Oral	20428.7 mg/kg
Dermal	5207 mg/kg
Inhalation (gases)	19027.5 ppm
Inhalation (vapors)	42.7 mg/l

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure
xylene	Eyes - Severe irritant	Rabbit	-	24 hours 5 milligrams
	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams
ethylbenzene	Skin - Mild irritant	Rabbit	-	24 hours 15 milligrams
	Respiratory - Mild irritant	Rabbit	-	-
	Eyes - Mild irritant	Rabbit	-	-
n-butanol	Eyes - Severe irritant	Rabbit	-	24 hours 2 milligrams
	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams
n-butyl acetate	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams
	Eyes - Mild irritant	Rabbit	-	-
	Respiratory - Mild irritant	Rabbit	-	-

Sensitizer

Product/ingredient name	Route of exposure	Species	Result
middle molecular epoxy resin MMW 700-1200	skin	Guinea pig	Sensitizing

Mutagenic effects

 No known significant effects or critical hazards.

Carcinogenicity

 No known significant effects or critical hazards.

Reproductive toxicity

 No known significant effects or critical hazards.

Teratogenic effects

SECTION 11: Toxicological information

 No known significant effects or critical hazards.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
n-butanol	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
n-butyl acetate	Category 3	Not applicable.	Narcotic effects

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
 ethylbenzene	Category 2	Not determined	hearing organs

Aspiration hazard

Product/ingredient name	Result
ethylbenzene	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure

Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential chronic health effects

Sensitization : Contains middle molecular epoxy resin MMW 700-1200, 1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene. May produce an allergic reaction.

Other information : No additional known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Do not allow to enter drains or watercourses.

Product/ingredient name	Result	Species	Exposure
 middle molecular epoxy resin MMW 700-1200	Acute EC50 >100 mg/l	Daphnia	48 hours
ethylbenzene	Acute LC50 >100 mg/l	Fish	96 hours
n-butanol	Chronic NOEC <1000 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
n-butyl acetate	Acute EC50 1328 mg/l	Daphnia	96 hours
	Acute LC50 1.376 mg/l	Fish	96 hours
	Acute EC50 44 mg/l	Daphnia	48 hours

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
 xylene	-	>60 % - Readily - 28 days	-	-
ethylbenzene	-	>70 % - Readily - 28 days	-	-
n-butanol	OECD 301D Ready	92 % - 20 days	-	-
n-butyl acetate	Biodegradability - Closed Bottle Test	90 % - Readily - 28 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
 xylene	-	-	Readily
ethylbenzene	-	-	Readily
n-butanol	-	-	Readily
n-butyl acetate	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
 xylene	3.12	8.1 - 25.9	low
middle molecular epoxy resin MMW 700-1200	2.64 - 3.78	31	low
ethylbenzene	3.6	-	low
n-butanol	1	3.16	low
n-butyl acetate	2.3	-	low

12.4 Mobility in soil

SECTION 12: Ecological information

Soil/water partition coefficient (K_{oc}): No known data available in our database.
 Mobility: No known data available in our database.

12.5 Results of PBT and vPvB assessment

PBT: Not applicable.
 vPvB: Not applicable.

12.6 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

The generation of waste should be avoided or minimized wherever possible. Residues of the product is listed as hazardous waste. Dispose of according to all state and local applicable regulations. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Spillage, remains, discarded clothes and similar should be discarded in a fireproof container.

European waste catalogue no. (EWC) is given below.

European waste catalogue (EWC) : 08 01 11*

Packaging

The generation of waste should be avoided or minimized wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

SECTION 14: Transport information

Transport may take place according to national regulation or ADR for transport by road, RID for transport by train, IMDG for transport by sea, IATA for transport by air.

	14.1 UN no.	14.2 Proper shipping name	14.3 Transport hazard class(es)	14.4 PG*	14.5 Env*	Additional information
ADR/RID Class	UN1263	PAINT	3 	III	No.	Special provisions 640 (E) Tunnel code (D/E)
IMDG Class	UN1263	PAINT	3 	III	No.	Emergency schedules (EmS) F-E, S-E
IATA Class	UN1263	PAINT	3 	III	No.	-

PG* : Packing group

Env.* : Environmental hazards

14.6 Special precautions for user

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code

Not applicable.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH) Annex XIV - List of substances subject to authorization - Substances of very high concern

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

Other EU regulations

Seveso category This product is controlled under the Seveso III Directive.

Seveso category
P5c: Flammable liquids 2 and 3 not falling under P5a or P5b C6: Flammable (R10)

15.2 Chemical Safety Assessment

This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Abbreviations and acronyms :

ATE = Acute Toxicity Estimate
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 EUH statement = CLP-specific Hazard statement
 RRN = REACH Registration Number
 DNEL = Derived No Effect Level
 PNEC = Predicted No Effect Concentration

Full text of abbreviated H statements :

~~H~~225 Highly flammable liquid and vapor.
 H226 Flammable liquid and vapor.
 H302 Harmful if swallowed.
 H304 May be fatal if swallowed and enters airways.
 H312 Harmful in contact with skin.
 H315 Causes skin irritation.
 H317 May cause an allergic skin reaction.
 H318 Causes serious eye damage.
 H319 Causes serious eye irritation.
 H332 Harmful if inhaled.
 H335 May cause respiratory irritation.
 H336 May cause drowsiness or dizziness.
 H373 (hearing organs) May cause damage to organs through prolonged or repeated exposure. (hearing organs)

Full text of classifications [CLP/GHS] :

~~A~~cute Tox. 4, H302 ACUTE TOXICITY (oral) - Category 4
 Acute Tox. 4, H312 ACUTE TOXICITY (dermal) - Category 4
 Acute Tox. 4, H332 ACUTE TOXICITY (inhalation) - Category 4
 Asp. Tox. 1, H304 ASPIRATION HAZARD - Category 1
 EUH066 Repeated exposure may cause skin dryness or cracking.
 Eye Dam. 1, H318 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
 Eye Irrit. 2, H319 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
 Flam. Liq. 2, H225 FLAMMABLE LIQUIDS - Category 2
 Flam. Liq. 3, H226 FLAMMABLE LIQUIDS - Category 3
 Skin Irrit. 2, H315 SKIN CORROSION/IRRITATION - Category 2
 Skin Sens. 1, H317 SKIN SENSITIZATION - Category 1
 STOT RE 2, H373 (hearing organs) SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (hearing organs) - Category 2
 STOT SE 3, H335 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
 STOT SE 3, H336 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
F LAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1 SKIN SENSITIZATION - Category 1	On basis of test data Calculation method Calculation method Calculation method Calculation method

SECTION 16: Other information

Notice to reader

✔ Indicates information that has changed from previously issued version.

The information contained in this safety data sheet is based on the present state of knowledge and EU and national legislation. It provides guidance on health, safety and environmental aspects for handling the product in a safe way and should not be construed as any guarantee of the technical performance or suitability for particular applications.

It is always the duty of the user/employer to ascertain that the work is planned and carried out in accordance with the national regulations.

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Regulation (EU) No. 2015/830 - Europe

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : HEMPEL'S CURING AGENT 95570
Product identity : 9557000000
Product type : Curing agent

1.2 Relevant identified uses of the substance or mixture and uses advised against

Field of application : used only as part of two- or multi component products.
Ready-for-use mixture : (see base component)
Identified uses : Consumer applications, Industrial applications, Professional applications, Used by spraying.

1.3 Details of the supplier of the safety data sheet

Company details : HEMPEL A/S
Lundtoftegårdsvej 91
DK-2800 Kgs. Lyngby
Denmark
Tel.: + 45 45 93 38 00
hempel@hempel.com
Date of issue : 12 February 2016
Date of previous issue : 6 March 2015.

1.4 Emergency telephone number

Emergency telephone number (with hours of operation)

+45 45 93 38 00 (08.00 - 17.00)
See section 4 First aid measures.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Flam. Liq. 3, H226 FLAMMABLE LIQUIDS - Category 3
Skin Irrit. 2, H315 SKIN CORROSION/IRRITATION - Category 2
Eye Dam. 1, H318 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
Skin Sens. 1, H317 SKIN SENSITIZATION - Category 1
Aquatic Chronic 3, H412 AQUATIC HAZARD (LONG-TERM) - Category 3

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :



Signal word : Danger
Hazard statements : H226 - Flammable liquid and vapor.
H318 - Causes serious eye damage.
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.
H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements :

General : If medical advice is needed, have product container or label at hand. Keep out of reach of children.
Prevention : Avoid breathing vapors, spray or mists. Wear protective gloves/protective clothing/eye protection/face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Response : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
Storage : Keep cool.
Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazardous ingredients : Methylstyrenated phenol
n-butanol
2,4,6-tris(dimethylaminomethyl)phenol
triethylenetetramine

SECTION 2: Hazards identification

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : Not applicable.

2.3 Other hazards

Other hazards which do not result in classification : None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type
Methylstyrenated phenol	REACH #: 01-2119555274-38 EC: 270-966-8 CAS: 68512-30-1	≥10 - ≤25	Skin Irrit. 2, H315 Skin Sens. 1, H317 Aquatic Chronic 3, H412	- [1]
n-butanol	REACH #: 01-2119484630-38 EC: 200-751-6 CAS: 71-36-3 Index: 603-004-00-6	≥10 - ≤15	Flam. Liq. 3, H226 Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 STOT SE 3, H335 STOT SE 3, H336	- [1]
xylene	REACH #: 01-2119488216-32 EC: 215-535-7 CAS: 1330-20-7 Index: 601-022-00-9	≥10 - ≤20	Flam. Liq. 3, H226 Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Irrit. 2, H315	C [1] [2]
ethylbenzene	REACH #: 01-2119489370-35 EC: 202-849-4 CAS: 100-41-4 Index: 601-023-00-4	≥3 - ≤4.5	Flam. Liq. 2, H225 Acute Tox. 4, H332 STOT RE 2, H373 (hearing organs) Asp. Tox. 1, H304	- [1] [2]
2,4,6-tris(dimethylaminomethyl) phenol	REACH #: 01-2119560597-27 EC: 202-013-9 CAS: 90-72-2	≥3 - <5	Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412	- [1]
Fatty acids, tall-oil, compds. with (Z)-N-9-octadecenyl-1, 3-propanediamine (2:1)	EC: 295-184-4 CAS: 91845-13-5	≥1 - ≤2	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Acute 1, H400 (M=1)	- [1]
9-octadecenoic acid (z)-compd. with (z)-n-9-octadecenyl-1, 3-propanediamine	EC: 254-754-2 CAS: 40027-38-1	≥1 - ≤2	Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT RE 2, H373 (oral) Aquatic Acute 1, H400 (M=10) Aquatic Chronic 2, H411	- [1]
solvent naphtha (petroleum), light arom.	REACH #: 01-2119455851-35 EC: 265-199-0 CAS: 64742-95-6	≤1	Flam. Liq. 3, H226 STOT SE 3, H335 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411	P [1] [2]

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Type

- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit, see section 8.
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [5] Substance of equivalent concern

SECTION 4: First aid measures

4.1 Description of first aid measures

General :	In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person. If breathing is irregular, drowsiness, loss of consciousness or cramps: Call 112 and give immediate treatment (first aid).
Eye contact :	Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek immediate medical attention.
Inhalation :	Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Give nothing by mouth. If unconscious, place in recovery position and get medical attention immediately.
Skin contact :	Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.
Ingestion :	If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do not induce vomiting unless directed to do so by medical personnel. Lower the head so that vomit will not re-enter the mouth and throat.
Protection of first-aiders :	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact :	Causes serious eye damage.
Inhalation :	 No known significant effects or critical hazards.
Skin contact :	Causes skin irritation. May cause an allergic skin reaction.
Ingestion :	 No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact :	Adverse symptoms may include the following: pain watering redness
Inhalation :	No specific data.
Skin contact :	Adverse symptoms may include the following: pain or irritation redness blistering may occur
Ingestion :	Adverse symptoms may include the following: stomach pains

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician :	If gasses have been inhaled, from the decomposition of the product, symptoms may be delayed. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments :	No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Extinguishing media :	Recommended: alcohol resistant foam, CO ₂ , powders, water spray. Not to be used: waterjet.
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5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture :	Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
Hazardous combustion products :	Decomposition products may include the following materials: carbon oxides nitrogen oxides

5.3 Advice for firefighters

SECTION 5: Firefighting measures

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard. Cool closed containers exposed to fire with water. Do not release runoff from fire to drains or watercourses. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid all direct contact with the spilled material. Exclude sources of ignition and be aware of explosion hazard. Ventilate the area. Avoid breathing vapor or mist. Refer to protective measures listed in sections 7 and 8. No action shall be taken involving any personal risk or without suitable training. If the product contaminates lakes, rivers, or sewers, inform the appropriate authorities in accordance with local regulations.

6.2 Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material.

6.3 Methods and materials for containment and cleaning up

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Use spark-proof tools and explosion-proof equipment. Contaminated absorbent material may pose the same hazard as the spilled product.

6.4 Reference to other sections

See Section 1 for emergency contact information.
 See Section 8 for information on appropriate personal protective equipment.
 See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Vapors are heavier than air and may spread along floors. Vapors may form explosive mixtures with air. Prevent the creation of flammable or explosive concentrations of vapors in air and avoid vapor concentrations higher than the occupational exposure limits. In addition, the product should be used only in areas from which all naked lights and other sources of ignition have been excluded. Electrical equipment should be protected to the appropriate standard. To dissipate static electricity during transfer, ground drum and connect to receiving container with bonding strap. No sparking tools should be used. Avoid inhalation of vapour, dust and spray mist. Avoid contact with skin and eyes. Eating, drinking and smoking should be prohibited in area where this material is handled, stored and processed. Appropriate personal protective equipment: see Section 8. Always keep in containers made from the same material as the original one.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a cool, well-ventilated area away from incompatible materials and ignition sources. Keep out of the reach of children. Keep away from: Oxidizing agents, strong alkalis, strong acids. No smoking. Prevent unauthorized access. Containers that are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)

See separate Product Data Sheet for recommendations or industrial sector specific solutions.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Product/ingredient name	Exposure limit values
xylene ethylbenzene	<p>EU OEL (Europe, 12/2009). Absorbed through skin. STEL: 442 mg/m³ 15 minutes. STEL: 100 ppm 15 minutes. TWA: 221 mg/m³ 8 hours. TWA: 50 ppm 8 hours.</p> <p>EU OEL (Europe, 12/2009). Absorbed through skin. STEL: 884 mg/m³ 15 minutes. STEL: 200 ppm 15 minutes. TWA: 442 mg/m³ 8 hours. TWA: 100 ppm 8 hours.</p>

SECTION 8: Exposure controls/personal protection

solvent naphtha (petroleum), light arom.

EU OEL (Europe).

TWA: 120 mg/m³ 8 hours. Form:

TWA: 25 ppm 8 hours. Form:

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Derived effect levels

No DNELs/DMELs available.

Predicted effect concentrations

No PNECs available.

8.2 Exposure controls

Appropriate engineering controls

Arrange sufficient ventilation by local exhaust ventilation and good general ventilation to keep the airborne concentrations of vapors or dust lowest possible and below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the workstation location.

Individual protection measures

General :

Gloves must be worn for all work that may result in soiling. Apron/coveralls/protective clothing must be worn when soiling is so great that regular work clothes do not adequately protect skin against contact with the product. Safety eyewear should be used when there is a likelihood of exposure.



Hygiene measures :

Wash hands, forearms, and face thoroughly after handling compounds and before eating, smoking, using lavatory, and at the end of day.

Eye/face protection :

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection :

Wear chemical-resistant gloves (tested to EN374) in combination with 'basic' employee training. The quality of the chemical-resistant protective gloves must be chosen as a function of the specific workplace concentrations and quantity of hazardous substances.

Since the actual work situation is unknown. Supplier of gloves should be contacted in order to find the appropriate type. Below listed glove(s) should be regarded as generic advice:

Recommended: Silver Shield / 4H gloves, polyvinyl alcohol (PVA), Viton®

May be used: nitrile rubber, neoprene rubber, butyl rubber

Short term exposure: natural rubber (latex), polyvinyl chloride (PVC)

Body protection :

Personal protective equipment for the body should be selected based on the task being performed and the risks involved handling this product.

Wear suitable protective clothing. Always wear protective clothing when spraying.

Respiratory protection :

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If working areas have insufficient ventilation: When the product is applied by means that will not generate an aerosol such as, brush or roller wear half or totally covering mask equipped with gas filter of type A, when grinding use particle filter of type P. Be sure to use an approved/certified respirator or equivalent.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state :	Liquid.
Color :	Clear.
Odor :	Solvent-like
pH :	Testing not relevant or not possible due to nature of the product.
Melting point/freezing point :	Testing not relevant or not possible due to nature of the product.
Boiling point/boiling range :	Testing not relevant or not possible due to nature of the product.
Flash point :	Closed cup: 26°C (78.8°F)
Evaporation rate :	Testing not relevant or not possible due to nature of the product.
Flammability :	Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
Lower and upper explosive (flammable) limits :	0.8 - 11.3 vol %
Vapor pressure :	Testing not relevant or not possible due to nature of the product.
Vapor density :	Testing not relevant or not possible due to nature of the product.
Relative density :	0.949 g/cm ³
Solubility(ies) :	Partially soluble in the following materials: cold water and hot water.
Partition coefficient (LogKow) :	Testing not relevant or not possible due to nature of the product.
Auto-ignition temperature :	Lowest known value: 355°C (671°F) (n-butanol).
Decomposition temperature :	Testing not relevant or not possible due to nature of the product.
Viscosity :	Aspiration hazard (H304) Not classified. Testing not relevant due to nature of the product.
Explosive properties :	Highly explosive in the presence of the following materials or conditions: heat. Explosive in the presence of the following materials or conditions: open flames, sparks and static discharge.
Oxidizing properties :	Testing not relevant or not possible due to nature of the product.

9.2 Other information

Solvent(s) % by weight :	Weighted average: 36 %
Water % by weight :	Weighted average: 0 %
VOC content :	344.2 g/l
TOC Content :	Weighted average: 270 g/l
Solvent Gas :	Weighted average: 0.093 m ³ /l

SECTION 10: Stability and reactivity

10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

The product is stable.

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

10.5 Incompatible materials

Highly reactive or incompatible with the following materials: oxidizing materials.
Reactive or incompatible with the following materials: reducing materials.

10.6 Hazardous decomposition products

When exposed to high temperatures (i.e. in case of fire) harmful decomposition products may be formed:

SECTION 10: Stability and reactivity

Decomposition products may include the following materials: carbon oxides nitrogen oxides

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Exposure to component solvent vapor concentrations may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Solvents may cause some of the above effects by absorption through the skin. Symptoms and signs include headaches, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, loss of consciousness. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin, resulting in non-allergic contact dermatitis and absorption through the skin. If splashed in the eyes, the liquid may cause irritation and reversible damage. Accidental swallowing may cause stomach pain. Chemical lung inflammation may occur if the product is taken into the lungs via vomiting.

