

Air Case ID: 12882 Permit Id: 4731

FIN No.:	A2745
Company Name:	SV RNO PROPERTY OWNER 1, LLC
HA Basin No: N/A	Increment Tracked ☐
Permit No:	AP73745094 * Select a Permit No
Date App. Received:	03/05/2026  *
Permit Writer:	Not Assigned (NA) *
Case Type:	Class 1 OPTC New *
Default ODS Date:	04/19/2026  *
Actual ODS Date:	
Date App. to be Closed:	10/16/2026  *
Stop Days:	Actual Date App. to be Closed: 10/16/2026
App. Incomplete?	☐
Date App. Closed:	
Fee Paid (\$):	60000 *
Case Description:	
Comments:	
Flag (For Class 4) :	None ▼

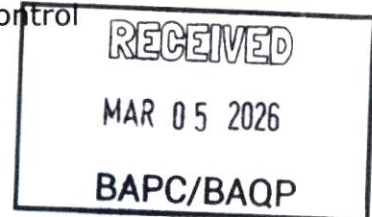


BLUESCAPE
ENVIRONMENTAL

February 24, 2026

Jaimie Mara

Major Source Permitting Supervisor | Bureau of Air Pollution Control
Nevada Department of Environmental Protection
9805 Double R Road, Suite 200
Reno, NV 89521



Subject: New Class I OPTC Air Permit Application Package and Insignificant Activity Determination Package for Construction of the South Valley Technology Facility located in McCarran, Nevada

Dear Ms. Mara:

On behalf of SV RNO Property Owner 1, LLC, BlueScape Environmental (BlueScape) has prepared a Class I Operating Permit to Construct (OPTC) permit application package to construct and operate a new stationary source and an Application for Determination of Insignificant Activities as defined under NAC 445B.288(4). The proposed South Valley Technology Center (Facility) will be located within the Tahoe-Reno Industrial Center (TRIC) near McCarran, Nevada. This permit application, including the required permit application forms provided in Attachment A, is being submitted to the Nevada Division of Environmental Protection (NDEP) Bureau of Air Pollution Control (BAPC).

The Facility will be installing a P1 Power Plant consisting of natural gas-fueled prime engines with combined rating estimated at 144 megawatts (MW); liquified natural gas-fueled (LNG) vaporizers; diesel-fueled emergency black start engine (BSE) gensets with combined rating of 5.5 MW; diesel-fueled emergency backup data center (DC) engines with a combined rating estimated at 318 MW serving as backup power for a data center; Substation diesel-fueled emergency backup engines; fire pump engines; and associated diesel storage tanks, on a portion of an approximately 1,519-acre parcel. Aggreko will be the owner and operator of the prime engines and BSE gensets. Stabilis will be the owner and operator of the LNG vaporizers.

Specifically, as detailed in the provided specifications of Attachment B, the Facility design includes 90 x 2,146 bhp Aggreko Jenbacher J420 engines, 2 x 52 MMBtu/hr Stabilis LNG dual burner vaporizers, 4 x 1,370 kW diesel-fueled BSE gensets, 106 x 3.0 MW (4,393 bhp) Tier 4 Caterpillar 3516E engines, 2 x 1.25 MW Tier 2 Caterpillar C32 Substation engines, and 2 x 488 bhp Tier 3 Clarke C13H0-UFAD50 fire pump

engines. The location of the facility and the proposed engine installation locations are also provided in Attachment B.

Each data center and Substation engine will have an associated 150-gallon diesel tank; the BSE gensets will each have a 1,240-gallon diesel tank; and the fire pumps will each have a 400-gallon diesel tank, for a total of 114 engine-associated tanks. The 114 engine-associated diesel storage tank units are considered Insignificant Activities (IAs) by NDEP, exempt from permit requirements but required to be included in the Class I application. There will also be fourteen (14) 40,000-gallon diesel storage tanks that will feed engine-associated tanks (especially data center engines), each of which exceeds the exemption threshold in NAC445B.288(2)(d); however, the Facility is submitting a separate Application for Determination of Insignificant Activities under NAC445B.288(4), requesting that the 40,000-gallon tanks be formally designated as Insignificant Activities due to very low emissions.