Direct contact with the eyes can cause irreversible damage, including blindness.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Methylstyrenated phenol	LC50 Inhalation Dusts and mists	Rat	>5 mg/l	4 hours
	LD50 Dermal	Rat	>2000 mg/kg	-
n-butanol	LC50 Inhalation Vapor	Rat	24000 mg/m ³	4 hours
	LD50 Dermal	Rabbit	3400 mg/kg	-
xylene	LD50 Oral	Rat	790 mg/kg	-
	LC50 Inhalation Gas.	Rat	5000 ppm	4 hours
ethylbenzene	LC50 Inhalation Vapor	Rat	6350 ppm	4 hours
	LD50 Oral	Rat	4300 mg/kg	-
2,4,6-tris(dimethylaminomethyl) phenol	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	3500 mg/kg	-
solvent naphtha (petroleum), light arom.	LD50 Dermal	Rat	1280 mg/kg	-
	LD50 Oral	Rat	1200 mg/kg	-
	LD50 Oral	Rat	2169 mg/kg	-
	LC50 Inhalation Vapor	Rat	6193 mg/m ³	4 hours
	LD50 Dermal	Rabbit	3160 mg/kg	-
	LD50 Oral	Rat	3492 mg/kg	-

Acute toxicity estimates

Route	ATE value
Oral	3988.3 mg/kg
Dermal	7700.3 mg/kg
Inhalation (gases)	28138.5 ppm
Inhalation (vapors)	63.14 mg/l

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure
Methylstyrenated phenol	Eyes - Mild irritant	Rabbit	-	-
	Eyes - Severe irritant	Rabbit	-	24 hours 2 milligrams
n-butanol	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams
	Eyes - Severe irritant	Rabbit	-	24 hours 5 milligrams
xylene	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams
	Eyes - Severe irritant	Rabbit	-	24 hours 15 milligrams
ethylbenzene	Skin - Mild irritant	Rabbit	-	-
	Respiratory - Mild irritant	Rabbit	-	-
2,4,6-tris(dimethylaminomethyl) phenol	Eyes - Mild irritant	Rabbit	-	-
	Eyes - Severe irritant	Rabbit	-	24 hours 50 Micrograms
solvent naphtha (petroleum), light arom.	Skin - Severe irritant	Rabbit	-	24 hours 2 milligrams
	Eyes - Mild irritant	Rabbit	-	24 hours 100 microliters
	Respiratory - Mild irritant	Rabbit	-	-

Mutagenic effects

No known significant effects or critical hazards.

Carcinogenicity

No known significant effects or critical hazards.

Reproductive toxicity

No known significant effects or critical hazards.

Teratogenic effects

No known significant effects or critical hazards.

SECTION 11: Toxicological information

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
n-butanol solvent naphtha (petroleum), light arom.	Category 3 Category 3	Not applicable. Not applicable.	Respiratory tract irritation and Narcotic effects Respiratory tract irritation and Narcotic effects

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
ethylbenzene 9-octadecenoic acid (z)-compd. with (z)-n-9-octadecenyl-1,3-propanediamine	Category 2 Category 2	Not determined Oral	hearing organs Not determined

Aspiration hazard

Product/ingredient name	Result
ethylbenzene solvent naphtha (petroleum), light arom.	ASPIRATION HAZARD - Category 1 ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure

Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential chronic health effects

Sensitization : Contains Methylstyrenated phenol, triethylenetetramine. May produce an allergic reaction.

Other information : No additional known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Do not allow to enter drains or watercourses. Harmful to aquatic life with long lasting effects.

Product/ingredient name	Result	Species	Exposure
Methylstyrenated phenol	Acute EC50 15 mg/l Acute EC50 14 - 51 mg/l	Algae Daphnia	72 hours 48 hours
n-butanol	Acute EC50 25.8 mg/l Acute EC50 1328 mg/l	Fish Daphnia	96 hours 96 hours
ethylbenzene	Acute LC50 1.376 mg/l	Fish	96 hours
2,4,6-tris(dimethylaminomethyl) phenol	Chronic NOEC <1000 µg/l Fresh water Acute EC50 84 mg/l	Algae - Pseudokirchneriella subcapitata Algae	96 hours 72 hours
solvent naphtha (petroleum), light arom.	Acute LC50 175 mg/l Acute EC50 2.6 mg/l	Fish Algae - Pseudokirchneriella subcapitata (green algae)	96 hours 96 hours
	Acute EC50 6.14 mg/l Acute LC50 9.22 mg/l	Daphnia - Daphnia magna Fish - Oncorhynchus mykiss (rainbow trout)	48 hours 96 hours

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
n-butanol	OECD 301D Ready Biodegradability - Closed Bottle Test	92 % - 20 days	-	-
xylene	-	>60 % - Readily - 28 days	-	-
ethylbenzene	-	>70 % - Readily - 28 days	-	-
2,4,6-tris(dimethylaminomethyl) phenol	OECD 301D 301D Ready Biodegradability - Closed Bottle Test	4 % - Not readily - 28 days	-	-
solvent naphtha (petroleum), light arom.	-	>70 % - Readily - 28 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
n-butanol	-	-	Readily
xylene	-	-	Readily
ethylbenzene	-	-	Readily
2,4,6-tris(dimethylaminomethyl) phenol	-	-	Not readily
solvent naphtha (petroleum), light arom.	-	-	Readily

SECTION 12: Ecological information

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Methylstyrenated phenol	3.627	-	low
n-butanol	1	3.16	low
xylene	3.12	8.1 - 25.9	low
ethylbenzene	3.6	-	low
2,4,6-tris(dimethylaminomethyl)phenol	0.219	-	low
solvent naphtha (petroleum), light arom.	-	10 - 2500	high

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}): No known data available in our database.

Mobility:

No known data available in our database.

12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

The generation of waste should be avoided or minimized wherever possible. Residues of the product is listed as hazardous waste. Dispose of according to all state and local applicable regulations. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Spillage, remains, discarded clothes and similar should be discarded in a fireproof container.

European waste catalogue no. (EWC) is given below.

European waste catalogue (EWC): 08 01 11*

Packaging

The generation of waste should be avoided or minimized wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

SECTION 14: Transport information

Transport may take place according to national regulation or ADR for transport by road, RID for transport by train, IMDG for transport by sea, IATA for transport by air.

	14.1 UN no.	14.2 Proper shipping name	14.3 Transport hazard class(es)	14.4 PG*	14.5 Env* Additional information
ADR/RID Class	UN1263	PAINT	3 	III	No. Special provisions 640 (E) Tunnel code (D/E)
IMDG Class	UN1263	PAINT	3 	III	No. Emergency schedules (EmS) F-E,S-E
IATA Class	UN1263	PAINT	3 	III	No. -

PG*: Packing group

Env.*: Environmental hazards

14.6 Special precautions for user

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code

SECTION 14: Transport information

Not applicable.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH) Annex XIV - List of substances subject to authorization - Substances of very high concern

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

Other EU regulations

Seveso category This product is controlled under the Seveso III Directive.

Seveso category
P5c: Flammable liquids 2 and 3 not falling under P5a or P5b C6: Flammable (R10)

15.2 Chemical Safety Assessment

This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Abbreviations and acronyms :

ATE = Acute Toxicity Estimate
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 EUH statement = CLP-specific Hazard statement
 RRN = REACH Registration Number
 DNEL = Derived No Effect Level
 PNEC = Predicted No Effect Concentration

Full text of abbreviated H statements :

H225 Highly flammable liquid and vapor.
 H226 Flammable liquid and vapor.
 H302 Harmful if swallowed.
 H304 May be fatal if swallowed and enters airways.
 H312 Harmful in contact with skin.
 H314 Causes severe skin burns and eye damage.
 H315 Causes skin irritation.
 H317 May cause an allergic skin reaction.
 H318 Causes serious eye damage.
 H319 Causes serious eye irritation.
 H332 Harmful if inhaled.
 H335 May cause respiratory irritation.
 H336 May cause drowsiness or dizziness.
 H373 (hearing organs) May cause damage to organs through prolonged or repeated exposure. (hearing organs)
 H373 (oral) May cause damage to organs through prolonged or repeated exposure if swallowed.
 H400 Very toxic to aquatic life.
 H411 Toxic to aquatic life with long lasting effects.
 H412 Harmful to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS] :

Acute Tox. 4, H302 ACUTE TOXICITY (oral) - Category 4
 Acute Tox. 4, H312 ACUTE TOXICITY (dermal) - Category 4
 Acute Tox. 4, H332 ACUTE TOXICITY (inhalation) - Category 4
 Aquatic Acute 1, H400 AQUATIC HAZARD (ACUTE) - Category 1
 Aquatic Chronic 2, H411 AQUATIC HAZARD (LONG-TERM) - Category 2
 Aquatic Chronic 3, H412 AQUATIC HAZARD (LONG-TERM) - Category 3
 Asp. Tox. 1, H304 ASPIRATION HAZARD - Category 1
 Eye Dam. 1, H318 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
 Eye Irrit. 2, H319 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
 Flam. Liq. 2, H225 FLAMMABLE LIQUIDS - Category 2
 Flam. Liq. 3, H226 FLAMMABLE LIQUIDS - Category 3
 Skin Corr. 1B, H314 SKIN CORROSION/IRRITATION - Category 1B
 Skin Irrit. 2, H315 SKIN CORROSION/IRRITATION - Category 2
 Skin Sens. 1, H317 SKIN SENSITIZATION - Category 1
 STOT RE 2, H373 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (hearing organs) - Category 2

SECTION 16: Other information

STOT RE 2, H373 (oral)	SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (oral) - Category 2
STOT SE 3, H335	SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
STOT SE 3, H336	SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
FLAMMABLE LIQUIDS - Category 3	On basis of test data
SKIN CORROSION/IRRITATION - Category 2	Calculation method
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1	Calculation method
SKIN SENSITIZATION - Category 1	Calculation method
AQUATIC HAZARD (LONG-TERM) - Category 3	Calculation method

Notice to reader

📌 Indicates information that has changed from previously issued version.

The information contained in this safety data sheet is based on the present state of knowledge and EU and national legislation. It provides guidance on health, safety and environmental aspects for handling the product in a safe way and should not be construed as any guarantee of the technical performance or suitability for particular applications.

It is always the duty of the user/employer to ascertain that the work is planned and carried out in accordance with the national regulations.

MATERIAL SAFETY DATA SHEET

Page 1 of 5

SECTION I

Date of Preparation: December, 2000 Rev May, 2004

PRODUCT NAME: Flex-Guard250
PRODUCT CLASS: Epoxy Resin, Part A
PRODUCT TYPE: Bisphenol F/Epichlorohydrin Resin

D.O.T. CATEGORY: Chemical, NOIBN

MANUFACTURER: Environmental Coatings
4702 E. Virginia Street.
Mesa, Arizona 85215

TELEPHONE: 1-480-984-7608
EMERGENCY: 1-800/535-5053 INFOTRAC

SECTION II - INGREDIENTS

100% Bisphenol F/Epichlorohydrin Epoxy Resin CASNO. 28064-14-4

SECTION III - HEALTH INFORMATION

The health effects noted below are consistent with requirements under the OSHA hazard Communication Standard (29CFR 1910.1200).

EYE CONTACT: Product may be moderately irritating to the eyes.

SKIN CONTACT: Product may be moderately irritating to the skin and may cause skin sensitization.

INHALATION: Not expected to be a relevant route of exposure. However, high vapor or aerosol mist concentrations may be irritating to the nose, throat and upper respiratory tract.

INGESTION: Not expected to be a relevant route of exposure. However, product is predicted to have a low order of acute oral toxicity.

SIGNS AND SYMPTOMS: Irritation as noted. Skin sensitization (allergy) may be evidenced by rash, especially hives.

AGGRAVATED MEDICAL CONDITIONS: Preexisting skin, eye and respiratory disorders may be aggravated by exposure to the product.

SECTION IV - OCCUPATIONAL EXPOSURE LIMITS

No OSHA or ACGIH limits have been established for this product.

MATERIAL SAFETY DATA SHEET

Flex-Guard 250, Part A

Page 2 of 5

SECTION V - EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT:

Flush eyes with plenty of water for 15 minutes while holding eyelids open. Get medical attention.

SKIN CONTACT:

Remove contaminated clothing/shoes and wipe excess from skin. Flush skin with water. Follow by washing with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned. Contaminated leather articles, including shoes, cannot be decontaminated and should be destroyed to prevent use.

INHALATION:

Remove victim to fresh air and provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Get medical attention.

INGESTION:

Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical advice.

NOTE TO PHYSICIAN:

In general, emesis induction is unnecessary in high viscosity, low volatility products, e.g. neat epoxy resins.

SECTION VI - SUPPLEMENTAL HEALTH INFORMATION

Epichlorohydrin, an impurity in this product (<50 ppm), has been reported to product cancer in laboratory animals and to product mutagenic changes in bacteria and cultured human cells. It has been established by the International Agency for Research on Cancer (IARC) as a probable human carcinogen (IARC Group 2A) based on the following conclusions: Human evidence - inadequate; animal evidence - sufficient. It has been classified as an anticipated human carcinogen by the National Toxicology Program (NTP).

SECTION VII - PHYSICAL DATA

BOILING POINT: N/A

SPECIFIC GRAVITY: 1.2

VAPOR PRESSURE: N/A

MELTING POINT: N/A

SOLUBILITY IN WATER: Negligible

APPEARANCE AND ODOR: Light yellow, Viscous liquid.

EVAPORATION RATE: N/A

MATERIAL SAFETY DATA SHEET

Flex-Guard 250, Part A

Page 3 of 5

SECTION VIII – FIRE AND EXPLOSION HAZARDS

FLASH POINT: >200° F. (Pensky Martin Closed Cup)

EXTINGUISHING MEDIA: Use water fog, alcohol foam, dry chemical or CO₂.

SPECIAL FIRE FIGHTING PROCEDURES: Material will not burn unless preheated. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure NIOSH approved self-contained breathing apparatus. Cool fire exposed containers with water.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION IX - REACTIVITY DATA

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS AND MATERIALS TO AVOID: Can react vigorously with strong oxidizing agents, strong Lewis or mineral acids, and strong mineral and organic bases/especially primary and secondary aliphatic amines.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, aldehydes, acids, and other organic substances may be formed during thermal and oxidative decomposition. Reaction with some curing agents may produce considerable heat. Run-a-way cure reactions may char and decompose the resin system, generating unidentified fumes and vapors, which may be toxic.

SECTION X - EMPLOYEE PROTECTION

RESPIRATORY PROTECTION: Not ordinarily required.

PROTECTIVE CLOTHING: Avoid contact with eyes. Wear safety glasses or goggles as appropriate. Avoid prolonged or repeated contact with skin. Wear chemical-resistant gloves and other clothing as required to minimize contact.

ADDITIONAL PROTECTIVE MEASURES: None.

SECTION XI – ENVIRONMENTAL PROCEDURES

SPILL OR LEAK PROCEDURES:

May burn although not readily ignitable. Use cautious judgement with cleaning up large spills. LARGE SPILLS - Wear respirator and protective clothing as appropriate. Shut off source of leak, if safe to do so. Dike and contain. Remove with vacuum trucks or pump to storage/salvage vessels. Soak up residue with an absorbent such as clay, sand or other suitable material; dispose of properly. Flush area with water to remove trace residue.

SMALL SPILLS - Take up with an absorbent material and dispose of properly.

MATERIAL SAFETY DATA SHEET

Flex-Guard 250, Part A

Page 4 of 5

SECTION XII - SPECIAL PRECAUTIONS

Store in cool, dry place. Keep away from open flames and high temperatures. Containers, even those that have been emptied, may contain hazardous residues. Handle in accordance with the hazard potential of curing agents used. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Launder contaminated clothing before reusing. Contaminated leather articles, including shoes, cannot be decontaminated and should be destroyed to prevent reuse.

Warning! May cause skin and eye irritation. May cause skin sensitization. Minimize bodily contact. Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet facilities.

Heating this resin above 300 deg. F. in the presence of air may cause slow oxidative decomposition; above 500 deg. F., polymerization may occur. Some curing agents, e.g., aliphatic polyamines can product exothermic reactions which in large masses can cause runaway polymerization and charring of the reactants. Fumes and vapors from these thermal and chemical decompositions vary widely in composition and toxicity. Do not breathe fumes. Use a NIOSH-approved respirator as required to prevent over exposure. In accord with 29 CFR 1910.134, use either an atmosphere-supplying respirator or an air-purifying respirator for organic vapors.

SECTION XIII - TRANSPORTATION INFORMATION

Department of Transportation Classification: Not Hazardous by D.O.T. Regulations

D.O.T. Proper Shipping Name: None

SECTION XIV - OTHER REGULATORY CONTROLS

This product is listed on the EPA/TSCA inventory of chemical substances.

Protection of Stratospheric Ozone (Pursuant to Section 611 of the clean air act amendments of 1990): Per 40 CFR Part 82. This product does not contain nor was it directly manufactured with any Class I or Class II ozone-depleting substances.

SECTION XV - STATE REGULATORY INFORMATION

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for State requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

STATE LISTED COMPONENT	CAS No.	Percent	State Code
Epichlorohydrin ,CA65C/R	106-89-8	<50 ppm	MA, PA, RI

MATERIAL SAFETY DATA SHEET

Flex-Guard 250, Part A

Page 5 of 5

CA = California Hazardous Substance List; CA65C, CA65R = California Safe Drinking Water and Toxics Enforcement Act of 1986 or Proposition 65 List; MA = Massachusetts Subs. List, PA = Pennsylvania Haz. Subst. List, RI = Rhode Island Haz. Subst. List.

PROPOSITION 65 Footnote: CA65C – The chemical identified with this code is known to the State of California to cause birth defects or other reproductive harm. CA65C/R – The chemical identified with this code is known to the State of California to cause both cancer and birth defects or other reproductive harm.

THE INFORMATION HEREIN RELATES TO THE PRODUCT NAMED AND IS BASED UPON INFORMATION CONSIDERED TO BE ACCURATE. NO WARRANTY EXPRESSED OR IMPLIED IS INTENDED.

MATERIAL SAFETY DATA SHEET

No information on this page.

SAFETY DATA SHEET

Version 3.7
Revision Date 03/03/2015
Print Date 07/29/2015

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**

Product name : Poly(Bisphenol A-co-epichlorohydrin)
Product Number : 181196
Brand : Aldrich
CAS-No. : 25068-38-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Acute toxicity, Oral (Category 4), H302
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Skin sensitisation (Category 1), H317
Carcinogenicity (Category 1B), H350
Acute aquatic toxicity (Category 2), H401
Chronic aquatic toxicity (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H350 May cause cancer.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201 Obtain special instructions before use.

P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust or mist.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P281	Use personal protective equipment as required.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : (C15 H16 O2 . C3 H5 Cl O)x

Component	Classification	Concentration
Reaction product: bisphenol-A(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)		
CAS-No.	25068-38-6	<= 100 %
EC-No.	500-033-5	
Index-No.	603-074-00-8	
Epichlorhydrin		
CAS-No.	106-89-8	>= 5 - < 10 %
EC-No.	203-439-8	
Index-No.	603-026-00-6	
Registration number	01-2119457436-33-XXXX	

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES**5.1 Extinguishing media****Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE**7.1 Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Epichlorhydrin	106-89-8	TWA	0.500000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Male reproductive Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		Potential Occupational Carcinogen See Appendix A		
		TWA	5.000000 ppm 19.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation The value in mg/m3 is approximate.		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- a) Appearance Form: pellets
- b) Odour No data available
- c) Odour Threshold No data available
- d) pH No data available
- e) Melting point/freezing point No data available
- f) Initial boiling point and No data available

boiling range

- | | |
|---|----------------------------|
| g) Flash point | No data available |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | No data available |
| l) Vapour density | No data available |
| m) Relative density | 1.18 g/mL at 25 °C (77 °F) |
| n) Water solubility | No data available |
| o) Partition coefficient: n-octanol/water | No data available |
| p) Auto-ignition temperature | No data available |
| q) Decomposition temperature | No data available |
| r) Viscosity | No data available |
| s) Explosive properties | No data available |
| t) Oxidizing properties | No data available |

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 13,600 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity). Lungs, Thorax, or Respiration:Dyspnea. Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation**Germ cell mutagenicity**

No data available

Ames test

Result: positive

Carcinogenicity

IARC: 2A - Group 2A: Probably carcinogenic to humans (Epichlorhydrin)

NTP: Reasonably anticipated to be a human carcinogen (Epichlorhydrin)

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence (Epichlorhydrin)

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

No data available

12.2 Persistence and degradability

Biodegradability Result: - According to the results of tests of biodegradability this product is not readily biodegradable.

Remarks: No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700))
Marine pollutant:yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700))

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

The following components are subject to reporting levels established by SARA Title III, Section 302:

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)	25068-38-6	
Epichlorhydrin	106-89-8	2008-11-03

New Jersey Right To Know Components

	CAS-No.	Revision Date
Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)	25068-38-6	
Epichlorhydrin	106-89-8	2008-11-03

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the		

State of California to cause cancer.
Epichlorhydrin

106-89-8

2007-09-28

WARNING: This product contains a chemical known to the
State of California to cause birth defects or other reproductive
harm.
Epichlorhydrin

CAS-No.
106-89-8

Revision Date
2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
Eye Dam.	Serious eye damage
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H226	Flammable liquid and vapour.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H350	May cause cancer.
H401	Toxic to aquatic life.
H402	Harmful to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
Skin Corr.	Skin corrosion
Skin Irrit.	Skin irritation
Skin Sens.	Skin sensitisation

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.7

Revision Date: 03/03/2015

Print Date: 07/29/2015

Hempadur 17369



HEMPEL





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MATERIAL SAFETY DATA SHEET

Page 1 of 5

SECTION I

Date of Preparation: December, 2000 Rev May, 2004

PRODUCT NAME: Flex-Guard250
PRODUCT CLASS: Epoxy Resin, Part A
PRODUCT TYPE: Bisphenol F/Epichlorohydrin Resin

D.O.T. CATEGORY: Chemical, NOIBN

MANUFACTURER: Environmental Coatings
4702 E. Virginia Street.
Mesa, Arizona 85215

TELEPHONE: 1-480-984-7608
EMERGENCY: 1-800/535-5053 INFOTRAC

SECTION II - INGREDIENTS

100% Bisphenol F/Epichlorohydrin Epoxy Resin CASNO. 28064-14-4

SECTION III - HEALTH INFORMATION

The health effects noted below are consistent with requirements under the OSHA hazard Communication Standard (29CFR 1910.1200).

EYE CONTACT: Product may be moderately irritating to the eyes.

SKIN CONTACT: Product may be moderately irritating to the skin and may cause skin sensitization.

INHALATION: Not expected to be a relevant route of exposure. However, high vapor or aerosol mist concentrations may be irritating to the nose, throat and upper respiratory tract.

INGESTION: Not expected to be a relevant route of exposure. However, product is predicted to have a low order of acute oral toxicity.

SIGNS AND SYMPTOMS: Irritation as noted. Skin sensitization (allergy) may be evidenced by rash, especially hives.

AGGRAVATED MEDICAL CONDITIONS: Preexisting skin, eye and respiratory disorders may be aggravated by exposure to the product.

SECTION IV - OCCUPATIONAL EXPOSURE LIMITS

No OSHA or ACGIH limits have been established for this product.

MATERIAL SAFETY DATA SHEET

Flex-Guard 250, Part A

Page 2 of 5

SECTION V - EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT:

Flush eyes with plenty of water for 15 minutes while holding eyelids open. Get medical attention.

SKIN CONTACT:

Remove contaminated clothing/shoes and wipe excess from skin. Flush skin with water. Follow by washing with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned. Contaminated leather articles, including shoes, cannot be decontaminated and should be destroyed to prevent use.

INHALATION:

Remove victim to fresh air and provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Get medical attention.

INGESTION:

Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical advice.

NOTE TO PHYSICIAN:

In general, emesis induction is unnecessary in high viscosity, low volatility products, e.g. neat epoxy resins.

SECTION VI - SUPPLEMENTAL HEALTH INFORMATION

Epichlorohydrin, an impurity in this product (<50 ppm), has been reported to product cancer in laboratory animals and to product mutagenic changes in bacteria and cultured human cells. It has been established by the International Agency for Research on Cancer (IARC) as a probable human carcinogen (IARC Group 2A) based on the following conclusions: Human evidence - inadequate; animal evidence - sufficient. It has been classified as an anticipated human carcinogen by the National Toxicology Program (NTP).

SECTION VII - PHYSICAL DATA

BOILING POINT: N/A

SPECIFIC GRAVITY: 1.2

VAPOR PRESSURE: N/A

MELTING POINT: N/A

SOLUBILITY IN WATER: Negligible

APPEARANCE AND ODOR: Light yellow, Viscous liquid.

EVAPORATION RATE: N/A

MATERIAL SAFETY DATA SHEET

Flex-Guard 250, Part A

Page 3 of 5

SECTION VIII – FIRE AND EXPLOSION HAZARDS

FLASH POINT: >200° F. (Pensky Martin Closed Cup)

EXTINGUISHING MEDIA: Use water fog, alcohol foam, dry chemical or CO₂.

SPECIAL FIRE FIGHTING PROCEDURES: Material will not burn unless preheated. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure NIOSH approved self-contained breathing apparatus. Cool fire exposed containers with water.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION IX - REACTIVITY DATA

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS AND MATERIALS TO AVOID: Can react vigorously with strong oxidizing agents, strong Lewis or mineral acids, and strong mineral and organic bases/especially primary and secondary aliphatic amines.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, aldehydes, acids, and other organic substances may be formed during thermal and oxidative decomposition. Reaction with some curing agents may produce considerable heat. Run-a-way cure reactions may char and decompose the resin system, generating unidentified fumes and vapors, which may be toxic.

SECTION X - EMPLOYEE PROTECTION

RESPIRATORY PROTECTION: Not ordinarily required.

PROTECTIVE CLOTHING: Avoid contact with eyes. Wear safety glasses or goggles as appropriate. Avoid prolonged or repeated contact with skin. Wear chemical-resistant gloves and other clothing as required to minimize contact.

ADDITIONAL PROTECTIVE MEASURES: None.

SECTION XI – ENVIRONMENTAL PROCEDURES

SPILL OR LEAK PROCEDURES:

May burn although not readily ignitable. Use cautious judgement with cleaning up large spills. LARGE SPILLS - Wear respirator and protective clothing as appropriate. Shut off source of leak, if safe to do so. Dike and contain. Remove with vacuum trucks or pump to storage/salvage vessels. Soak up residue with an absorbent such as clay, sand or other suitable material; dispose of properly. Flush area with water to remove trace residue.

SMALL SPILLS - Take up with an absorbent material and dispose of properly.

MATERIAL SAFETY DATA SHEET

Flex-Guard 250, Part A

Page 4 of 5

SECTION XII - SPECIAL PRECAUTIONS

Store in cool, dry place. Keep away from open flames and high temperatures. Containers, even those that have been emptied, may contain hazardous residues. Handle in accordance with the hazard potential of curing agents used. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Launder contaminated clothing before reusing. Contaminated leather articles, including shoes, cannot be decontaminated and should be destroyed to prevent reuse.

Warning! May cause skin and eye irritation. May cause skin sensitization. Minimize bodily contact. Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet facilities.

Heating this resin above 300 deg. F. in the presence of air may cause slow oxidative decomposition; above 500 deg. F., polymerization may occur. Some curing agents, e.g., aliphatic polyamines can product exothermic reactions which in large masses can cause runaway polymerization and charring of the reactants. Fumes and vapors from these thermal and chemical decompositions vary widely in composition and toxicity. Do not breathe fumes. Use a NIOSH-approved respirator as required to prevent over exposure. In accord with 29 CFR 1910.134, use either an atmosphere-supplying respirator or an air-purifying respirator for organic vapors.

SECTION XIII - TRANSPORTATION INFORMATION

Department of Transportation Classification: Not Hazardous by D.O.T. Regulations

D.O.T. Proper Shipping Name: None

SECTION XIV - OTHER REGULATORY CONTROLS

This product is listed on the EPA/TSCA inventory of chemical substances.

Protection of Stratospheric Ozone (Pursuant to Section 611 of the clean air act amendments of 1990): Per 40 CFR Part 82. This product does not contain nor was it directly manufactured with any Class I or Class II ozone-depleting substances.

SECTION XV - STATE REGULATORY INFORMATION

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for State requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

STATE LISTED COMPONENT	CAS No.	Percent	State Code
Epichlorohydrin ,CA65C/R	106-89-8	<50 ppm	MA, PA, RI

MATERIAL SAFETY DATA SHEET

Flex-Guard 250, Part A

Page 5 of 5

CA = California Hazardous Substance List; CA65C, CA65R = California Safe Drinking Water and Toxics Enforcement Act of 1986 or Proposition 65 List; MA = Massachusetts Subs. List, PA = Pennsylvania Haz. Subst. List, RI = Rhode Island Haz. Subst. List.

PROPOSITION 65 Footnote: CA65C – The chemical identified with this code is known to the State of California to cause birth defects or other reproductive harm. CA65C/R – The chemical identified with this code is known to the State of California to cause both cancer and birth defects or other reproductive harm.

THE INFORMATION HEREIN RELATES TO THE PRODUCT NAMED AND IS BASED UPON INFORMATION CONSIDERED TO BE ACCURATE. NO WARRANTY EXPRESSED OR IMPLIED IS INTENDED.

MATERIAL SAFETY DATA SHEET

No information on this page.

SAFETY DATA SHEET

Version 3.7
Revision Date 03/03/2015
Print Date 07/29/2015

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**

Product name : Poly(Bisphenol A-co-epichlorohydrin)
Product Number : 181196
Brand : Aldrich
CAS-No. : 25068-38-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Acute toxicity, Oral (Category 4), H302
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Skin sensitisation (Category 1), H317
Carcinogenicity (Category 1B), H350
Acute aquatic toxicity (Category 2), H401
Chronic aquatic toxicity (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H350 May cause cancer.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201 Obtain special instructions before use.

P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust or mist.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P281	Use personal protective equipment as required.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : (C15 H16 O2 . C3 H5 Cl O)x

Component	Classification	Concentration
Reaction product: bisphenol-A(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)		
CAS-No.	25068-38-6	<= 100 %
EC-No.	500-033-5	
Index-No.	603-074-00-8	
Epichlorhydrin		
CAS-No.	106-89-8	>= 5 - < 10 %
EC-No.	203-439-8	
Index-No.	603-026-00-6	
Registration number	01-2119457436-33-XXXX	

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES**5.1 Extinguishing media****Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE**7.1 Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Epichlorhydrin	106-89-8	TWA	0.500000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Male reproductive Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		Potential Occupational Carcinogen See Appendix A		
		TWA	5.000000 ppm 19.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation The value in mg/m3 is approximate.		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- a) Appearance Form: pellets
- b) Odour No data available
- c) Odour Threshold No data available
- d) pH No data available
- e) Melting point/freezing point No data available
- f) Initial boiling point and No data available

boiling range

- | | |
|---|----------------------------|
| g) Flash point | No data available |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | No data available |
| l) Vapour density | No data available |
| m) Relative density | 1.18 g/mL at 25 °C (77 °F) |
| n) Water solubility | No data available |
| o) Partition coefficient: n-octanol/water | No data available |
| p) Auto-ignition temperature | No data available |
| q) Decomposition temperature | No data available |
| r) Viscosity | No data available |
| s) Explosive properties | No data available |
| t) Oxidizing properties | No data available |

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 13,600 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity). Lungs, Thorax, or Respiration:Dyspnea. Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation**Germ cell mutagenicity**

No data available

Ames test

Result: positive

Carcinogenicity

IARC: 2A - Group 2A: Probably carcinogenic to humans (Epichlorhydrin)

NTP: Reasonably anticipated to be a human carcinogen (Epichlorhydrin)

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence (Epichlorhydrin)

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

No data available

12.2 Persistence and degradability

Biodegradability Result: - According to the results of tests of biodegradability this product is not readily biodegradable.

Remarks: No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700))
Marine pollutant:yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700))

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

The following components are subject to reporting levels established by SARA Title III, Section 302:

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)	25068-38-6	
Epichlorhydrin	106-89-8	2008-11-03

New Jersey Right To Know Components

	CAS-No.	Revision Date
Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)	25068-38-6	
Epichlorhydrin	106-89-8	2008-11-03

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the		

State of California to cause cancer.
Epichlorhydrin

106-89-8

2007-09-28

WARNING: This product contains a chemical known to the
State of California to cause birth defects or other reproductive
harm.
Epichlorhydrin

CAS-No.
106-89-8

Revision Date
2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
Eye Dam.	Serious eye damage
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H226	Flammable liquid and vapour.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H350	May cause cancer.
H401	Toxic to aquatic life.
H402	Harmful to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
Skin Corr.	Skin corrosion
Skin Irrit.	Skin irritation
Skin Sens.	Skin sensitisation

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.7

Revision Date: 03/03/2015

Print Date: 07/29/2015

Surftreat

MATERIAL SAFETY DATA SHEET

SURFTREAT 9214 Old code:TC 8522

Page 1

Substance key: 000000271397
Version : 1 - 2 / USA

Revision Date: 05/15/2007
Date of printing :05/20/2007

Section 01 - Product Information

Identification of the company:	Clariant Corporation 4000 Monroe Road Charlotte, NC, 28205 Telephone No.: +1 704-331-7000
	Information of the substance/preparation: Functional Chemicals Product Safety 1-704-331-7710
	Emergency tel. number: +1 800-424-9300(CHEMTREC)

Trade name: SURFTREAT 9214 Old code:TC 8522
Chemical family: mixture
Primary product use: Additive

Section 02 - Composition information on hazardous ingredients

Hazardous ingredients:

Component	CAS-no. (Trade secret no.)	Concentration
Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	<= 10 %
2-Propanol	67-63-0	<= 10 %
Quaternary ammonium compounds, bis(hydroxyethyl)methyltallow alkyl, chlorides	67784-77-4	<= 5 %
Quaternary ammonium compounds, C12-18-alkyltrimethyl, chlorides	68391-03-7	<= 5 %
Methanol	67-56-1	<= 5 %

Section 03 - Hazards identification

Expected Route of entry:

Inhalation:

Particulates of this material are probably corrosive to respiratory passages, and may cause ulcerations of nose, throat, and larynx.

Skin contact:

Corrosive to the skin.

The acute dermal toxicity of this product is greater than 1000 mg/kg. This product is not toxic by skin absorption.

Eye contact:

Corrosive to the eye.

Ingestion:

This material will probably cause chemical burns of

MATERIAL SAFETY DATA SHEET

SURFTREAT 9214 Old code:TC 8522

Page 2

Substance key: 000000271397
Version : 1 - 2 / USA

Revision Date: 05/15/2007
Date of printing :05/20/2007

the mouth , pharynx, esophagus, and stomach in humans following ingestion.

The acute oral toxicity of this material is between 500 and 5000 mg/kg. Relative to other materials, this material is classified as slightly toxic by ingestion.

yes

Skin absorption:

Health effects of exposure:

Ethoxylated Nonylphenol: If material is deposited as a liquid directly into the lungs, this substance can cause lung injury. At large, maternally toxic, dosage levels, developmental effects (skeletal variations) were observed in rat fetuses. Significance to humans of these effects is unclear.

Isopropanol (67-63-0)

Isopropanol: Eye (Human) - 20 ppm. Oral LDLo (Human) - 8600 mg/kg. TCL0 (Human) - 400 ppm. Inhalation irritant. Indefinite carcinogenic determination (IARC). Toxicity is low via dermal and moderate via oral and intraperitoneal routes. An eye irritant. Acts as a local irritant and in high concentrations as a narcotic. It can cause corneal burns and often eye damage. Ingestion or inhalation of large quantities of the vapor may cause flushing, headache, dizziness, mental depression, nausea, vomiting, narcosis, anesthesia and coma. 100 ml can be fatal. The following is a summary of TSCA Section 4 Test Rule results: large doses given to pregnant rats and rabbits (> 800 mg/kg/day and 480 mg/kg/day respectively) produced evidence of toxicity in the mothers but little evidence of fetal or embryo toxicity (except for slight decreases in fetal weights in rats). No evidence of teratogenicity was noted in either species.

Methanol (67-56-1)

Methanol: Poisoning is usually caused by ingestion. Poisoning by inhalation of vapors is uncommon but can occur at extreme levels of exposure. Intoxication by skin absorption is unlikely unless prolonged contact occurs with injured skin. Acute systemic toxicity is manifested in acidosis and injury to the optic nerve. Onset of symptoms may be delayed as long as 30 hours. A latent period of 12-18 hours is common. Mild intoxication may be associated with non-specific headache, fatigue, nausea and blurring of vision, usually reversible. Moderate intoxication may produce severe headache, dizziness, nausea, vomiting, abdominal or lumbar pain and depression of the central nervous system. Blurring or loss of vision may be temporary to permanent and generally follows latent periods of two to six days. In severe intoxication, these findings are accentuated and there may be shock, coma and hyperemia of the optic disc with blurring of the disc margins. Acidosis is a prominent observation. Death has been reported in about 25% of patients with severe poisoning (carbon dioxide combining power less than 20 meg/l). Visual disturbances, the most damaging aspect of most cases of intoxication, may develop promptly with little warning. The loss of acuity may be accompanied by the perception of spots or a grey mist. Changes in color perception, scotomata, photophobia or tenderness of the eyes. Prognosis for improvement of vision is poor if changes persist for 6 days. Chronic poisoning from inhalation has been described as showing visual impairment with blurring, loss of acuity, contraction of fields and sometimes total blindness. This condition is believed to be exceedingly rare and not well documented. Liquid and vapors may be irritating to the skin and mucous membranes. May have a defatting action upon the skin and dryness and vulnerability to infection may result.

Known effects on other illnesses:

None known.

Listed carcinogen:

IARC: NO NTP: NO OSHA: NO

MATERIAL SAFETY DATA SHEET
SURFTREAT 9214 Old code:TC 8522

Substance key: 000000271397
Version : 1 - 2 / USA

Revision Date: 05/15/2007
Date of printing :05/20/2007

HMIS:

Health: 3*

Flammability: 2

Reactivity: 0

Personal protection: D

Section 04 - First aid measures

After inhalation:

Get victim to fresh air. Give artificial respiration or oxygen if breathing has stopped. Get prompt medical attention. Do not give fluids if victim is unconscious.

After contact with skin:

In case of contact, immediately wash with soap and water for at least 15 minutes. Remove contaminated clothing and shoes while washing. Isolate contaminated clothing for cleaning or disposal. Do not reuse unless thoroughly cleaned. Dispose of contaminated leatherwear. Get immediate medical attention.

After contact with eyes:

Flush thoroughly with water for 15 minutes. Get immediate medical help.

After ingestion:

Seek medical attention immediately.
Do not induce vomiting.

Advice to doctor / Treatment:

Corrosive. May cause stricture. If lavage is performed, suggest endotracheal and/or esophagosopic control. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgement of the physician in response to reactions of the patient.

Section 05 - Fire fighting measures

Flashpoint: 105 °F
Method: PENSKY-MARTENS (closed cup)

Lower explosion limit: 2 %(V)
Data relate to solvent

Upper explosion limit: 12 %(V)
Data relate to solvent

Self ignition: > 797 °F
Information applies to the solvent.