This application is proposing a combined facility-wide permit limitation of 2,226,780 gallons/year of diesel fuel for all the emergency diesel engines, and a limitation of 13,250,998 MMBtu per year of natural gas for the P1 engines and LNG vaporizers, with a rolling 12-month sum for each. The application is also requesting an emissions limitation of 250 tons/year for each criteria pollutant, rolling 12-month sum.

Maximum potential to emit (PTE) was calculated for NO_x, CO, VOC, SO_x, PM₁₀, PM_{2.5}, and CO_{2e}. For all criteria pollutants, the PTE will be below the PSD threshold of 250 TPY, but PTE of CO and NO_x will be above the Class I Title V threshold of 100 TPY, and hazardous air pollutants (HAPs) will exceed the thresholds of 10 TPY for individual HAP emissions and 25 TPY for all HAPs combined, due to formaldehyde emissions.

This application packages contains the following attachments:

- **Class I Operating Permit to Construct (OPTC) Package**

- Attachment A: Class I OPTC Forms:

- Permit Application General Information Form
 - Combustion Equipment Permit Application Forms:
 - P1 Power Plant Engines - 2,146 bhp (1.6 MW) Jenbacher J420 Gas-Fired Generators
 - LNG Vaporizers - 52 MMBtu/hr Liquid Natural Gas Vaporizers, Dual Burners
 - Black Start Gensets - 1,864 bhp (1,370 kW) Tier 4 Volvo Penta Diesel Black Start Engine Gensets
 - Data Center Emergency Backup Engines - 4,393 bhp (3.0 MW) Tier 4 Caterpillar 3516E (EM4718-02) Diesel-Fired Backup Generators
 - Substation Engines - 1,676 bhp (1.25 MW) Tier 2 Caterpillar C32 Diesel-Fired Backup Generators
 - Fire Pump Engines - 488 bhp (364 bhp) Tier 3 Clarke C18H0-UFAD12 Diesel-Fired Generators
 - Liquid Storage Tank Application Forms:

- 150-Gallon Tanks
 - 400-Gallon Tanks
 - 1,240-Gallon Tanks
 - Combustion Equipment, Greenhouse Gases, HAPs and Facility-wide PTE Forms
 - Surface Area Disturbance Application
 - Equipment Location (UTM Coordinates) Form
 - Property Line and Building Location Coordinates Form
- Attachment B: Permit Application Report:
 - Project Description
 - Emission Summary
 - Regulatory Review
 - Site Drawings
 - Detailed Emissions Calculations
 - Equipment Specifications
- Attachment C: Air Dispersion Modeling Report
- **Application for Determination of Insignificant Activities as Defined Under NAC 445B.288(4) Package**
 - Attachment A: Determination of Insignificant Activities Forms
 - General Company Information Form
 - Liquid Storage Tank Application Form
 - Attachment B: TANKS Modeling Output

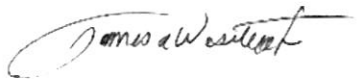
Electronic air dispersion modeling files will be submitted electronically separately. The initial permit processing fee payments of \$60,000 for the Class 1 OPTC application and \$1,000 for the Storage Tank IA Application for Determination of Insignificant Activities will be sent electronically.

If you have any questions regarding this permit application package, please contact me at (858) 774-2009.

Best regards,

BLUESCAPE ENVIRONMENTAL

a California Corporation



James A. Westbrook, CCM
President

Enclosures

ATTACHMENT A
CLASS I OPTC FORMS

Class I

Air Quality Operating Permit (AQOP), Operating Permit to Construct (OPTC), and Prevention
of Significant Deterioration (PSD)
Application Form

Facility Name: South Valley Technology Park

Existing Facility ID: N/A – New Facility

Existing Class I AQOP/OPTC: N/A – New Facility

Type of Facility: Data Center

Number of Units (including IA's) in Facility: 320

Number of Units (including IA's) Affected in Action: 320

Application Type:

- | | |
|--|---|
| ☐ New AQOP | ☐ Rollover OPTC to Existing AQOP |
| ☐ Minor Revision of Existing AQOP | ☐ Administrative Revision of Existing AQOP |
| ☐ Significant Revision of Existing AQOP | ☐ New PSD AQOP |
| ☐ Renewal of Existing AQOP | ☐ Major PSD Revision of AQOP |
| ☒ New OPTC | ☐ New PSD OPTC |
| ☐ Revision of OPTC | ☐ Major PSD Revision of OPTC |
| ☐ Rollover OPTC to a New AQOP | |



Please Submit Application to:

Nevada Division of Environmental Protection
Bureau of Air Pollution Control, Class I Permitting Branch
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701-5249
Phone (775) 687-9349

September 2024
(Ver. 5)

IMPORTANT INFORMATION

- The Application packet contains:
 - General Company Information Form
 - Industrial Process Application Form
 - Combustion Equipment Application Form
 - Storage Silo Application Form
 - Liquid Storage Tanks Application Form
 - Facility-Wide Potential to Emit Table
 - Surface Area Disturbance Form
 - Plant Boundary Coordinates Form
 - Plant Building Parameters Forms
 - Application Certification Document with Required Attachments
- Please see the Guidance Document located at <https://ndep.nv.gov/air/permitting/download-permit-forms> for additional instructions on how to complete the application.
- The application is available from the Nevada Division of Environmental Protection – Bureau of Air Pollution Control (BAPC) in a Microsoft Word file, or on the internet at <https://ndep.nv.gov/air/permitting/download-permit-forms>. A printed copy of the application must be submitted (mailed or hand delivered), along with an electronic version.
- The application filing fee required by Nevada Administrative Code (NAC) 445B.327 must be submitted with the completed application. Checks must be made payable to the “Nevada State Treasurer, Environmental Protection” with “BAPC” noted in the memo line. Fees may also be submitted electronically at <https://epayments.ndep.nv.gov/>.
- This application shall be used for a new, renewal, and revision of Class I sources, including AQOP, OPTC, rollover OPTC, and PSD actions.
- An application for a Class I AQOP, OPTC, and PSD must be signed by the Responsible Official, as defined in NAC 445B.156. The certification document (signature page) is the last page of the application and the original “wet” signature must be provided.
- All items in the application must be addressed. If an item does not apply “N/A” or similar notation must be entered in the appropriate blank. All other information must be provided. Incomplete applications will be returned to the Responsible Official within:
 - 45 days for a new or revision of Class I OPTC. (NAC 445B.3364(1))
 - 30 days for sources subject to permitting requirements set forth in 40 CFR 52.21 applying for a new or revision of Class I PSD OPTC. (NAC 445B.3364(2))
 - 60 days for a new, significant revision, or renewal of Class I AQOP. (NAC 445B.3395(1), NAC 445B.3443(3))
 - 10 working days for a minor revision of Class I AQOP. (NAC 445B.3395(5))
 - 30 days for sources subject to permitting requirements set forth in 40 CFR 52.21 applying for a new of Class I PSD. (NAC 445B.3395(2))
 - 45 days for an administrative revision of Class I OPTC. (NAC 445B.3441(2) and NAC 445B.3364(1))

IMPORTANT INFORMATION (continued)

- For the renewal of a Class I Operating Permit, a **complete** application and corresponding processing fee must be submitted in accordance with NAC 445B.3443(2) at least 240 days prior to the expiration date of the current permit but not earlier than 18 months. The BAPC suggests that the application be submitted well in advance of the timeline outlined in NAC 445B.3443 to ensure the application is deemed complete. The BAPC has 60 days to deem the application complete or incomplete. As stated above, incomplete applications will be returned within 60 days of the receipt of the application. Therefore, the BAPC recommends the application be submitted at least 300 days prior to expiration of the current permit.
- For stationary sources subject to the provisions regarding new source review set forth in United States Code (U.S.C.) Title 42 7501 through 7515, inclusive (nonattainment areas), include all information required by U.S.C. Title 42 7503 pursuant to NAC 445B.3363(2)(b)(3).
- For a proposed new major source or a proposed major modification to an existing stationary source that is subject to the provisions of 40 CFR 52.21, include all information required by 40 CFR 52.21 pursuant to NAC 445B.3368(3)(a).
- For a proposed new major source, or a proposed significant revision to an existing stationary source which is not subject to the provisions of 40 CFR 52.21, include all information as required by NAC 445B.308 through 445B.313, inclusive, pursuant to NAC 445B.3368(3)(b).
- For a proposed new major source or a proposed significant revision to an existing stationary source which is subject to the requirements of U.S.C. Title 42 7412 regarding hazardous air pollutants, include all information required by NAC 445B.308 through 445B.313, inclusive, pursuant to NAC 445B.3368(3)(c).