Ignition temperature:

Hazardous combustion products:

In the event of fire the following can be released:
Carbon monoxide (CO)
Carbon dioxide (CO₂)

Extinguishing media: Carbon dioxide, water spray, dry chemical, alcohol resistant foam.
cool containers by spraying with water

MATERIAL SAFETY DATA SHEET
SURFTREAT 9214 Old code:TC 8522

Substance key: 000000271397
 Version : 1 - 2 / USA

Revision Date: 05/15/2007
 Date of printing :05/20/2007

Special fire fighting procedure:

Wear positive pressure self-contained breathing apparatus and full protective gear. Do not direct a solid stream of water or foam into hot burning pools; this may spread fire, cause frothing, and increase fire intensity. Containers can build up pressure if exposed to heat and/or fire. Vapors may form an explosive mixture with air. Vapors may travel to source of ignition and flash back. Vapors are heavier than air and will spread along ground and collect in low or confined areas. Use water spray to keep containers cool.

Unusual fire and explosion hazards:

Emits toxic and corrosive fumes under fire conditions. Containers exposed to intense heat from fires should be cooled with water to prevent vapor pressure buildup which could result in container rupture. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure.

Section 06 - Accidental release measures

Steps to be taken in case of spill or leak:

Remove all spark producing devices or ignition sources. Wear proper personnel protective equipment. Using non-sparking tools collect as a liquid for recycling/disposal or absorb onto a suitable absorbant and secure in a suitable container. Collect any contaminated soils or cleaning waste in a suitable container for proper disposal. Absorbent materials such as dry sand, absorbent booms, and vermiculite may be used to keep material from entering drains, sewers, or streams.

Section 07 - Handling and storage

Advice on safe handling:

Keep away from heat, sparks and open flames. - Avoid breathing vapors or contact with skin, eyes, and clothing.- Use only with adequate ventilation and proper protective eyewear, face shield, gloves and clothing. Wash thoroughly after handling. Keep container closed. Prevent a possible fire hazard by bonding and grounding or inert gas purge. Store in a cool, dry, well-ventilated, fire-resistant location. Avoid storage on wood floors.

Further info on storage conditions:

Store in a cool, dry location away from heat, sparks and open flames.
 Store in original container. Keep tightly sealed.

Section 08 - Exposure controls / personal protection

Occupational exposure limits:

Component	CAS number:	Regulatory list	Type of value	Values / Remarks
ISOPROPANOL	67-63-0	US ACGIH Threshold Limit Values Data	Time Weighted Average (TWA):	200 ppm
ISOPROPANOL	67-63-0	US ACGIH Threshold Limit Values Data	Short Term Exposure Limit (STEL):	400 ppm
METHANOL	67-56-1	US ACGIH Threshold Limit	Time Weighted Average (TWA):	200 ppm

MATERIAL SAFETY DATA SHEET
SURFTREAT 9214 Old code:TC 8522

Substance key: 000000271397
 Version : 1 - 2 / USA

Revision Date: 05/15/2007
 Date of printing :05/20/2007

		Values Data		
METHANOL	67-56-1	US ACGIH Threshold Limit Values Data	Short Term Exposure Limit (STEL):	250 ppm
METHANOL	67-56-1	US ACGIH Threshold Limit Values Data	Skin designation:	Can be absorbed through the skin.

- Respiratory protection:** If airborne concentrations pose a health hazard, become irritating, or exceed recommended limits, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements under 29CFR1910.134.
- Hand protection:** Chemical resistant gloves (butyl rubber, nitrile rubber, polyvinyl alcohol). However, please note that PVA degrades in water.
- Eye protection:** Chemical splash goggles and full face shield.
- Other protective equipment:** Clothing suitable to prevent skin contact.
- Advice on system design:** Local ventilation recommended - mechanical ventilation may be used.

IDLH:

Component	CAS-no. (Trade secret no.)	Value
ISOPROPYL ALCOHOL	67-63-0	2,000 ppm
METHYL ALCOHOL	67-56-1	6,000 ppm

Section 09 - Physical and chemical properties

- Form:** Liquid
- Color:** amber
- pH:** 6.5
- Solubility in water:** soluble
- Density:** 1 g/cm³
- Boiling point :** 180 °F
Information applies to the solvent.
- Partitioning coef. octanol/water:** 1 - 3

Section 10 - Stability and reactivity

- Chemical stability:** Stable.
- Hazardous Polymerization:** Will not occur.
- Conditions to avoid:** Keep away from heat, sparks, open flames, and other sources of ignition.

MATERIAL SAFETY DATA SHEET

SURFTREAT 9214 **Old code:TC 8522**

Page 6

Substance key: 000000271397
Version : 1 - 2 / USA

Revision Date: 05/15/2007
Date of printing :05/20/2007

Section 11 - Toxicological information

Product information:

Acute oral toxicity: LD50 > 1,300 mg/kg (rat)
The product has not been tested. The information is derived from the properties of the individual components.

Acute dermal toxicity: LD50 > 2,000 mg/kg (rabbit)
The product has not been tested. The information is derived from the properties of the individual components.

Skin irritation: corrosive
The product has not been tested. The information is derived from the properties of the individual components.

Eye irritation: corrosive
The product has not been tested. The information is derived from the properties of the individual components.

Section 12 - Ecological information

Product information:

Fish toxicity: LC50 1 - 10 mg/l (96 h, Fish general (Pisces))
The product has not been tested. The information is derived from the properties of the individual components.

Section 13 - Disposal considerations

Waste disposal information:

Recommended disposal is by incineration in approved facilities.

Section 14 - Transport information

DOT Regulation:

Proper shipping name: Corrosive liquids, flammable, n.o.s.
Hazard class: 8
Packing group: II
UN/NA-number: UN 2920
Primary hazard class: 8
Subsidiary hazard class: 3
Technical Name: QUATERNARY AMMONIUM COMPOUND
Emergency Response 132
Guide:
Reportable Quantity: 149,522.000 kg Methanol
0.000 kg

IATA

Proper shipping name: Corrosive liquid, flammable, n.o.s.
Class: 8
Packing group: II
UN/ID number: UN 2920

MATERIAL SAFETY DATA SHEET
SURFTREAT 9214 Old code:TC 8522

Substance key: 000000271397
 Version : 1 - 2 / USA

Revision Date: 05/15/2007
 Date of printing :05/20/2007

Primary risk: 8
 Subsidiary risk: 3
 Remarks: Shipment permitted
 Hazard inducer(s): QUATERNARY AMMONIUM COMPOUND
 Methanol

IMDG

Proper shipping name: Corrosive liquid, flammable, n.o.s.
 Class: 8
 Packing group: II
 UN no.: UN 2920
 Primary risk: 8
 Subsidiary risk: 3
 Hazard inducer(s): QUATERNARY AMMONIUM COMPOUND
 Methanol
 EmS: F-E S-C

Section 15 - Regulatory information

TSCA Status:

All components of this product are listed on the TSCA Inventory.

SARA (section 311/312):

Reactive hazard: no
 Pressure hazard: no
 Fire hazard: yes
 Immediate/acute: yes
 Delayed/chronic: yes

SARA 313 information:

This product contains the chemical or chemicals listed below which are subject to the supplier notification requirements of Section 313 of the Superfund Amendments and Reauthorization Act of 1986 ("SARA") and the requirements of 40 CFR Part 372:

Component	CAS-no. (Trade secret no.)	Concentration
2-Propanol	67-63-0	<= 10 %
Methanol	67-56-1	<= 5 %

Clean Water Act:

This product is not a Clean Water Act priority pollutant.

Volatile organic compounds VOC:

Remarks: Not Available

CERCLA information:

Component	CAS-no. (Trade secret no.)	Percentage	RQ
RCRA HAZARDOUS WASTE NO. D001 UNLISTED HAZARDOUS WASTES CHARACTERISTIC OF IGNITABILITY	67-63-0	<= 10 %	100 LBS
METHANOL METHYL ALCOHOL	67-56-1	<= 5 %	5,000 LBS

MATERIAL SAFETY DATA SHEET
SURFTREAT 9214 Old code:TC 8522

Substance key: 000000271397
Version : 1 - 2 / USA

Revision Date: 05/15/2007
Date of printing :05/20/2007

Section 16 - Other information

Other precautions:

Observe all necessary precautions for handling combustible liquids.

Label information:

DANGER!

May cause burns to skin and eyes. This substance may be toxic to fish or aquatic organisms. **COMBUSTIBLE LIQUID AND VAPOR**

Avoid breathing fumes, vapors, mists, or spray. Avoid contact with skin, eyes and clothing. Do not swallow. Use with adequate ventilation and/or approved respiratory protection. Wear proper protective equipment. Wash thoroughly after handling. Keep container closed when not in use.

Skin contact: wash thoroughly with soap and water. Remove contaminated clothing and shoes. Seek medical attention. Wash clothing before reuse. Eye contact: flush with water for at least 15 minutes while holding eyelids open. Seek immediate medical attention. Ingestion: do not induce vomiting. Seek immediate medical assistance. Inhalation: remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical attention if respiratory irritation continues.

NFPA:

Health: 3

Flammability: 2

Reactivity: 1

This information is supplied under the OSHA Hazard Communication Standard, 29 CFR 1910.1200, and is offered in good faith based on data available to us that we believe to be true and accurate. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable to the material. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate for that use. No warranty, express or implied, is made regarding the accuracy of this data, the hazards connected with the use of the material, or the results to be obtained from the use thereof. We assume no responsibility for damage or injury from the use of the product described herein. Data provided here are typical and not intended for use as product specifications. (R) and TM indicate trademarks of Clariant AG, its business partners or suppliers.

Interseal 670

EGA247_A1

Safety Data Sheet INTERSEAL 670HS PART B



Bulk Sales Reference No.:
SDS Revision Date:
SDS Revision Number:

Sales
Order: {SalesOrd}
EGA247
11/13/2015
A1-4

1. Identification of the preparation and company

1.1. Product identifier

Product Identity INTERSEAL 670HS PART B
Bulk Sales Reference No. EGA247

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended Use See Technical Data Sheet.
Application Method See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Company Name International Paint LLC
6001 Antoine Drive
Houston Texas 77091

Emergency

CHEMTREC (USA) (800) 424-9300
International Paint (713) 682-1711
Poison Control Center (800) 854-6813
Customer Service
International Paint (800) 589-1267
Fax No. (800) 631-7481

2. Hazard identification of the product

2.1. Classification of the substance or mixture

Flam. Liq. 3;H226 Flammable liquid and vapor.
Acute Tox. 5;H313 May be harmful in contact with skin.
Skin Corr. 1;H314 Causes severe skin burns and eye damage.
Eye Dam. 1;H318 Causes serious eye damage.
Skin Sens. 1;H317 May cause an allergic skin reaction.
Aquatic Acute 2;H401 Toxic to aquatic life.
Aquatic Chronic 3;H412 Harmful to aquatic life with long lasting effects.

2.2. Label elements

Using the Toxicity Data listed in section 11 & 12 the product is labelled as follows.



Danger.

H226 Flammable liquid and vapor.

H313 May be harmful in contact with skin.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

H318 Causes serious eye damage.

H401 Toxic to aquatic life.

H412 Harmful to aquatic life with long lasting effects.

P210 Keep away from heat / sparks / open flames / hot surfaces - No smoking.

P260 Do not breathe mist / vapors / spray.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves / eye protection / face protection.

P301+330+331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302+352 IF ON SKIN: Wash with soap and water.

P303+361+353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+312 IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.

P305+351+338 IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

P310 Immediately call a POISON CENTER or doctor / physician.

P312 Call a POISON CENTER or doctor / physician if you feel unwell.

P333+313 If skin irritation or a rash occurs: Get medical advice/attention.

P340 Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P363 Wash contaminated clothing before reuse.

P370 In case of fire: Use water spray, fog, or regular foam..

P403+233 Store in a well ventilated place. Keep container tightly closed.

P405 Store locked up.

P501 Dispose of contents / container in accordance with local / national regulations.

HMIS Rating Health: 3* Flammability: 2 Reactivity: 0

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
Benzyl alcohol CAS Number: 0000100-51-6	10 - 25	Acute Tox. 4;H332 Acute Tox. 4;H302	[1]
AMINOPROPYLMORPHOLINE CAS Number: 0000123-00-2	10 - 25	Acute Tox. 4;H312 Skin Corr. 1;H314	[1]
Xylenes (o-, m-, p- isomers) CAS Number: 0001330-20-7	10 - 25	Flam. Liq. 3;H226 Acute Tox. 4;H332 Acute Tox. 4;H312 Skin Irrit. 2;H315 Eye Irrit. 2;H319 STOT SE 3;H335 Asp. Tox. 1;H304	[1][2]
Tetraethylenepentamine CAS Number: 0000112-57-2	1.0 - 10	Acute Tox. 4;H312 Acute Tox. 4;H302 Skin Corr. 1B;H314 Skin Sens. 1;H317 Aquatic Chronic 2;H411	[1]

[1] Substance classified with a health or environmental hazard.

[2] Substance with a workplace exposure limit.

[3] PBT-substance or vPvB-substance.

*The full texts of the phrases are shown in Section 16.

4. First aid measures

4.1. Description of first aid measures

General Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean or destroy contaminated shoes.

EGA247_A1

Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
Skin	In case of contact, immediately flush skin with soap and plenty of water. Get medical attention immediately.
Ingestion	If swallowed, immediately contact Poison Control Center at 1-800-854-6813. DO NOT induce vomiting unless instructed to do so by medical personnel. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

Overview	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Avoid contact with eyes, skin and clothing.
Inhalation	Harmful if inhaled. Causes nose and throat irritation. Vapors may affect the brain or nervous system causing dizziness, headache or nausea.
Eyes	Causes severe eye irritation. Avoid contact with eyes.
Skin	Causes skin irritation. May cause allergic skin reaction. May be harmful if absorbed through the skin.
Ingestion	Harmful if swallowed. May cause abdominal pain, nausea, vomiting, diarrhea, or drowsiness.

Chronic effects

5. Fire-fighting measures

5.1. Extinguishing media

CAUTION: This product has a very low flashpoint. Use of water spray when fighting fire may be inefficient. SMALL FIRES: Use dry chemical, CO₂, water spray or alcohol-resistant foam. LARGE FIRES: Use water spray, fog, or alcohol-resistant foam. Do not use straight streams. Move containers from fire area if you can do so without risk. Runoff from fire control may cause pollution. Dike fire control water for later disposal. Do not scatter the material.

5.2. Special hazards arising from the substance or mixture

May produce hazardous fumes when heated to decomposition as in welding. Fumes may produce Carbon Dioxide and Carbon Monoxide.

5.3. Advice for fire-fighters

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

ERG Guide No.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

ELIMINATE ALL IGNITION SOURCES (no smoking, flares, sparks or flames in immediate area). Use only non-sparking equipment to handle spilled material and absorbent. Do not touch or walk through spilled material. Stop leak if you can do so without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers. Use non-sparking tools to collect absorbed material.

6.2. Environmental precautions

Do not allow spills to enter drains or watercourses.

6.3. Methods and material for containment and cleaning up

CALL CHEMTREC at (800)-424-9300 for emergency response. Isolate spill or leak area immediately for at least 25 to 50 meters (80 to 160 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. LARGE SPILLS: Consider initial downwind evacuation for at least 300 meters (1000 feet).

7. Handling and storage

7.1. Precautions for safe handling

Handling

Vapors may cause flash fire or ignite explosively.

EGA247_A1

In Storage

Keep away from heat, sparks and flame.

7.2. Conditions for safe storage, including any incompatibilities

Store between 40-100F (4-38C).

Do not get in eyes, on skin or clothing.

Strong oxidizing agents.

Do not smoke. Extinguish all flames and pilot lights, and turn off stoves, heaters, electric motors and other sources of ignition during use and until all vapors are gone.

7.3. Specific end use(s)

Close container after each use.

Wash thoroughly after handling.

Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation.

8. Exposure controls and personal protection
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8.1. Control parameters

Exposure

CAS No.	Ingredient	Source	Value
0000100-51-6	Benzyl alcohol	OSHA	
		ACGIH	
		NIOSH	
		Supplier	
		OHSA, CAN	
		Mexico	
		Brazil	
0000112-57-2	Tetraethylenepentamine	OSHA	
		ACGIH	
		NIOSH	
		Supplier	
		OHSA, CAN	
		Mexico	
		Brazil	
0000123-00-2	AMINOPROPYLMORPHOLINE	OSHA	
		ACGIH	
		NIOSH	
		Supplier	
		OHSA, CAN	
		Mexico	
		Brazil	
0001330-20-7	Xylenes (o-, m-, p- isomers)	OSHA	100 ppm TWA; 435 mg/m3 TWA150 ppm STEL; 655 mg/m3 STEL
		ACGIH	100 ppm TWA150 ppm STEL
		NIOSH	
		Supplier	
		OHSA, CAN	100 ppm TWA150 ppm STEL
		Mexico	100 ppm TWA LMPE-PPT; 435 mg/m3 TWA LMPE-PPT150 ppm STEL [LMPE-CT]; 655 mg/m3 STEL [LMPE-CT]
		Brazil	78 ppm TWA LT; 340 mg/m3 TWA LT

Health Data

CAS No.	Ingredient	Source	Value
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EGA247_A1

0000100-51-6	Benzyl alcohol	NIOSH	
0000112-57-2	Tetraethylenepentamine	NIOSH	
0000123-00-2	AMINOPROPYLMORPHOLINE	NIOSH	
0001330-20-7	Xylenes (o-, m-, p- isomers)	NIOSH	Central nervous system depressant; respiratory and eye irritation

Carcinogen Data

CAS No.	Ingredient	Source	Value
0000100-51-6	Benzyl alcohol	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0000112-57-2	Tetraethylenepentamine	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0000123-00-2	AMINOPROPYLMORPHOLINE	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0001330-20-7	Xylenes (o-, m-, p- isomers)	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: Yes; Group 4: No;

8.2. Exposure controls

Respiratory

Select equipment to provide protection from the ingredients listed in Section 3 of this document. Ensure fresh air entry during application and drying. If you experience eye watering, headache or dizziness or if air monitoring demonstrates dust, vapor, or mist levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH approved) during and after application. Follow respirator manufacturer's directions for respirator use. FOR USERS OF 3M RESPIRATORY PROTECTION ONLY: For information and assistance on 3M occupational health and safety products, call OH&ESD Technical Service toll free in U.S.A. 1-800-243-4630, in Canada call 1-800-267-4414. Please do not contact these numbers regarding other manufacturer's respiratory protection products. 3M does not endorse the accuracy of the information contained in this Material Safety Data Sheet.

Eyes

Avoid contact with eyes. Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 3 of this document. Depending on the site-specific conditions of use, safety glasses, chemical goggles, and/or head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.

Skin

Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 3 of this document. Depending on the site-specific conditions of use, protective gloves, apron, boots, head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.

Engineering Controls

Depending on the site-specific conditions of use, provide adequate ventilation.

Other Work Practices

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, using toilet facilities, etc. Promptly remove soiled clothing and wash clothing thoroughly before reuse. Shower after work using plenty of soap and water.

9. Physical and chemical properties

Appearance	Coloured Liquid
Odour threshold	Not Measured
pH	No Established Limit
Melting point / freezing point	Not Measured
Initial boiling point and boiling range	137 (°C) 279 (°F)
Flash Point	56 (°C) 133 (°F)

EGA247_A1

Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	Lower Explosive Limit: 1 Upper Explosive Limit: No Established Limit
vapor pressure (Pa)	Not Measured
Vapor Density	Heavier than air
Specific Gravity	0.98
Solubility in Water	Not Measured
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature	Not Measured
Decomposition temperature	Not Measured
Viscosity (cSt)	No Established Limit Not Measured
VOC %	Refer to the Technical Data Sheet or label where information is available.

10. Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

This product is stable and hazardous polymerization will not occur. Not sensitive to mechanical impact. Excessive heat and fumes generation can occur if improperly handled.

10.3. Possibility of hazardous reactions

No data available

10.4. Conditions to avoid

No data available

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

May produce hazardous fumes when heated to decomposition as in welding. Fumes may produce Carbon Dioxide and Carbon Monoxide.

11. Toxicological information

Acute toxicity

NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LD50, mg/L/4hr	Inhalation Dust/Mist LD50, mg/L/4hr
Benzyl alcohol - (100-51-6)	1,230.00, Rat - Category: 4	2,000.00, Rabbit - Category: 4	No data available	4.178, Rat - Category: 4
AMINOPROPYLMORPHOLINE - (123-00-2)	3,560.00, Rat - Category: 5	1,214.00, Rabbit - Category: 4	No data available	No data available
Xylenes (o-, m-, p- isomers) - (1330-20-7)	4,299.00, Rat - Category: 5	1,548.00, Rabbit - Category: 4	20.00, Rat - Category: 4	No data available
Tetraethylenepentamine - (112-57-2)	2,140.00, Rat - Category: 5	No data available	No data available	No data available

Item	Category	Hazard
Acute Toxicity (mouth)	Not Classified	Not Applicable
Acute Toxicity (skin)	5	May be harmful in contact with skin.

EGA247_A1

Acute Toxicity (inhalation)	Not Classified	Not Applicable
Skin corrosion/irritation	1	Causes severe skin burns and eye damage.
Eye damage/irritation	1	Causes serious eye damage.
Sensitization (respiratory)	Not Classified	Not Applicable
Sensitization (skin)	1	May cause an allergic skin reaction.
Germ toxicity	Not Classified	Not Applicable
Carcinogenicity	Not Classified	Not Applicable
Reproductive Toxicity	Not Classified	Not Applicable
Specific target organ systemic toxicity (single exposure)	Not Classified	Not Applicable
Specific target organ systemic Toxicity (repeated exposure)	Not Classified	Not Applicable
Aspiration hazard	Not Classified	Not Applicable

12. Ecological information

12.1. Toxicity

No additional information provided for this product. See Section 3 for chemical specific data.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Benzyl alcohol - (100-51-6)	10.00, Lepomis macrochirus	55.00, Daphnia magna	700.00 (72 hr), Algae
AMINOPROPYLMORPHOLINE - (123-00-2)	Not Available	Not Available	Not Available
Xylenes (o-, m-, p- isomers) - (1330-20-7)	3.30, Oncorhynchus mykiss	8.50, Palaemonetes pugio	100.00 (72 hr), Chlorococcales
Tetraethylenepentamine - (112-57-2)	420.00, Poecilia reticulata	24.00, Daphnia magna	2.00 (72 hr), Pseudokirchneriella subcapitata

12.2. Persistence and degradability

No data available

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available

13. Disposal considerations

13.1. Waste treatment methods

Do not allow spills to enter drains or watercourses.

Dispose of in accordance with local, state and federal regulations. (Also reference RCRA information in Section 15 if listed).

14. Transport information

14.1. UN number

UN3470

N.J. Special Hazardous Substances (>.01%) :

AMINOPROPYLMORPHOLINE

Tetraethylenepentamine

Xylenes (o-, m-, p- isomers)

N.J. Env. Hazardous Substances (>.1%) :

Xylenes (o-, m-, p- isomers)

Proposition 65 - Carcinogens (>0%):

(No Product Ingredients Listed)

Proposition 65 - Female Repro Toxins (>0%):

(No Product Ingredients Listed)

Proposition 65 - Male Repro Toxins (>0%):

(No Product Ingredients Listed)

Proposition 65 - Developmental Toxins (>0%):

(No Product Ingredients Listed)

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

H226 Flammable liquid and vapor.

H302 Harmful if swallowed.

H312 Harmful in contact with skin.

H314 Causes severe skin burns and eye damage.

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H319 Causes serious eye irritation.

H332 Harmful if inhaled.

H336 May cause drowsiness or dizziness.

H372 Causes damage to organs through prolonged or repeated exposure.

H411 Toxic to aquatic life with long lasting effects.

The following sections have changed since the previous revision.

End of Document

EGA093_B9

Material Safety Data Sheet INTERSEAL 670HS BUFF PART A



Bulk Sales Reference No.:
MSDS Revision Date:
MSDS Revision Number:

Sales
Order: {SalesOrd}
EGA093
09/28/2013
B9-2

1. Identification of the preparation and company

1.1. Product identifier

Product Identity INTERSEAL 670HS BUFF PART A
Bulk Sales Reference No. EGA093

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended Use See Technical Data Sheet.
Application Method See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Company Name International Paint LLC
6001 Antoine Drive
Houston Texas 77091

Emergency

CHEMTREC (USA) (800) 424-9300
International Paint (713) 682-1711
Poison Control Center (800) 854-6813
Customer Service
International Paint (800) 589-1267
Fax No. (800) 631-7481

2. Hazard identification of the product

2.1. Classification of the substance or mixture

Flam. Liq. 3;H226 Flammable liquid and vapor.
Acute Tox. 5;H313 May be harmful in contact with skin.
Skin Irrit. 2;H315 Causes skin irritation.
Eye Irrit. 2;H319 Causes serious eye irritation.
Skin Sens. 1;H317 May cause an allergic skin reaction.
Aquatic Acute 2;H401 Toxic to aquatic life.
Aquatic Chronic 3;H412 Harmful to aquatic life with long lasting effects.

2.2. Label elements

Using the Toxicity Data listed in section 11 & 12 the product is labelled as follows.



Warning.

H226 Flammable liquid and vapor.
H313 May be harmful in contact with skin.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.

H319 Causes serious eye irritation.

H401 Toxic to aquatic life.

H412 Harmful to aquatic life with long lasting effects.

P210 Keep away from heat / sparks / open flames / hot surfaces - No smoking.

P261 Avoid breathing dust / fume / gas / mist / vapors / spray.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves / eye protection / face protection.

P302+352 IF ON SKIN: Wash with soap and water.

P303+361+353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+351+338 IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

P312 Call a POISON CENTER or doctor / physician if you feel unwell.

P333+313 If skin irritation or a rash occurs: Get medical advice/attention.

P337 If eye irritation persists:.

P362 Take off contaminated clothing and wash before reuse.

P363 Wash contaminated clothing before reuse.

P370 In case of fire: Use water spray, fog, or regular foam..

P403+233 Store in a well ventilated place. Keep container tightly closed.

P501 Dispose of contents / container in accordance with local / national regulations.

HMIS Rating

Health: 2*

Flammability: 3

Reactivity: 0

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
Talc CAS Number: 0014807-96-6	25 - 50	----	[1][2]
Bisphenol A - Epichlorohydrin CAS Number: 0025068-38-6	10 - 25	Eye Irrit. 2;H319 Skin Irrit. 2;H315 Skin Sens. 1;H317 Aquatic Chronic 2;H411	[1]
Xylenes (o-, m-, p- isomers) CAS Number: 0001330-20-7	1.0 - 10	Flam. Liq. 3;H226 Acute Tox. 4;H332 Acute Tox. 4;H312 Skin Irrit. 2;H315	[1][2]
Titanium dioxide CAS Number: 0013463-67-7	1.0 - 10	----	[1][2]
Polymer of epoxy resin and bisphenol A CAS Number: 0025036-25-3	1.0 - 10	Eye Irrit. 2;H319 Skin Irrit. 2;H315, Skin Sens. 1;H317	[1]
Propylene glycol monomethyl ether CAS Number: 0000107-98-2	1.0 - 10	Flam. Liq. 3;H226 STOT SE 3;H336	[1][2]
Benzene, ethyl- CAS Number: 0000100-41-4	1.0 - 10	Flam. Liq. 2;H225 Acute Tox. 4;H332	[1][2]
Quartz CAS Number: 0014808-60-7	1.0 - 10	Acute Tox. 4;H332 STOT RE 2;H373	[1][2]

[1] Substance classified with a health or environmental hazard.

[2] Substance with a workplace exposure limit.

[3] PBT-substance or vPvB-substance.

*The full texts of the phrases are shown in Section 16.

4. First aid measures

EGA093_B9

4.1. Description of first aid measures

General	Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean or destroy contaminated shoes.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
Skin	In case of contact, immediately flush skin with soap and plenty of water. Get medical attention immediately.
Ingestion	If swallowed, immediately contact Poison Control Center at 1-800-854-6813. DO NOT induce vomiting unless instructed to do so by medical personnel. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

Overview	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Avoid contact with eyes, skin and clothing. This product may contain trace amounts of Benzene. The IARC monographs (vol.29) state that there is sufficient evidence for the carcinogenicity in humans and limited evidence for the carcinogenicity in animals. Benzene is also listed in the NTP Annual Report on Carcinogens and in the OSHA Subpart Z table (Specifically Regulated Substances).
Inhalation	Harmful if inhaled. Causes nose and throat irritation. Vapors may affect the brain or nervous system causing dizziness, headache or nausea.
Eyes	Causes severe eye irritation. Avoid contact with eyes.
Skin	Causes skin irritation. May cause allergic skin reaction. May be harmful if absorbed through the skin.
Ingestion	Harmful if swallowed. May cause abdominal pain, nausea, vomiting, diarrhea, or drowsiness.
Chronic effects	Possible cancer hazard. Contains an ingredient which may cause cancer based on animal data (See Section 2 and Section 15 for each ingredient). Risk of cancer depends on duration and level of exposure.

5. Fire-fighting measures

5.1. Extinguishing media

CAUTION: This product has a very low flashpoint. Use of water spray when fighting fire may be inefficient. CAUTION: For mixtures containing alcohol or polar solvent, alcohol-resistant foam may be more effective. SMALL FIRES: Use dry chemical, CO₂, water spray or regular foam. LARGE FIRES: Use water spray, fog, or regular foam. Do not use straight streams. Move containers from fire area if you can do so without risk.

5.2. Special hazards arising from the substance or mixture

HIGHLY FLAMMABLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water.

5.3. Advice for fire-fighters

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

ERG Guide No. 128

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

ELIMINATE ALL IGNITION SOURCES (no smoking, flares, sparks or flames in immediate area). Use only non-sparking equipment to handle spilled material and absorbent. Do not touch or walk through spilled material. Stop leak if you can do so without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers. Use non-sparking tools to collect absorbed material.

6.2. Environmental precautions

Do not allow spills to enter drains or watercourses.

6.3. Methods and material for containment and cleaning up

CALL CHEMTREC at (800)-424-9300 for emergency response. Isolate spill or leak area immediately for at

EGA093_B9

least 50 meters (150 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. LARGE SPILLS: Consider initial downwind evacuation for at least 300 meters (1000 feet).

7. Handling and storage

7.1. Precautions for safe handling

Handling

Vapors may cause flash fire or ignite explosively.

In Storage

Keep away from heat, sparks and flame.

7.2. Conditions for safe storage, including any incompatibilities

Store between 40-100F (4-38C).

Avoid contact with eyes, skin and clothing.

Strong oxidizing agents.

Do not smoke. Extinguish all flames and pilot lights, and turn off stoves, heaters, electric motors and other sources of ignition during use and until all vapors are gone.

7.3. Specific end use(s)

Close container after each use.

Wash thoroughly after handling.

Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure

CAS No.	Ingredient	Source	Value
0000100-41-4	Benzene, ethyl-	OSHA	100 ppm TWA; 435 mg/m3 TWA125 ppm STEL; 545 mg/m3 STEL
		ACGIH	20 ppm TWA
		NIOSH	100 ppm TWA; 435 mg/m3 TWA125 ppm STEL; 545 mg/m3 STEL800 ppm IDLH (10% LEL)
		Supplier	No Established Limit
		OHSA, CAN	20 ppm TWA
		Mexico	100 ppm TWA LMPE-PPT; 435 mg/m3 TWA LMPE-PPT125 ppm STEL [LMPE-CT]; 545 mg/m3 STEL [LMPE-CT]
		Brazil	78 ppm TWA LT; 340 mg/m3 TWA LT
0000107-98-2	Propylene glycol monomethyl ether	OSHA	150 ppm STEL; 540 mg/m3 STEL
		ACGIH	50 ppm TWA100 ppm STEL
		NIOSH	100 ppm TWA; 360 mg/m3 TWA150 ppm STEL; 540 mg/m3 STEL
		Supplier	No Established Limit
		OHSA, CAN	100 ppm TWA150 ppm STEL
		Mexico	No Established Limit
		Brazil	No Established Limit
0001330-20-7	Xylenes (o-, m-, p- isomers)	OSHA	100 ppm TWA; 435 mg/m3 TWA150 ppm STEL; 655 mg/m3 STEL
		ACGIH	100 ppm TWA150 ppm STEL
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	100 ppm TWA150 ppm STEL
		Mexico	100 ppm TWA LMPE-PPT; 435 mg/m3 TWA

EGA093_B9

			LMPE-PPT150 ppm STEL [LMPE-CT]; 655 mg/m3 STEL [LMPE-CT]
		Brazil	78 ppm TWA LT; 340 mg/m3 TWA LT
0013463-67-7	Titanium dioxide	OSHA	15 mg/m3 TWA (total dust)
		ACGIH	10 mg/m3 TWA
		NIOSH	5000 mg/m3 IDLH
		Supplier	No Established Limit
		OHSA, CAN	10 mg/m3 TWA
		Mexico	10 mg/m3 TWA LMPE-PPT (as Ti)20 mg/m3 STEL [LMPE-CT] (as Ti)
		Brazil	No Established Limit
0014807-96-6	Talc	OSHA	No Established Limit
		ACGIH	2 mg/m3 TWA (particulate matter containing no asbestos and
		NIOSH	2 mg/m3 TWA (containing no Asbestos and
		Supplier	No Established Limit
		OHSA, CAN	2 mg/m3 TWA (containing no Asbestos and
		Mexico	2 mg/m3 TWA LMPE-PPT (respirable fraction)
		Brazil	No Established Limit
0014808-60-7	Quartz	OSHA	No Established Limit
		ACGIH	0.025 mg/m3 TWA (respirable fraction)
		NIOSH	0.05 mg/m3 TWA (respirable dust)50 mg/m3 IDLH (respirable dust)
		Supplier	No Established Limit
		OHSA, CAN	0.10 mg/m3 TWA (designated substances regulation, respirable, listed under Silica, crystalline)0.10 mg/m3 TWA (respirable fraction, listed under Silica, crystalline)
		Mexico	0.1 mg/m3 TWA LMPE-PPT (respirable fraction)
		Brazil	No Established Limit
0025036-25-3	Polymer of epoxy resin and bisphenol A	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit
0025068-38-6	Bisphenol A - Epichlorohydrin	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit

Health Data

CAS No.	Ingredient	Source	Value
0000100-41-4	Benzene, ethyl-	NIOSH	Eye skin
0000107-98-2	Propylene glycol monomethyl ether	NIOSH	Eye nose
0001330-20-7	Xylenes (o-, m-, p- isomers)	NIOSH	Central nervous system depressant; respiratory and eye irritation
0013463-67-7	Titanium dioxide	NIOSH	Lung tumors in animals
0014807-96-6	Talc	NIOSH	(containing asbestos); Fibrotic pneumoconiosis; (containing no asbestos); Nonmalignant respiratory effects

EGA093_B9

0014808-60-7	Quartz	NIOSH	Chronic lung disease (silicosis)
0025036-25-3	Polymer of epoxy resin and bisphenol A	NIOSH	No Established Limit
0025068-38-6	Bisphenol A - Epichlorohydrin	NIOSH	No Established Limit

Carcinogen Data

CAS No.	Ingredient	Source	Value
0000100-41-4	Benzene, ethyl-	OSHA	Select Carcinogen: Yes
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: Yes; Group 3: No; Group 4: No;
0000107-98-2	Propylene glycol monomethyl ether	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0001330-20-7	Xylenes (o-, m-, p-isomers)	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: Yes; Group 4: No;
0013463-67-7	Titanium dioxide	OSHA	Select Carcinogen: Yes
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: Yes; Group 3: No; Group 4: No;
0014807-96-6	Talc	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: Yes; Group 4: No;
0014808-60-7	Quartz	OSHA	Select Carcinogen: Yes
		NTP	Known: Yes; Suspected: No
		IARC	Group 1: Yes; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0025036-25-3	Polymer of epoxy resin and bisphenol A	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0025068-38-6	Bisphenol A - Epichlorohydrin	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;

8.2. Exposure controls

Respiratory	Select equipment to provide protection from the ingredients listed in Section 3 of this document. Ensure fresh air entry during application and drying. If you experience eye watering, headache or dizziness or if air monitoring demonstrates dust, vapor, or mist levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH approved) during and after application. Follow respirator manufacturer's directions for respirator use. FOR USERS OF 3M RESPIRATORY PROTECTION ONLY: For information and assistance on 3M occupational health and safety products, call OH&ESD Technical Service toll free in U.S.A. 1-800-243-4630, in Canada call 1-800-267-4414. Please do not contact these numbers regarding other manufacturer's respiratory protection products. 3M does not endorse the accuracy of the information contained in this Material Safety Data Sheet.
Eyes	Avoid contact with eyes. Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 3 of this document. Depending on the site-specific conditions of use, safety glasses, chemical goggles, and/or head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Skin	Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 3 of this document. Depending on the site-specific conditions of use, protective gloves, apron, boots, head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Engineering Controls	Depending on the site-specific conditions of use, provide adequate ventilation.

EGA093_B9

Other Work Practices Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, using toilet facilities, etc. Promptly remove soiled clothing and wash clothing thoroughly before reuse. Shower after work using plenty of soap and water.

9. Physical and chemical properties

Appearance	Coloured Liquid
Odour threshold	Not Measured
pH	No Established Limit
Melting point / freezing point	Not Measured
Initial boiling point and boiling range	117 (C) 243 (F)
Flash Point	36 (C) 97 (F)
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	Lower Explosive Limit: 1 Upper Explosive Limit: No Established Limit
vapor pressure (Pa)	Not Measured
Vapor Density	Heavier than air
Specific Gravity	1.69
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature	Not Measured
Decomposition temperature	Not Measured
Viscosity (cSt)	No Established Limit
VOC %	Refer to the Technical Data Sheet or label where information is available.

9.2. Other information

No further information

10. Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

This product is stable and hazardous polymerization will not occur. Not sensitive to mechanical impact. Excessive heat and fumes generation can occur if improperly handled.

10.3. Possibility of hazardous reactions

No data available

10.4. Conditions to avoid

No data available

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

HIGHLY FLAMMABLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water.