GENERAL COMPANY INFORMATION FORM

1. **Briefly describe the permitted facility's process and include the Standard Industrial Classification (SIC) number and North American Industry Classification System (NAICS). Add details in the attached Process Narrative.**

The South Valley Technology Center will operate both prime and emergency power systems. Prime power will be supplied by 90 Jenbacher J420 natural gas engines, supported by four 1,370-kW Tier 4 black start diesel engines, and two 52-MMBtu/hr dual-burner LNG vaporizers. Emergency power will be provided by 106 Tier 4 Caterpillar 3516E diesel generators, which will operate up to 100 hours per year for maintenance and testing. Additional backup equipment includes two Tier 2 Caterpillar C32 substation diesel engines (limited to 100 hours per year) and two Tier 3 Clark C18H0-UFAD12 diesel fire pump engines, (limited to 40 hours per year). All of the diesel-fueled emergency engines, except for the fire pump engines, will be available under NV Energy's demand response (DR) program, which allows for 50 hours per year per engine of emergency use when called upon by NV Energy, in addition to the 50 hours allowed for non-emergency testing and maintenance. Emergency engines will run at full load only during utility power instability or outages, or when called upon to operate under the DR program. The facility's SIC code is 7374 and NAICS code is 518210.

2. **Company Name and Address that are to appear on the operating permit [NAC 445B.295(1)]:**

Name: SV RNO Property Owner 1, LLC
Address: 3200 Cherry Creek S Drive, Suite 700
City: Denver
State: Colorado Zip Code: 80209

3. **Owner's Name and Address [NAC 445B.295(1)]:**

Name: SV RNO Property Owner 1, LLC
Address: 3200 Cherry Creek S Drive, Suite 700
City: Denver
State: Colorado Zip Code: 80209

4. **Facility Name and Physical Address, if different from #2 [NAC 445B.295(1)]:**

Name: South Valley Technology Park
Address: 8990 USA Parkway
City: McCarran
State: NV Zip Code: 89437

5. **If records required under the operating permit will be kept at a location other than the facility, specify that location [NAC 445B.295(7)]:**

Name: _____
Address: _____
City: _____
State: _____ Zip Code: _____

GENERAL COMPANY INFORMATION FORM (continued)

6. Responsible Official Name, Title and Mailing Address [NAC 445B.295(1)]:

Name: Chris Vonderhaar
Title: President, Fleet
Address: 7525 SE 24th Street, Suite 420
City: Mercer Island
State: WA Zip Code: 98040
Phone Number: 1-303-313-3010
Fax Number: _____
E-mail Address: _____

Is this a new Responsible Official? ☒ Yes ☐ No

If yes, and the Responsible Official (RO) does not meet the definition under NAC 445B.156 then please fill out the "Responsible Official Identification/Designation/Change Request Form" and mail it in.

(<https://ndep.nv.gov/air/permitting/download-permit-forms>)

7. Plant Manager or other appropriate Contact Name, Title and Address [NAC 445B.295(1)]:

Name: Michiel Versteeg
Title: Vice President, Health, Safety and Environmental
Address: 7525 SE 24th Street, Suite 420
City: Mercer Island
State: WA Zip Code: 98040
Phone Number: 1-720-552-9182
Fax Number: _____
E-mail Address: _____

8. Location and Driving Directions to the Facility (For Example: From Elko, Nevada, 4 miles south of I-80 at xx Interchange) [NAC 445B.295(8)]:

Hydrographic Basin (HA) Number: 102
Tracy Segment of Truckee River Basin
HA Basin Name: / Storey County

Township(s): 19 N; Range(s): 23 E; Section(s): 33

UTM Coordinates for the Front Gate of the Facility (NAD 83, Zone 11):

4371533 m North; 293415 m East;

Nearest City: Reno, NV

County: Storey

Driving Directions from nearest city to the Facility:

From Reno head east on I-80 and take the right exit for Exit 32- NV 439/USA Pkwy. After 10 miles, use the right lane to take the ramp onto NV-439/USA Pkwy. The site location will be on the right-hand side.

GENERAL COMPANY INFORMATION FORM (continued)

9. **Emission Cap Requested [NAC 445B.070, NAC 445B.296(2), NAC 445B.296(3)]:**
☒ Yes ☐ No (If yes, provide details in the attached Process Narrative) Fleet is requesting a facility-wide natural gas combustion limit applied to the 90 P1 engines and 2 dual-burner LNG vaporizer of 13,250,998 MMBtu/yr HHV. SV RNO is requesting a facility-wide diesel fuel limit applied to the 106 data center engines for non-emergency operations, 4 dual engine black start gensets, 2 substation engines, and 2 fire pump engines, of 2,226,780 gallons/year, 12-month rolling sum, and a limit to below 250 tons/year of each criteria pollutant, 12-month rolling sum.
10. **Important note** for completing the Industrial Process, Combustion Equipment, Storage Silo, and Liquid Storage Tank Application Forms: forms need to be included for all permitted emission units and insignificant activities. Provide additional forms as needed. All items in the application must be addressed. If an item does not apply, then "N/A" or similar notation (TDB, unknown, etc.) must be entered in the appropriate blank.
11. **Check one that applies:**
☐ Major Stationary Source [40 CFR 52.21]
☐ Minor Source [40 CFR 71.2]
☒ New Source Review (NSR) Synthetic Minor Source [40 CFR 49.167]
12. **Is the Facility subject to 40 CFR 51.307 and 52.21(p) (i.e., located within 100 km of a Class I Federal Area within Nevada and any adjacent states, for example Jarbidge Wilderness Area) protected by the Regional Haze Program (40 CFR Part 81)?**
☐ Yes ☒ No
13. **Check any of the following that apply to this application:**
☐ Involve significant changes to the existing requirements for monitoring, reporting, or recordkeeping.
☐ Require or change a determination of an emission limitation or other standard on a case-by-case basis.
☒ Require or change a visibility or increment analysis.
☐ Require or change a determination of ambient impact for any temporary source.
☐ Establish or change a condition of the operating permit for which there is no federally enforceable emissions cap and/or an alternative emission limitation pursuant to U.S.C. Title 42 7412(i)(5).
☐ Result in an increase in allowable emissions that exceeds any of the following specified thresholds: Carbon monoxide, 100 tons per year; Nitrogen oxides, 40 tons per year; Sulfur dioxide (SO₂), 40 tons per year; Particulate Matter less than or equal to 10 microns in diameter (PM₁₀), 15 tons per year; Ozone (O₃), 40 tons per year of volatile organic compounds (VOC); Sulfuric acid mist, 7 tons per year; and Hydrogen sulfide (H₂S), 10 tons per year.
☐ Modification pursuant to any provision of U.S.C. Title 42 7401 to 7515, inclusive, or a major modification at an existing major stationary source.
- If any of the boxes were checked above, a minor revision may not be made to the Class I Operating Permit pursuant to NAC 445B.3425.**

- 14. Will the Facility be constructed in more than one phase [NAC 445B.3395(17)]?**
☐ Yes ☒ No (If yes, provide details in the attached Process Narrative)

GENERAL COMPANY INFORMATION FORM (continued)

15. Will the facility violate any "Applicable requirement" pursuant to NAC 445B.019?

☐ Yes ☒ No

16. Verify facility's compliance status for the following regulations and describe the reason for exemption if applicable:

FEDERALLY ENFORCEABLE REQUIREMENTS			
NAC 445B.225	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.315(3)(h)	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.315(3)(i)	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.315(3)(k)	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
40 CFR 52.21(r)(4)	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.252	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.22067	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.22093	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.22037	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.227	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
40 CFR Parts 60.1-60.19, 61.01-61.19, 61.140-61.157, 63.1-63.15, and 70	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
40 CFR Part 82	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.230	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.22017	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption

STATE REQUIREMENTS			
NRS 445B.470	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.22013	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.326(1)	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 445B.22087	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption
NAC 459.952-459.95528	☒ Compliant	☐ Not Compliant	☐ Exempt, Reason for Exemption

17. Has the facility provided modeling for each non-combustion baghouse individually? (See Testing Determination System for Baghouses Guidance Document)

☐ Yes ☐ No ☒ N/A

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT

System Number and Name: **System 1: P1 Power Plant Engines (90)**

Emission Unit Description: **2,146 bhp Jenbacher J420 Gas-Fired Generators**

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☐ Yes ☒ No If yes, identify exemption regulation: _____

Description			Data
Equipment Description	BAPC Emission Unit ID Applicable for Renewal or Revision	eg. Unit ID: S2.001	See attached table.
	Source Classification Code (SCC)	e.g. 3-03-024-04 for Conveyors	2-02-002-54
	Manufacturer		Jenbacher
	Date Manufactured		TBD
	Model and Serial Number		J420
	Emissions Released Inside building?	yes/no	No
For Reciprocating Internal Combustion Engines (RICE) Only	Type of Engine Code (See Notes*)		SI4SLB
	Date Constructed	month/day/yr	TBD
	Cylinder Displacement	liter/cylinder	3.06
	EPA Tier #		N/A
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m	See attached table.
	UTM Easting (NAD 83, Zone 11)	m	See attached table.
Operating Parameters /Fuel Usage	Fuel Type		Natural Gas
	Fuel Flow Meter Installed?	yes/no/NA	Yes
	Sulfur Content	%	0.0017
	Heat Content	Btu/scf	1020
	Start Time if operating less than 24 hours/day	hour:minute	N/A
	End Time if operating less than 24 hours/day	hour:minute	N/A
Control Equipment	Manufacturer		Miratech
	Manufacturer's Guarantee Included? If "yes", attach manufacturer's sheets immediately after these forms.	yes/N/A	Yes
Stack Parameters	Stack Height	feet	25.0
	Stack Inside Diameter	feet	1.67
	Stack Temperature	°F	819
	Stack Exit Velocity	feet/second	144.587
	Actual Gas Volume Flow Rate	acfm	19,000.9
	Dry Gas Volume Flow Rate If not included in detailed calculations.	dscfm	Not available
	Stack Release Type	☒ vertical ☐ capped ☐ horizontal	

Notes*

Code	Description	Code	Description
LU	Limited Use	E-SI	Emergency Spark Ignition
LDG	Landfill/Digester Gas	SI4SRB	Spark Ignition 4-Stroke Rich Burn
NECI	Non-Emergency Compression Ignition	SI4SLB	Spark Ignition 4-Stroke Lean Burn
ECI	Emergency Compression Ignition	SI2SLB	Spark Ignition 2-Stroke Lean Burn

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: 2,146 bhp Jenbacher J420 Gas-Fired Generators

1. Subject to a Federal Regulation specific to the emission unit (e.g. 40 CFR Part 60, 61, 63, 64, 76, or other):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability and include required analysis or plans (e.g. siting analysis or Continuous Assurance Monitoring (CAM) plans).
NSPS 40 CFR Part 60, Subpart JJJJ - Spark Ignition Engines
NESHAP Subpart ZZZZ - Stationary Reciprocating Internal Combustion Engines

2. Subject to a State Regulation specific to the emission unit (e.g. NAC 445B.2203, NAC 445B.22047, NAC 445B.22017):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability.
NAC 445B.2203(1)(b): Emission unit has a heat input greater than 10 MMBtu/hr but less than 4,000 MMBtu/hr
NAC 445B.2204, 445B.22043, 445.22047(2) and SIP Article 8.1 and 8.2: Equipment - Unit has a heat input less than 250 MMBtu/hr
NAC 445B.22017: Maximum Opacity of Emissions not to exceed 20 percent

3. Identify standards for work practices which affect emissions for all regulated air pollutants (e.g. At all times, including startup, shutdown and malfunction).
 1. At all times, including startup, shutdown and malfunction, operation of the generators will be consistent with good air pollution control practices.
 2. Periodic maintenance on a weekly, monthly, quarterly and annual basis will be conducted to meet or exceed manufacturer's recommendations.