11. Toxicological information

Acute toxicity

NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

EGA093_B9

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LD50, mg/L/4hr	Inhalation Dust/Mist LD50, mg/L/4hr
Talc - (14807-96-6)	No data available	No data available	No data available	No data available
Bisphenol A - Epichlorohydrin - (25068-38-6)	2,000.00, Rat - Category: 4	2,000.00, Rabbit - Category: 4	No data available	No data available
Xylenes (o-, m-, p- isomers) - (1330-20-7)	4,299.00, Rat - Category: 5	1,548.00, Rabbit - Category: 4	20.00, Rat - Category: 4	No data available
Titanium dioxide - (13463-67-7)	10,000.00, Rat - Category: NA	10,000.00, Rabbit - Category: NA	No data available	6.82, Rat - Category: NA
Polymer of epoxy resin and bisphenol A - (25036-25-3)	No data available	No data available	No data available	No data available
Propylene glycol monomethyl ether - (107-98-2)	5,000.00, Rat - Category: 5	13,000.00, Rabbit - Category: NA	No data available	No data available
Benzene, ethyl- - (100-41-4)	3,500.00, Rat - Category: 5	15,433.00, Rabbit - Category: NA	17.20, Rat - Category: 4	No data available
Quartz - (14808-60-7)	No data available	No data available	No data available	No data available

Item	Category	Hazard
Acute Toxicity (mouth)	Not Classified	Not Applicable
Acute Toxicity (skin)	5	May be harmful in contact with skin.
Acute Toxicity (inhalation)	Not Classified	Not Applicable
Skin corrosion/irritation	2	Causes skin irritation.
Eye damage/irritation	2	Causes serious eye irritation.
Sensitization (respiratory)	Not Classified	Not Applicable
Sensitization (skin)	1	May cause an allergic skin reaction.
Germ toxicity	Not Classified	Not Applicable
Carcinogenicity	Not Classified	Not Applicable
Reproductive Toxicity	Not Classified	Not Applicable
Specific target organ systemic toxicity (single exposure)	Not Classified	Not Applicable
Specific target organ systemic Toxicity (repeated exposure)	Not Classified	Not Applicable
Aspiration hazard	Not Classified	Not Applicable

12. Ecological information

12.1. Toxicity

No additional information provided for this product. See Section 3 for chemical specific data.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Talc - (14807-96-6)	Not Available	Not Available	Not Available
Bisphenol A - Epichlorohydrin - (25068-38-6)	3.10, Pimephales promelas	1.40, Daphnia magna	Not Available
Xylenes (o-, m-, p- isomers) - (1330-20-7)	3.30, Oncorhynchus mykiss	8.50, Palaemonetes pugio	100.00 (72 hr), Chlorococcales
Titanium dioxide - (13463-67-7)	1,000.00, Fundulus heteroclitus	5.50, Daphnia magna	5.83 (72 hr), Pseudokirchneriella subcapitata

EGA093_B9

Polymer of epoxy resin and bisphenol A - (25036-25-3)	Not Available	Not Available	Not Available
Propylene glycol monomethyl ether - (107-98-2)	1,000.00, Oncorhynchus mykiss	500.00, Daphnia magna	1,000.00 (96 hr), Selenastrum capricornutum
Benzene, ethyl- - (100-41-4)	4.20, Oncorhynchus mykiss	2.93, Daphnia magna	3.60 (96 hr), Pseudokirchneriella subcapitata
Quartz - (14808-60-7)	Not Available	Not Available	Not Available

12.2. Persistence and degradability

No data available

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available

13. Disposal considerations

13.1. Waste treatment methods

Do not allow spills to enter drains or watercourses.

Dispose of in accordance with local, state and federal regulations. (Also reference RCRA information in Section 15 if listed).

14. Transport information

14.1. UN number UN 1263

14.2. UN proper shipping name PAINT

14.3. Transport hazard class(es)

DOT (Domestic Surface Transportation)

DOT Proper Shipping Name PAINT

DOT Hazard Class 3

UN / NA Number UN 1263

DOT Packing Group III

CERCLA/DOT RQ 81 gal. / 1143 lbs.

IMO / IMDG (Ocean Transportation)

IMDG Proper Shipping Name PAINT

IMDG Hazard Class 3
Sub Class 3

IMDG Packing Group III

System Reference Code 1

14.4. Packing group III

14.5. Environmental hazards

IMDG Marine Pollutant: No

14.6. Special precautions for user

Not Applicable

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Applicable

15. Regulatory information

Regulatory Overview The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented. All ingredients of this product are listed on the TSCA

EGA093_B9

(Toxic Substance Control Act) Inventory or are not required to be listed on the TSCA Inventory.

WHMIS Classification B2 D2B

DOT Marine Pollutants (10%):

(No Product Ingredients Listed)

DOT Severe Marine Pollutants (1%):

(No Product Ingredients Listed)

EPCRA 311/312 Chemicals and RQs (>.1%) :

Cyclohexanone (5000 lb final RQ; 2270 kg final RQ)

Benzene, ethyl- (1000 lb final RQ; 454 kg final RQ)

Xylenes (o-, m-, p- isomers) (100 lb final RQ; 45.4 kg final RQ)

EPCRA 302 Extremely Hazardous (>.1%) :

(No Product Ingredients Listed)

EPCRA 313 Toxic Chemicals (>.1%) :

Benzene, ethyl-

Xylenes (o-, m-, p- isomers)

Mass RTK Substances (>1%) :

Benzene, ethyl-

Propylene glycol monomethyl ether

Quartz

Talc

Titanium dioxide

Xylenes (o-, m-, p- isomers)

Penn RTK Substances (>1%) :

Benzene, ethyl-

Propylene glycol monomethyl ether

Quartz

Talc

Titanium dioxide

Xylenes (o-, m-, p- isomers)

Penn Special Hazardous Substances (>.01%) :

(No Product Ingredients Listed)

RCRA Status:

(No Product Ingredients Listed)

N.J. RTK Substances (>1%) :

Benzene, ethyl-

Propylene glycol monomethyl ether

Quartz

Talc

Titanium dioxide

Xylenes (o-, m-, p- isomers)

N.J. Special Hazardous Substances (>.01%) :

Benzene, ethyl-

Propylene glycol monomethyl ether

Quartz

Talc

Xylenes (o-, m-, p- isomers)

N.J. Env. Hazardous Substances (>.1%) :

Benzene, ethyl-

Xylenes (o-, m-, p- isomers)

Proposition 65 - Carcinogens (>0%):

Benzene

Cobalt

Benzene, ethyl-

Naphthalene

Nickel

Quartz

Titanium dioxide

Proposition 65 - Female Repro Toxins (>0%):
(No Product Ingredients Listed)

Proposition 65 - Male Repro Toxins (>0%):
Benzene

Proposition 65 - Developmental Toxins (>0%):
Benzene

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

- H225 Highly flammable liquid and vapor.
- H226 Flammable liquid and vapor.
- H312 Harmful in contact with skin.
- H315 Causes skin irritation.
- H317 May cause an allergic skin reaction.
- H319 Causes serious eye irritation.
- H332 Harmful if inhaled.
- H336 May cause drowsiness or dizziness.
- H372 Causes damage to organs through prolonged or repeated exposure.
- H373 May cause damage to organs through prolonged or repeated exposure.
- H411 Toxic to aquatic life with long lasting effects.

The following sections have changed since the previous revision.

End of Document

SAFETY DATA SHEET

Version 3.7
Revision Date 03/03/2015
Print Date 07/29/2015

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**

Product name : Poly(Bisphenol A-co-epichlorohydrin)
Product Number : 181196
Brand : Aldrich
CAS-No. : 25068-38-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Acute toxicity, Oral (Category 4), H302
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Skin sensitisation (Category 1), H317
Carcinogenicity (Category 1B), H350
Acute aquatic toxicity (Category 2), H401
Chronic aquatic toxicity (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H350 May cause cancer.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201 Obtain special instructions before use.

P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust or mist.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P281	Use personal protective equipment as required.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : (C15 H16 O2 . C3 H5 Cl O)x

Component	Classification	Concentration
Reaction product: bisphenol-A(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)		
CAS-No.	25068-38-6	<= 100 %
EC-No.	500-033-5	
Index-No.	603-074-00-8	
Epichlorhydrin		
CAS-No.	106-89-8	>= 5 - < 10 %
EC-No.	203-439-8	
Index-No.	603-026-00-6	
Registration number	01-2119457436-33-XXXX	

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES**5.1 Extinguishing media****Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE**7.1 Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Epichlorhydrin	106-89-8	TWA	0.500000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Male reproductive Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		Potential Occupational Carcinogen See Appendix A		
		TWA	5.000000 ppm 19.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation The value in mg/m3 is approximate.		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- a) Appearance Form: pellets
- b) Odour No data available
- c) Odour Threshold No data available
- d) pH No data available
- e) Melting point/freezing point No data available
- f) Initial boiling point and No data available

boiling range

- | | |
|---|----------------------------|
| g) Flash point | No data available |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | No data available |
| l) Vapour density | No data available |
| m) Relative density | 1.18 g/mL at 25 °C (77 °F) |
| n) Water solubility | No data available |
| o) Partition coefficient: n-octanol/water | No data available |
| p) Auto-ignition temperature | No data available |
| q) Decomposition temperature | No data available |
| r) Viscosity | No data available |
| s) Explosive properties | No data available |
| t) Oxidizing properties | No data available |

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 13,600 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity). Lungs, Thorax, or Respiration:Dyspnea. Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation**Germ cell mutagenicity**

No data available

Ames test

Result: positive

Carcinogenicity

IARC: 2A - Group 2A: Probably carcinogenic to humans (Epichlorhydrin)

NTP: Reasonably anticipated to be a human carcinogen (Epichlorhydrin)

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence (Epichlorhydrin)

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

No data available

12.2 Persistence and degradability

Biodegradability Result: - According to the results of tests of biodegradability this product is not readily biodegradable.

Remarks: No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700))
Marine pollutant:yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700))

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

The following components are subject to reporting levels established by SARA Title III, Section 302:

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Epichlorhydrin	106-89-8	2008-11-03

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)	25068-38-6	
Epichlorhydrin	106-89-8	2008-11-03

New Jersey Right To Know Components

	CAS-No.	Revision Date
Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight <= 700)	25068-38-6	
Epichlorhydrin	106-89-8	2008-11-03

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the		

State of California to cause cancer.
Epichlorhydrin

106-89-8

2007-09-28

WARNING: This product contains a chemical known to the
State of California to cause birth defects or other reproductive
harm.
Epichlorhydrin

CAS-No.
106-89-8

Revision Date
2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
Eye Dam.	Serious eye damage
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H226	Flammable liquid and vapour.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H350	May cause cancer.
H401	Toxic to aquatic life.
H402	Harmful to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
Skin Corr.	Skin corrosion
Skin Irrit.	Skin irritation
Skin Sens.	Skin sensitisation

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.7

Revision Date: 03/03/2015

Print Date: 07/29/2015

MEMORANDUM

TO: Susan Perrell, Aera Energy
FROM: Robin Cobbs
SUBJECT: Required Revisions to Air Quality Impact Analysis for Compressed Natural Gas Tanker Trucks Scenario for Aera's East Cat Canyon Oil Field Redevelopment Project
DATE: February 6, 2018
cc: Kathryn Lehr, County of Santa Barbara Planning and Development

Background

In December 2016, the Santa Barbara County Air Pollution Control District (District) conducted an air toxics Health Risk Assessment (HRA) and an Air Quality Impact Analysis (AQIA) for Aera Energy LLC - East Cat Canyon's oil field redevelopment project for Authority to Construct No. 14624. The draft HRA and AQIA are not finalized as the permit has not yet been issued. The permit cannot be issued until the project has been approved by the lead agency, County of Santa Barbara Planning and Development, under the California Environmental Quality Act (CEQA). In October 2017, the District completed the CEQA AQIA and HRA for Aera's same oil field redevelopment project. The CEQA analysis included the emissions from the HRA and AQIA for ATC 14624, along with ongoing permit-exempt emissions such as operational fugitive dust and mobile equipment (e.g., diesel tanker trucks). On January 3, 2018, Aera submitted a revised description of the project, with the primary revision the use of compressed natural gas (CNG) tanker trucks to replace the diesel tanker trucks. Aera summarized the change in emissions in their revised report dated December 2017, *Air Quality Impact Analysis East Cat Canyon Oil Field Redevelopment Project County of Santa Barbara* (Aera's AQIA Report). Aera's AQIA Report stated that there was a small increase in PM_{2.5} emissions, a decrease in NO_x emissions and a large increase in CO emissions. Based on these statements, the District required that the CO dispersion modeling be rerun and all AQIA emissions be compared to confirm that no additional dispersion runs were necessary. This memorandum summarizes the modifications to the modeled emissions and the results of the revised AQIA. The AQIA modeling files and revised criteria pollutant emission calculations for the project are located in the Attachment section of this memorandum.

Revisions to Emissions for AQIA

The revised emissions for the CNG tanker trucks scenario are detailed in the spreadsheets *AQIA Emission Calculations for SLINE1-3_Revised with CNG.xlsx* and *AQIA Emission Calculations for VOL140_217_Revised with CNG by APCD.xlsx*. Tables 1 through 3 below show the change in emissions due to the use of CNG tanker trucks. The emissions from the following sources in the AQIA changed as a result of using CNG tanker trucks:

1. VOL140-217. These sources represent emissions from diesel-fired equipment used to drill wells, emissions from drilling muds at each well pad (including vehicles) and fugitive dust. The use of CNG tanker trucks resulted in a minor change in emissions due to operation and maintenance (O&M) mobile on-road vehicles. Emissions from drilling, fugitive dust and O&M mobile off-road vehicles did not change.
2. SLINE1. This source represents the trucks traveling from off-site to the main plant area within the facility. The use of CNG tanker trucks resulted in an increase in CO and PM_{2.5} emissions for SLINE1.

3. SLINE2. This source represents vehicle emissions associated with O&M, including drilling and offsite travel. The use of CNG tanker trucks resulted in an increase of CO, PM₁₀ and PM_{2.5} for SLINE2.

The emissions from the following sources did not change as a result of the use of CNG tanker trucks:

1. SLINE3. This source represents vehicle emissions associated with employee travel (i.e., gasoline-fueled light-duty trucks).
2. Stationary Source Emissions. These sources represent all permitted equipment including steam generators, an emergency flare and an electrical generator.

Emission Methodology for CNG Tanker Trucks

Compressed natural gas tanker truck trips will vary from day to day and year to year with a peak of 200 maximum daily trips and 72,635 annual trips. Aera provided a detailed schedule of annual trips and mileage. Aera used manufacturer guarantees to calculate emissions from the compressed natural gas tanker truck trips with 400 horsepower traveling an average speed of 55 miles per hour. When manufacturer guarantees were unavailable (i.e., SO₂ and PM₁₀), Aera assumed diesel fueled heavy-heavy-duty T7 single trucks for all tanker truck trips using the aggregate speed and model year of 3 years or newer options in EMFAC2014.

Emission Comparison

Table 1, *AQIA Emissions with Diesel Tanker Trucks*, below shows the emission rates for each pollutant and averaging period used in the District’s October 2017 CEQA AQIA modeling runs (i.e., scenario with diesel tanker trucks).

Sources in CEQA AQIA	NOx		CO		SOx			SOx	PM10	PM10	PM2.5	PM2.5
	1 Hour (g/sec)	Annual (g/sec)	1 Hour (g/sec)	8 Hour (g/sec)	1 Hour (g/sec)	3 Hour (g/sec)	24 Hour (g/sec)	Annual (g/sec)	24 Hour (g/sec)	Annual (g/sec)	24 Hour (g/sec)	Annual (g/sec)
SLINE1	1.556E-03	9.772E-04	5.444E-04	5.444E-04	2.374E-05	2.374E-05	1.943E-05	1.826E-05	1.403E-04	1.318E-04	5.374E-05	5.028E-05
SLINE2	3.456E-03	1.955E-04	1.611E-03	1.611E-03	1.257E-05	1.257E-05	1.010E-06	7.937E-07	3.542E-06	2.888E-06	2.915E-06	2.436E-06
SLINE3	8.535E-04	1.067E-04	7.708E-03	7.708E-03	3.203E-05	3.203E-05	4.004E-06	4.004E-06	8.511E-05	8.511E-05	3.502E-05	3.502E-05
VOL140-217	2.472E-03	2.070E-03	2.000E-02	2.000E-02	4.519E-05	4.519E-05	3.735E-05	3.712E-05	1.496E-03	1.495E-03	1.718E-04	1.703E-04
Permitted Sources (All)	8.201E-01	4.640E-01	2.952E+00	1.686E+00	4.525E-01	3.416E-01	2.929E-01	2.848E-01	2.599E-01	2.548E-01	2.599E-01	2.548E-01
Total	0.828	0.467	2.982	1.716	0.453	0.342	0.293	0.285	0.262	0.256	0.260	0.255

Table 2, *AQIA Emissions with CNG Tanker Trucks*, below shows the emission rates for each pollutant and averaging period for Aera’s proposed revisions using CNG tanker trucks.

Sources in CEQA AQIA	NOx		CO		SOx			SOx	PM10	PM10	PM2.5	PM2.5
	1 Hour (g/sec)	Annual (g/sec)	1 Hour (g/sec)	8 Hour (g/sec)	1 Hour (g/sec)	3 Hour (g/sec)	24 Hour (g/sec)	Annual (g/sec)	24 Hour (g/sec)	Annual (g/sec)	24 Hour (g/sec)	Annual (g/sec)
SLINE1	8.017E-04	2.356E-04	1.557E-01	1.557E-01	2.370E-05	2.370E-05	1.968E-05	1.853E-05	1.059E-04	9.751E-05	9.870E-05	9.533E-05
SLINE2	3.628E-03	2.056E-04	1.769E-03	1.769E-03	1.273E-05	1.273E-05	1.023E-06	8.035E-07	3.884E-06	3.172E-06	3.205E-06	2.682E-06
SLINE3	8.535E-04	1.067E-04	7.708E-03	7.708E-03	3.203E-05	3.203E-05	4.004E-06	4.004E-06	8.511E-05	8.511E-05	3.502E-05	3.502E-05
VOL140-217	2.476E-03	2.071E-03	2.002E-02	2.002E-02	4.519E-05	4.519E-05	3.735E-05	3.712E-05	1.496E-03	1.495E-03	1.720E-04	1.495E-03
Permitted Sources (All)	8.201E-01	4.640E-01	2.952E+00	1.686E+00	4.525E-01	3.416E-01	2.929E-01	2.848E-01	2.599E-01	2.548E-01	2.599E-01	2.548E-01
Total	0.828	0.467	3.137	1.872	0.453	0.342	0.293	0.285	0.262	0.256	0.260	0.256

Table 3, *Percent Difference between CNG Tanker Truck Scenario and Diesel Tanker Truck Scenario*, shows the percent difference in emission rates by pollutant and averaging period between the original

diesel tanker truck scenario and the CNG tanker truck scenario for all emissions included in the CEQA AQIA modeling.

NOx 1 Hour %	NOx Annual %	CO 1 Hour %	CO 8 Hour %	SOx 1 Hour %	SOx 3 Hour %	SOx 24 Hour %	SOx Annual %	PM10 24 Hour %	PM10 Annual %	PM2.5 24 Hour %	PM2.5 Annual %
-0.1	-0.2	5.0	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5

As noted in Aera’s AQIA Report, the pollutant with the largest increase in emissions is CO. There was a small increase in PM_{2.5} emissions of about 0.5 percent. However, the District determined that rerunning the dispersion analysis for the small increase in PM_{2.5} emissions was not required as the modeled impacts from the project with the diesel tanker trucks were far below the threshold. The modeled impacts with the diesel tanker trucks were 0.27 µg/m³, with a threshold of 12 µg/m³. With the ambient background of 7.0 µg/m³ added to the modeled concentration, the total concentration was 7.27 µg/m³. Based on the modeled impacts from the original project, it can be seen with certainty that the small increase in PM_{2.5} emissions will not result in an exceedance of an ambient air quality standard.

Health Risk Assessment

Replacement of the diesel tanker trucks with CNG tanker trucks will reduce the health risk. According to the Office of Environmental Health Hazard Assessment (OEHHA), diesel exhaust contains more than 40 toxic air contaminants. The California Air Resources Board (ARB) estimates that about 70 percent of the cancer risk that the average Californian is exposed to is from breathing toxic air pollutants from diesel exhaust particles. In addition to other risk reduction measures, ARB’s Diesel Risk Reduction Plan calls for the use of alternative fuels, such as compressed natural gas. In OEHHA’s fact sheet, *Health Effects of Diesel Exhaust*, OEHHA states that natural gas combustion produces fewer polluting emissions than diesel fuel. Because the replacement of the diesel tanker trucks with CNG tanker trucks is a risk reduction measure, a revised health risk assessment is not required.

Revised AQIA Results

The 1-hour and the 8-hour averaging periods for CO were rerun in AERMOD using Lakes AERMOD View, Version 9.5.0, as detailed in the District’s October 2017 *Air Quality Impact Analysis Report: Aera Energy LLC East Cat Canyon Oil Field Redevelopment Project California Environmental Quality Act* (District’s October 2017 CEQA AQIA Report for Aera). All modeling parameters, assumptions and methodologies used in the District’s October 2017 CEQA AQIA were used for the revised CO modeling runs. The only change to the AERMOD input files were for the emission rates of CO for SLINE1, SLINE2 and VOL140-217.

The results for the Ambient Air Quality Standard (AAQS) analysis for CO are shown in Table 4, *Revised AAQS Modeling Results for CO*. As shown in Table 4, all CO impacts are below the AAQS.

Table 4 - Revised AAQS Modeling Results for CO

Pollutant	Averaging Period	Modeled Impact Conc. (µg/m ³)	Ambient Background (µg/m ³)	Total Conc. (µg/m ³)	AAQS (µg/m ³)	Percent of AAQS
CO	1-hour	700.8	3565	4265.8	23,000	18.5%
	8-hour	319.0	1311	1630.0	10,000	16.3%

Conclusion

Based on the revised CO modeling results, the proposed revised project at Aera Energy LLC - East Cat Canyon using CNG tanker trucks will not create an exceedance of an ambient air quality standard for CO. Furthermore, the remaining results of the District's October 2017 CEQA AQIA Report for Aera remain valid. Specifically, Aera's proposed revised project will not create an exceedance of an ambient air quality standard for SO₂, NO₂, or PM_{2.5}. The 24-hour PM₁₀ and annual PM₁₀ ambient air quality standards are exceeded based on the background concentrations alone. The modeled concentrations of PM₁₀ (24-hour and annual) for the project are well below the AAQS.

The results of the District's October 2017 *Health Risk Assessment Report: Aera Energy LLC East Cat Canyon Oil Field Redevelopment Project California Environmental Quality Act* remain valid. Specifically, the risk assessment results show that the project at Aera Energy LLC - East Cat Canyon will not present a significant risk to the surrounding community.

References

- Aera Energy LLC. ATC 14624 application, *Application for Authorities to Construct East Cat Canyon Oil Field Redevelopment Project*, submitted April 17, 2015 (Revised September 9, 2015 and March 2016).
- Aera Energy LLC. *East Cat Canyon Oil Field Redevelopment Air Quality Impact Assessment*, prepared by Insight Environmental Consultants, February 2015 (Revised August 2015, March 2016, June 2017, December 2017).
- Santa Barbara County Air Pollution Control District draft Air Quality Impact Analysis for ATC 14624, *Air Quality Impact Analysis Report: Aera Energy LLC East Cat Canyon ATC 14624*.
- Santa Barbara County Air Pollution Control District Air Quality Impact Analysis, *Air Quality Impact Analysis Report: Aera Energy LLC East Cat Canyon Oil Field Redevelopment Project California Environmental Quality Act*, October 2017.
- Santa Barbara County Air Pollution Control District Health Risk Assessment, *Health Risk Assessment Report: Aera Energy LLC East Cat Canyon Oil Field Redevelopment Project California Environmental Quality Act*.
- Cal/EPA's Office of Environmental Health Hazard Assessment and the American Lung Association of California, *Health Effects of Diesel Exhaust*.
<https://oehha.ca.gov/media/downloads/calenviroscreen/indicators/diesel4-02.pdf>

Attachment

Revisions to the CEQA emissions calculations and AQIA input and output files may be found in the following location: [\\sbcapcd.org\shares\Toxics\SourceFiles\SSID08811AeraEnergyLLC-EastCatCanyon\APCD_CEQA_HRAandAQIA\AQIA_CNG_Revision.zip](https://sbcapcd.org/shares/Toxics/SourceFiles/SSID08811AeraEnergyLLC-EastCatCanyon/APCD_CEQA_HRAandAQIA/AQIA_CNG_Revision/Memo_RE_Required_Revisions_to_AQIA_for_CNG_Tanker_Trucks_Scenario_for_Aera's_ECC_Oil_Field_Redevelopment_Project.docx)

\\sbcapcd.org\shares\Toxics\SourceFiles\SSID08811AeraEnergyLLC-EastCatCanyon\APCD_CEQA_HRAandAQIA\AQIA_CNG_Revision\Memo RE Required Revisions to AQIA for CNG Tanker Trucks Scenario for Aera's ECC Oil Field Redevelopment Project.docx

WELL DRILLING EMISSION FACTOR (Ver. 1.0)

Attachment: A-1
 Permit Number:
 Facility: East Cat Canyon Revitalization Project

Equation

*Emission Factor = Formation Fluid Contact Drilling Days Per Well * Daily Drilling Mud Use * Gas to Drilling Mud Ratio * THC Density of Gas * Gas ROC to THC Weight % Ratio * (1 – Extraction Efficiency)*

$$\frac{lb}{well} = \frac{days}{well} * \frac{bbl}{day} * \frac{scf}{bbl} * \frac{lb - THC}{scf} * \frac{ROC Weight \%}{THC Weight \%} * (1 - Efficiency \%)$$

Inputs

<u>Information</u>	<u>Value</u>	<u>Units</u>	<u>Reference</u>
Formation Fluid Contact Drilling Days Per Well.....	8	days/well	Permit Application
Maximum Daily Drilling Mud Use.....	14400	bbls/day	Drilling Rig Mud Pump Rating
Gas to Drilling Mud Ratio.....	7.5	scf/bbl	Equal to 5% of estimated ECC Gas to Oil Ratio
THC Density of Produced Gas.....	0.0456	lb-THC/scf	Obtained from ERG Gas Analysis for West Cat Canyon
Produced Gas ROC to THC Weight % Ratio.....	0.2000	None	Obtained from ERG Gas Analysis for West Cat Canyon
Extraction Efficiency of Mud-Gas Separators.....	98	%	District Default of 98%

ROC Emission Factors

<u>Value</u>	<u>Units</u>	<u>Value</u>	<u>Units</u>	<u>Value</u>	<u>Units</u>
157.59	lb / well	19.70	lb / day	0.82	lb / hour

Processed By: Doug McCormick Date: 8-Sep-17

Inputs

<u>Information</u>	<u>Value</u>	<u>Units</u>	<u>Reference</u>
Formation Fluid Contact Drilling Days Per Well.....	8	days/well	Permit Application
Maximum Daily Drilling Mud Use.....	14400	bbls/day	Drilling Rig Mud Pump Rating
Gas to Drilling Mud Ratio.....	7.5	scf/bbl	Equal to 5% of estimated ECC Gas to Oil Ratio
CH4 Density of Produced Gas.....	0.035	lb-THC/scf	Obtained from ERG Gas Analysis for West Cat Canyon
Extraction Efficiency of Mud-Gas Separators.....	98	%	District Default of 98%

CH4 Emission Factors

<u>Value</u>	<u>Units</u>	<u>Value</u>	<u>Units</u>	<u>Value</u>	<u>Units</u>
605	lb / well	75.60	lb / day	3.15	lb / hour

Raw Produced Gas Analysis from Appendix B of CEQA HRA Report

OILFIELD ENVIRONMENTAL & COMPLIANCE, INC.

Client: ERG Operating Company, LLC 6085 Cat Canyon Road Santa Maria, CA 93454 Attn: Rick Clark Facility: Cat Canyon Gas Sample Description: CVR Compressor Discharge (Inlet to Scrubber) Note: Cat Canyon/WH#186	SAMPLE ID: 1701432-03 Date Sampled: 4/21/17 10:40 AM Date Analyzed: 4/24/17 12:13 PM Lab Contact: Elizabeth Minemann Meter: - Pressure: 70.0 psig Temperature: 91 °F
--	--

Gas Analysis by Chromatography - ASTM D 1945/3588					
Component	MW	Mole %*	Kg-C/Kg-fuel*	Weight %*	G/MCF*
Oxygen	32.00	0.39	N/A	0.58	-
Nitrogen	28.01	1.61	N/A	2.13	-
Hydrogen	2.02	0.18	0.02	0.02	-
Carbon Dioxide	44.01	7.53	0.85	15.65	-
Carbon Monoxide	28.01	0.00	N/A	0.00	-
Methane	16.04	83.40	9.47	63.19	-
Ethane	30.07	1.51	0.17	2.14	0.385
Ethene	28.05	0.00	0.00	0.00	0.000
Propane	44.10	1.35	0.15	2.81	0.372
Propene	42.08	0.00	0.00	0.00	0.000
i-Butane	58.12	0.44	0.05	1.20	0.143
n-Butane	58.12	1.27	0.14	3.48	0.400
neo-Pentane	72.15	0.00	0.00	0.00	0.000
i-Pentane	72.15	0.56	0.06	1.90	0.204
n-Pentane	72.15	0.49	0.06	1.66	0.176
n-Hexane	86.18	0.07	0.01	0.29	0.030
Hexanes Plus less n-Hexane	86.18	1.22	0.14	4.95	0.511
Totals		100.0	11.1	100.0	2.22
Specific Gravity, Calculated		0.7310	air = 1.0000		
Density, Calculated Kg/m3		0.8809	air = 1.205 Kg/m3		
Compressibility (Z) Factor (60°F, 1ATM)		0.9969			
MW of fuel gas, calculated (60°F, 1ATM)		20.81			
Gross Calorific Value					
BTU/ft ³ dry		1062.0			
BTU/ft ³ wet		1043.5			
Net Calorific Value					
BTU/ft ³ dry		961.0	EPA 'F' Factor (60°F, 1ATM)	9553.0	
BTU/ft ³ wet		944.3		SDCF/MMBTU	
Hydrogen Sulfide	425 ppm				
All results reported at 60°F and 14.696 psia.					
* Normalized values			SDCF: Standard dry cubic feet		
ND: None Detected			NA: Not Analyzed		
			G/MCF: Gallons/Thousand Cubic Feet		

Component	Mole %	Mole % / 100	Molecular Weight	Molar Weight
Oxygen	0.39	0.0039	32.00	0.12
Nitrogen	1.61	0.0161	28.01	0.45
Hydrogen	0.18	0.0018	2.02	0.00
Carbon Dioxide	7.53	0.0753	44.01	3.31
Carbon Monoxide	0.00	0.0000	28.01	0.00
Methane	83.40	0.8340	16.04	13.38
Ethane	1.51	0.0151	30.07	0.45
Ethene	0.00	0.0000	28.05	0.00
Propane	1.35	0.0135	44.10	0.60
Propene	0.00	0.0000	42.08	0.00
Iso-Butane	0.44	0.0044	58.12	0.26
N-Butane	1.27	0.0127	58.12	0.74
neo-pentane	0.00	0.0000	72.15	0.00
i-Pentane	0.56	0.0056	72.15	0.40
n-Pentane	0.49	0.0049	72.15	0.35
n-Hexane	0.07	0.0007	86.18	0.06
Hexane Plus	1.22	0.0122	86.18	1.05

Data Analysis

Information	Value	Units
THC Total Molar Weight	17.29	lb / lb-mol
Conversion (assuming STP)	379.48	lb-mol / scf
Produced Gas THC Density	0.04557	lb-THC/scf

Information	Value	Units
THC Weight %	0.81623	%
ROC Weight %	0.16324	%
ROC to THC Weight % Ratio	0.2000	None

Information	Value	Units
CH4 Total Molar Weight	13.38	lb / lb-mol
Conversion (assuming STP)	379.48	lb-mol / scf
Produced Gas CH4 Density	0.035	lb-THC/scf

Proposed Project Construction, Emissions

: (average daily, w/ well drilling muds)

Applicant's Description of Years			Construction, Mitigated (lb/day)					
Project Year	AQIA Year	Year	Total Mitigated Construction Activities					
			NOx (lb/day)	ROC (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO (lb/day)	SOx (lb/day)
1	-3	2017	8.11	2.94	3.62	0.55	67.12	0.11
2	-2	2018	51.45	6.74	32.60	4.00	278.85	0.49
3	-1	2019	81.42	51.32	46.96	5.97	385.70	0.77
4	1	2020	4.82	2.93	2.85	0.38	32.05	0.05
5	2	2021	5.42	3.04	3.34	0.44	35.56	0.05
6	3	2022	2.47	0.55	1.70	0.22	20.82	0.05
7	4	2023	15.34	1.59	14.19	1.59	62.30	0.11
8	5	2024	61.59	46.46	29.37	4.05	390.19	0.82
9	6	2025	1.53	0.33	1.59	0.22	12.11	0.00
10	7	2026	7.18	5.26	4.44	0.60	52.82	0.11
11	8	2027	2.03	0.44	1.42	0.22	16.44	0.05
12	9	2028	3.23	0.71	2.30	0.33	27.51	0.05
13	10	2029	5.37	3.69	3.34	0.44	40.05	0.11
14	11	2030	9.37	8.28	5.64	0.77	69.48	0.16
15	12	2031	7.84	8.01	4.55	0.66	58.08	0.11
16	13	2032	6.30	6.01	3.89	0.55	46.79	0.11
17	14	2033	1.86	0.38	1.48	0.22	14.85	0.05
18	15	2034	7.56	5.42	4.11	0.60	57.59	0.11
19	16	2035	18.85	20.56	11.84	1.64	142.52	0.33
20	17	2036	2.47	0.55	1.53	0.22	19.67	0.05
21	18	2037	2.47	0.55	1.53	0.22	19.67	0.05
22	19	2038	2.41	0.55	1.42	0.22	19.45	0.05
23	20	2039	2.41	0.55	1.42	0.22	19.45	0.05
24	21	2040	2.41	0.55	1.42	0.22	19.45	0.05
25	22	2041	2.41	0.55	1.42	0.22	19.45	0.05
26	23	2042	2.41	0.55	1.48	0.22	19.45	0.05
27	24	2043	2.41	0.55	1.48	0.22	19.45	0.05
28	25	2044	2.41	0.55	1.42	0.22	19.45	0.05
29	26	2045	2.41	0.55	1.42	0.22	19.45	0.05
30	27	2046	2.41	0.55	1.42	0.22	19.45	0.05
31	28	2047	2.41	0.55	1.42	0.22	19.45	0.05
32	29	2048	2.41	0.55	1.48	0.22	19.45	0.05
33	30	2049	2.14	0.44	1.37	0.22	17.04	0.05
	(Max)		81.42	51.32	46.96	5.97	390.19	0.82

Proposed Project Operations, Emissions (by Applicant's years)
: (add solvents)

: (average daily)

: (annual)

Applicant's Description of Years			AQIA Attachment p.50 Add Solvents and Coatings Operations, Solvents (ROC only)		AQIA Attachment p.93 Operations, Mitigated (lb/day) Operational Emissions Summary Mitigated (Stationary Source Emissions Still Included)						AQIA Attachment p.93 Operations, Mitigated (tpy)						GHG
Project Year	AQIA Year	Year	ROC (lb/day)	ROC (tpy)	NOx (lb/day)	ROC (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO (lb/day)	SOx (lb/day)	NOx (tpy)	ROC (tpy)	PM10 (tpy)	PM2.5 (tpy)	CO (tpy)	SOx (tpy)	CO2e (MT/yr)
1	-3	2017															
2	-2	2018															
3	-1	2019															
4	1	2020															
5	2	2021	2.65	0.48	68.22	48.25	29.60	17.42	2,034.71	38.02	9.84	7.29	4.75	2.70	357.19	5.96	167,136
6	3	2022	2.65	0.48	68.87	48.76	34.93	19.06	2,732.29	38.10	9.99	7.38	5.72	3.00	483.19	5.98	168,621
7	4	2023	2.65	0.48	83.16	49.49	35.11	19.42	3,087.26	38.23	10.95	7.47	5.51	2.99	554.82	5.99	170,062
8	5	2024	2.65	0.48	87.92	49.77	34.33	19.34	3,161.12	38.28	11.48	7.51	5.30	2.95	560.62	6.00	170,591
9	6	2025	2.65	0.48	123.48	80.42	39.33	23.86	3,412.42	55.73	17.33	12.89	6.11	3.68	602.70	8.79	275,986
10	7	2026	2.65	0.48	122.17	81.57	48.84	26.99	5,085.91	55.92	17.45	13.11	7.81	4.25	905.68	8.83	279,437
11	8	2027	2.65	0.48	125.94	82.67	54.37	28.78	5,870.91	56.07	17.99	13.30	8.72	4.55	1,048.93	8.85	281,111
12	9	2028	2.65	0.48	127.13	83.03	57.63	29.79	6,289.40	56.13	18.04	13.36	9.29	4.73	1,134.61	8.86	282,129
13	10	2029	2.65	0.48	126.17	83.11	58.62	30.09	6,428.33	56.15	18.03	13.38	9.48	4.79	1,162.03	8.87	282,445
14	11	2030	2.65	0.48	125.77	83.41	61.49	31.00	6,846.52	56.20	18.07	13.43	9.96	4.94	1,231.20	8.88	283,528
15	12	2031	2.65	0.48	126.57	83.56	63.03	31.45	6,985.90	56.23	18.04	13.44	10.11	4.99	1,252.02	8.88	283,764
16	13	2032	2.65	0.48	124.21	83.37	61.60	31.02	6,845.53	56.20	17.96	13.43	9.99	4.95	1,235.23	8.88	283,563
17	14	2033	2.65	0.48	123.10	83.10	59.17	30.25	6,496.26	56.15	17.82	13.38	9.56	4.81	1,171.78	8.87	282,786
18	15	2034	2.65	0.48	122.34	82.98	58.15	29.93	6,356.36	56.14	17.74	13.35	9.35	4.75	1,141.93	8.86	282,425
19	16	2035	2.65	0.48	121.90	82.97	58.16	29.93	6,356.14	56.13	17.73	13.36	9.39	4.76	1,146.13	8.86	282,478
20	17	2036	2.65	0.48	121.53	82.96	58.16	29.93	6,355.94	56.13	17.70	13.35	9.38	4.75	1,144.63	8.86	282,463
21	18	2037	2.65	0.48	121.32	83.01	58.62	30.08	6,425.59	56.14	17.69	13.36	9.41	4.77	1,149.70	8.86	282,521
22	19	2038	2.65	0.48	121.19	83.11	59.64	30.39	6,565.04	56.16	17.71	13.38	9.59	4.82	1,176.82	8.87	282,831
23	20	2039	2.65	0.48	121.93	83.11	59.55	30.35	6,495.53	56.16	17.68	13.37	9.50	4.79	1,162.75	8.87	282,675
24	21	2040	2.65	0.48	121.35	82.90	57.73	29.76	6,216.33	56.13	17.60	13.33	9.17	4.69	1,112.58	8.86	282,085
25	22	2041	2.65	0.48	120.89	82.74	56.27	29.30	6,006.92	56.10	17.55	13.30	8.95	4.62	1,079.74	8.86	281,688
26	23	2042	2.65	0.48	119.47	82.52	54.47	28.75	5,797.19	56.06	17.49	13.28	8.73	4.55	1,047.24	8.85	281,287
27	24	2043	2.65	0.48	119.16	82.42	53.48	28.43	5,657.57	56.05	17.43	13.26	8.55	4.49	1,019.25	8.85	280,944
28	25	2044	2.65	0.48	118.91	82.31	52.62	28.16	5,517.99	56.03	17.37	13.23	8.36	4.43	991.60	8.84	280,603
29	26	2045	2.65	0.48	118.51	82.15	51.22	27.71	5,308.61	56.00	17.31	13.21	8.13	4.36	955.73	8.84	280,161
30	27	2046	2.65	0.48	117.31	81.99	49.83	27.29	5,168.68	55.97	17.26	13.18	7.95	4.30	926.76	8.84	279,811
31	28	2047	2.65	0.48	117.09	81.88	49.00	27.02	5,029.10	55.96	17.21	13.16	7.78	4.24	900.46	8.83	279,484
32	29	2048	2.65	0.48	116.86	81.78	48.06	26.72	4,889.51	55.94	17.16	13.14	7.59	4.18	869.19	8.83	279,111
33	30	2049	2.65	0.48	116.60	81.62	46.84	26.32	4,680.16	55.91	17.11	13.12	7.40	4.12	838.78	8.83	278,737
34		2050	2.65	0.48	116.32	81.46	45.53	25.89	4,470.81	55.89	17.06	13.09	7.20	4.05	803.76	8.82	278,315
35		2051	2.65	0.48	114.63	80.99	41.81	24.70	3,912.19	55.81	16.87	13.00	6.56	3.84	696.01	8.81	276,976
36		2052	2.65	0.48	113.52	80.82	40.68	24.34	3,772.28	55.78	16.82	12.98	6.40	3.79	667.90	8.80	276,639
		Peak (p93)			127.13	83.56	63.03	31.45	6,985.90	56.23	18.07	13.44	10.11	4.99	1,252.02	8.88	283,764
		(Max)			127.13	83.56	63.03	31.45	6,985.90	56.23	18.07	13.44	10.11	4.99	1,252.02	8.88	283,764

Operations plus Long-Term Construction

: (average daily, w/ well drilling muds & solvents)

Applicant's Description of Years			Overlap (lb/day) Operational Emissions including Long-Term Construction Mitigated					
Project Year	AQIA Year	Year	NOx (lb/day)	ROC (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO (lb/day)	SOx (lb/day)
1	-3	2017	8.11	2.94	3.62	0.55	67.12	0.11
2	-2	2018	51.45	6.74	32.60	4.00	278.85	0.49
3	-1	2019	81.42	51.32	46.96	5.97	385.70	0.77
4	1	2020	4.82	2.93	2.85	0.38	32.05	0.05
5	2	2021	73.64	53.93	32.94	17.86	2,070.27	38.07
6	3	2022	71.34	51.95	36.63	19.28	2,753.11	38.15
7	4	2023	98.50	53.73	49.30	21.01	3,149.56	38.34
8	5	2024	149.51	98.88	63.70	23.39	3,551.31	39.10
9	6	2025	125.01	83.39	40.92	24.08	3,424.53	55.73
10	7	2026	129.35	89.47	53.28	27.59	5,138.73	56.03
11	8	2027	127.97	85.75	55.79	29.00	5,887.35	56.12
12	9	2028	130.36	86.39	59.93	30.12	6,316.91	56.18
13	10	2029	131.54	89.44	61.96	30.53	6,468.38	56.26
14	11	2030	135.14	94.34	67.13	31.77	6,916.00	56.36
15	12	2031	134.41	94.22	67.58	32.11	7,043.98	56.34
16	13	2032	130.51	92.03	65.49	31.57	6,892.32	56.31
17	14	2033	124.96	86.13	60.65	30.47	6,511.11	56.20
18	15	2034	129.90	91.05	62.26	30.53	6,413.95	56.25
19	16	2035	140.75	106.18	70.00	31.57	6,498.66	56.46
20	17	2036	124.00	86.15	59.69	30.15	6,375.61	56.18
21	18	2037	123.79	86.20	60.15	30.30	6,445.26	56.19
22	19	2038	123.60	86.30	61.06	30.61	6,584.49	56.21
23	20	2039	124.34	86.30	60.97	30.57	6,514.98	56.21
24	21	2040	123.76	86.09	59.15	29.98	6,235.78	56.18
25	22	2041	123.30	85.93	57.69	29.52	6,026.37	56.15
26	23	2042	121.88	85.71	55.95	28.97	5,816.64	56.11
27	24	2043	121.57	85.61	54.96	28.65	5,677.02	56.10
28	25	2044	121.32	85.50	54.04	28.38	5,537.44	56.08
29	26	2045	120.92	85.34	52.64	27.93	5,328.06	56.05
30	27	2046	119.72	85.18	51.25	27.51	5,188.13	56.02
31	28	2047	119.50	85.07	50.42	27.24	5,048.55	56.01
32	29	2048	119.27	84.97	49.54	26.94	4,908.96	55.99
33	30	2049	118.74	84.70	48.21	26.54	4,697.20	55.96
34		2050	116.32	84.11	45.53	25.89	4,470.81	55.89
35		2051	114.63	83.64	41.81	24.70	3,912.19	55.81
36		2052	113.52	83.47	40.68	24.34	3,772.28	55.78
Peak			149.51	106.18	70.00	32.11	7,043.98	56.46

: (annual, w/ well drilling muds & solvents)

Overlap (tpy) Sum of Construction (AQIA p.90) + Operations (p.92) + Muds + Solvents Mitigated																GHG
Year	NOx (tpy)	ROC (tpy)	PM10 (tpy)	PM2.5 (tpy)	CO (tpy)	SOx (tpy)	CO2e (MT/yr)									
2017	1.48	0.54	0.66	0.10	12.25	0.02	2,371									
2018	9.39	1.23	5.95	0.73	50.89	0.09	9,068									
2019	14.86	9.37	8.57	1.09	70.39	0.14	15,187									
2020	0.88	0.53	0.52	0.07	5.85	0.01	1,069									
2021	10.83	8.33	5.36	2.78	363.68	5.97	168,353									
2022	10.44	7.96	6.03	3.04	486.99	5.99	169,400									
2023	13.75	8.24	8.10	3.28	566.19	6.01	172,160									
2024	22.72	16.47	10.66	3.69	631.83	6.15	185,913									
2025	17.61	13.43	6.40	3.72	604.91	8.79	276,509									
2026	18.76	14.55	8.62	4.36	915.32	8.85	281,579									
2027	18.36	13.86	8.98	4.59	1,051.93	8.86	281,818									
2028	18.63	13.97	9.71	4.79	1,139.63	8.87	283,197									
2029	19.01	14.54	10.09	4.87	1,169.34	8.89	284,143									
2030	19.78	15.42	10.99	5.08	1,243.88	8.91	286,544									
2031	19.47	15.38	10.94	5.11	1,262.62	8.90	286,279									
2032	19.11	15.01	10.70	5.05	1,243.77	8.90	285,617									
2033	18.16	13.93	9.83	4.85	1,174.49	8.88	283,440									
2034	19.12	14.82	10.10	4.86	1,152.44	8.88	284,945									
2035	21.17	17.60	11.55	5.06	1,172.14	8.92	288,666									
2036	18.15	13.93	9.66	4.79	1,148.22	8.87	283,327									
2037	18.14	13.94	9.69	4.81	1,153.29	8.87	283,385									
2038	18.15	13.96	9.85	4.86	1,180.37	8.88	283,684									
2039	18.12	13.95	9.76	4.83	1,166.30	8.88	283,528									
2040	18.04	13.91	9.43	4.73	1,116.13	8.87	282,938									
2041	17.99	13.88	9.21	4.66	1,083.29	8.87	282,541									
2042	17.93	13.86	9.00	4.59	1,050.79	8.86	282,140									
2043	17.87	13.84	8.82	4.53	1,022.80	8.86	281,797									
2044	17.81	13.81	8.62	4.47	995.15	8.85	281,456									
2045	17.75	13.79	8.39	4.40	959.28	8.85	281,013									
2046	17.70	13.76	8.21	4.34	930.31	8.85	280,663									
2047	17.65	13.74	8.04	4.28	904.01	8.84	280,336									
2048	17.60	13.72	7.86	4.22	872.74	8.84	279,964									
2049	17.50	13.68	7.65	4.16	841.89	8.84	279,486									
2050	17.06	13.57	7.20	4.05	803.76	8.82	278,315									
2051	16.87	13.48	6.56	3.84	696.01	8.81	276,976									
2052	16.82	13.46	6.40	3.79	667.90	8.80	276,639									
Peak	22.72	17.60	11.55	5.11	1,262.62	8.92	288,666									

Review of Aera AQIA and AQIA Attachments - motor vehicle trips only

[Peer-review notes - reflecting "AQIA (Revised July 2018)" and AQIA Attachments_11192018 v1.0 (1446 pp PDF)]

Proposed Project Construction, Motor Vehicle Emissions (by Applicant's years)

Applicant's Description of Years			AQIA Attachment p.26 (tpy) Construction Vehicle Travel (On-site Construction Activities)				AQIA Attachment p.28 Construction Off-Site (Drilling, Offsite travel)				AQIA Table 5-16 Replacement Well Drilling (Offsite Mobile Exhaust)			
Project Year	AQIA Year	Year	: (annual)		: (average daily)		: (annual)		: (average daily)		: (annual)		: (average daily)	
			NOx (tpy)	ROC (tpy)	NOx (lb/day)	ROC (lb/day)	NOx (tpy)	ROC (tpy)	NOx (lb/day)	ROC (lb/day)	NOx (tpy)	ROC (tpy)	NOx (lb/day)	ROC (lb/day)
1	-3	2017	0.0685	0.0046	0.38	0.03								
2	-2	2018	0.5673	0.0321	3.11	0.18	0.06	0	0.33	0.00				
3	-1	2019	0.8691	0.0555	4.76	0.30	0.67	0.02	3.67	0.11	0.006	0.0004	0.03	0.00
4	1	2020	0.0187	0.0023	0.10	0.01					0.006	0.0004	0.03	0.00
5	2	2021	0.0161	0.002	0.09	0.01	0.01	0	0.05	0.00	0.006	0.0004	0.03	0.00
6	3	2022	0.0062	0.0006	0.03	0.00	0.01	0	0.05	0.00	0.006	0.0004	0.03	0.00
7	4	2023	0.0818	0.0091	0.45	0.05	0	0	0.00	0.00	0.006	0.0004	0.03	0.00
8	5	2024	0.1121	0.012	0.61	0.07	0.16	0	0.88	0.00	0.006	0.0004	0.03	0.00
9	6	2025	0.0008	0.0001	0.00	0.00	0	0	0.00	0.00	0.006	0.0004	0.03	0.00
10	7	2026	0.0026	0.0004	0.01	0.00	0.02	0	0.11	0.00	0.006	0.0004	0.03	0.00
11	8	2027					0.01	0	0.05	0.00	0.006	0.0004	0.03	0.00
12	9	2028	0.0023	0.0003	0.01	0.00	0	0	0.00	0.00	0.006	0.0004	0.03	0.00
13	10	2029	0.0013	0.0002	0.01	0.00	0.02	0	0.11	0.00	0.006	0.0004	0.03	0.00
14	11	2030	0.0033	0.0005	0.02	0.00	0.03	0	0.16	0.00	0.006	0.0004	0.03	0.00
15	12	2031	0.0036	0.0005	0.02	0.00	0.02	0	0.11	0.00	0.006	0.0004	0.03	0.00
16	13	2032	0.001	0.0001	0.01	0.00	0.02	0	0.11	0.00	0.006	0.0004	0.03	0.00
17	14	2033	0.0002	0	0.00	0.00	0	0	0.00	0.00	0.006	0.0004	0.03	0.00
18	15	2034	0.001	0.0001	0.01	0.00	0.02	0	0.11	0.00	0.006	0.0004	0.03	0.00
19	16	2035	0.0074	0.001	0.04	0.01	0.03	0	0.16	0.00	0.006	0.0004	0.03	0.00
20	17	2036	0.0001	0	0.00	0.00	0	0	0.00	0.00	0.006	0.0004	0.03	0.00
21	18	2037	0.0001	0	0.00	0.00	0	0	0.00	0.00	0.006	0.0004	0.03	0.00
22	19	2038					0	0	0.00	0.00				
23	20	2039												
24	21	2040												
25	22	2041												
26	23	2042												
27	24	2043												
28	25	2044												
29	26	2045												
30	27	2046												
31	28	2047												
32	29	2048												
33	30	2049												

(Max) 0.87 0.06 0.67 0.02

**Motor Vehicle Emissions Only,
Proposed Project Construction**

: (average daily)

**Motor Veh Only
Construction Overall**

Applicant's Description of Years			NOx	ROC
Project Year	AQIA Year	Year	(lb/day)	(lb/day)
1	-3	2017	0.38	0.03
2	-2	2018	3.44	0.18
3	-1	2019	8.47	0.42
4	1	2020	0.14	0.01
5	2	2021	0.18	0.01
6	3	2022	0.12	0.01
7	4	2023	0.48	0.05
8	5	2024	1.52	0.07
9	6	2025	0.04	0.00
10	7	2026	0.16	0.00
11	8	2027	0.09	0.00
12	9	2028	0.05	0.00
13	10	2029	0.15	0.00
14	11	2030	0.22	0.00
15	12	2031	0.16	0.00
16	13	2032	0.15	0.00
17	14	2033	0.03	0.00
18	15	2034	0.15	0.00
19	16	2035	0.24	0.01
20	17	2036	0.03	0.00
21	18	2037	0.03	0.00
22	19	2038	0.00	0.00
23	20	2039		
24	21	2040		
25	22	2041		
26	23	2042		
27	24	2043		
28	25	2044		
29	26	2045		
30	27	2046		
31	28	2047		
32	29	2048		
33	30	2049		

Peak 8.47 0.42

**Proposed Project Operations, Motor Vehicle Emissions (by Applicant's years)
: (average daily)**

AQIA Attachment p.43 Operations, Mitigated (lb/day)			AQIA Attachment p.45 Operations, Mitigated (lb/day)			AQIA Attachment p.46 (lb/day)		AQIA Table 5-23		
Operating Mobile Emissions Excluding Tankers			CNG Vehicle Fleet Mix Operating Tankers Emissions			O&M Mobile On-Road On-Road Type Veh		Motor Veh Only Operation Overall		
Year	NOx (lb/day)	ROC (lb/day)	Year	NOx (lb/day)	ROC (lb/day)	NOx (lb/day)	ROC (lb/day)	NOx (lb/day)	ROC (lb/day)	
2021	2.18	0.10	2021	2.34	1.37	0.54	0.32	5.07	1.79	
2022	1.94	0.09	2022	3.24	1.89	0.54	0.32	5.72	2.30	
2023	15.78	0.56	2023	3.69	2.15	0.54	0.32	20.01	3.03	
2024	20.44	0.78	2024	3.78	2.21	0.54	0.32	24.77	3.30	
2025	18.80	0.74	2025	3.96	2.31	0.54	0.32	23.30	3.37	
2026	15.34	0.64	2026	6.12	3.57	0.54	0.32	22.00	4.53	
2027	16.03	0.68	2027	7.11	4.15	0.54	0.32	23.68	5.15	
2028	16.67	0.73	2028	7.65	4.46	0.54	0.32	24.86	5.51	
2029	15.53	0.70	2029	7.83	4.57	0.54	0.32	23.91	5.59	
2030	14.59	0.68	2030	8.37	4.88	0.54	0.32	23.51	5.89	
2031	15.22	0.72	2031	8.55	4.99	0.54	0.32	24.31	6.03	
2032	13.03	0.64	2032	8.37	4.88	0.54	0.32	21.95	5.85	
2033	12.38	0.63	2033	7.92	4.62	0.54	0.32	20.84	5.57	
2034	11.80	0.62	2034	7.74	4.52	0.54	0.32	20.08	5.46	
2035	11.35	0.61	2035	7.74	4.52	0.54	0.32	19.64	5.45	
2036	10.98	0.60	2036	7.74	4.52	0.54	0.32	19.26	5.44	
2037	10.69	0.60	2037	7.83	4.57	0.54	0.32	19.06	5.49	
2038	10.37	0.59	2038	8.01	4.67	0.54	0.32	18.93	5.59	
2039	11.20	0.65	2039	7.92	4.62	0.54	0.32	19.67	5.59	
2040	10.98	0.64	2040	7.56	4.41	0.54	0.32	19.09	5.38	
2041	10.80	0.64	2041	7.29	4.25	0.54	0.32	18.63	5.22	
2042	9.65	0.58	2042	7.02	4.10	0.54	0.32	17.21	5.00	
2043	9.51	0.58	2043	6.84	3.99	0.54	0.32	16.90	4.89	
2044	9.44	0.58	2044	6.66	3.89	0.54	0.32	16.64	4.79	
2045	9.32	0.58	2045	6.39	3.73	0.54	0.32	16.25	4.63	
2046	8.29	0.52	2046	6.21	3.62	0.54	0.32	15.04	4.46	
2047	8.25	0.52	2047	6.03	3.52	0.54	0.32	14.83	4.36	
2048	8.20	0.52	2048	5.85	3.41	0.54	0.32	14.59	4.25	
2049	8.21	0.52	2049	5.58	3.26	0.54	0.32	14.33	4.10	
2050	8.20	0.52	2050	5.31	3.10	0.54	0.32	14.05	3.94	
2051	7.23	0.46	2051	4.59	2.68	0.54	0.32	12.37	3.46	
2052	6.31	0.41	2052	4.41	2.57	0.54	0.32	11.26	3.30	
(Max)	20.44	0.78	(Max)	8.55	4.99			Peak	24.86	6.03

**Motor Vehicle Emissions Only,
Operations plus Long-Term Construction**

: (average daily)

Motor Veh Only, Overlap (lb/day)

Operational plus Long-Term Construction Motor Veh

Applicant's Description of Years

Project Year	AQIA Year	Year	NOx (lb/day)	ROC (lb/day)
1	-3	2017	0.38	0.03
2	-2	2018	3.44	0.18
3	-1	2019	8.47	0.42
4	1	2020	0.14	0.01
5	2	2021	5.24	1.80
6	3	2022	5.84	2.31
7	4	2023	20.49	3.08
8	5	2024	26.29	3.37
9	6	2025	23.34	3.38
10	7	2026	22.16	4.54
11	8	2027	23.77	5.15
12	9	2028	24.91	5.51
13	10	2029	24.06	5.59
14	11	2030	23.72	5.89
15	12	2031	24.47	6.04
16	13	2032	22.09	5.85
17	14	2033	20.87	5.58
18	15	2034	20.23	5.46
19	16	2035	19.88	5.46
20	17	2036	19.30	5.44
21	18	2037	19.09	5.49
22	19	2038	18.93	5.59
23	20	2039	19.67	5.59
24	21	2040	19.09	5.38
25	22	2041	18.63	5.22
26	23	2042	17.21	5.00
27	24	2043	16.90	4.89
28	25	2044	16.64	4.79
29	26	2045	16.25	4.63
30	27	2046	15.04	4.46
31	28	2047	14.83	4.36
32	29	2048	14.59	4.25
33	30	2049	14.33	4.10
		2050	14.05	3.94
		2051	12.37	3.46
		2052	11.26	3.30
		Peak	26.29	6.04