4. Identify and describe compliance and performance testing with reference to any applicable test methods, monitoring devices, compliance plan, or other activities required to determine compliance with an applicable requirement (e.g. Emissions from this unit will be monitored by CEMS and/or COMS for the specific pollutant(s) (NO_x, CO, etc.)).
The generators will be equipped with fuel flow monitoring equipment.

5. How will fuel consumption be monitored for this emission unit? (e.g. maximum fuel consumption rate supplied by manufacturer, fuel flow meter).
The generators will be equipped with fuel flow equipment to monitor fuel consumption.

6. Does this unit have the capability to bypass air pollution controls in an emergency situation as defined under NAC 445B.056?:
☐ **Yes** ☒ **No**

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT

System Number and Name: **System 2: LNG Vaporizers (2)**

Emission Unit Description: **52 MMBtu/hr Liquid Natural Gas Vaporizers, Dual Burner**

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☐ Yes ☒ No If yes, identify exemption regulation: _____

Description			Data
Equipment Description	BAPC Emission Unit ID Applicable for Renewal or Revision	eg. Unit ID: S2.001	See attached table.
	Source Classification Code (SCC)	e.g. 3-03-024-04 for Conveyors	1-01-006-02
	Manufacturer		Stabilis
	Date Manufactured		TBD
	Model and Serial Number		TBD
	Emissions Released Inside building?	yes/no	No
For Reciprocating Internal Combustion Engines (RICE) Only	Type of Engine Code (See Notes*)		N/A
	Date Constructed	month/day/yr	N/A
	Cylinder Displacement	liter/cylinder	N/A
	EPA Tier #		N/A
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m	See attached table.
	UTM Easting (NAD 83, Zone 11)	m	See attached table.
Operating Parameters /Fuel Usage	Fuel Type		Natural Gas
	Fuel Flow Meter Installed?	yes/no/NA	Yes
	Sulfur Content	%	0.0017
	Heat Content	Btu/scf	1020
	Start Time if operating less than 24 hours/day	hour:minute	N/A
	End Time if operating less than 24 hours/day	hour:minute	N/A
Control Equipment	Manufacturer		N/A
	Manufacturer's Guarantee Included? If "yes", attach manufacturer's sheets immediately after these forms.	yes/N/A	N/A
Stack Parameters	Stack Height	feet	22
	Stack Inside Diameter	feet	2 ft per stack
	Stack Temperature	°F	650
	Stack Exit Velocity	feet/second	22.86
	Actual Gas Volume Flow Rate	acfm	28,265.8
	Dry Gas Volume Flow Rate If not included in detailed calculations.	dscfm	Not available
	Stack Release Type	☒ vertical ☐ capped ☐ horizontal	

Notes*

Code	Description	Code	Description
LU	Limited Use	E-SI	Emergency Spark Ignition
LDG	Landfill/Digester Gas	SI4SRB	Spark Ignition 4-Stroke Rich Burn
NECI	Non-Emergency Compression Ignition	SI4SLB	Spark Ignition 4-Stroke Lean Burn
ECI	Emergency Compression Ignition	SI2SLB	Spark Ignition 2-Stroke Lean Burn

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: 52 MMBtu/hr Liquid Natural Gas Vaporizers, Dual Burner

1. Subject to a Federal Regulation specific to the emission unit (e.g. 40 CFR Part 60, 61, 63, 64, 76, or other):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability and include required analysis or plans (e.g. siting analysis or Continuous Assurance Monitoring (CAM) plans).
NSPS Subpart A – General Provisions
2. Subject to a State Regulation specific to the emission unit (e.g. NAC 445B.2203, NAC 445B.22047, NAC 445B.22017):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability.
NAC 445B.2203(1)(b): Emission unit has a heat input greater than 10 MMBtu/hr but less than 4,000 MMBtu/hr
NAC 445B.2204, 445B.22043, 445.22047(2) and SIP Article 8.1 and 8.2: Equipment – Unit has a heat input less than 250 MMBtu/hr
NAC 445B.22017: Maximum Opacity of Emissions not to exceed 20 percent
3. Identify standards for work practices which affect emissions for all regulated air pollutants (e.g. At all times, including startup, shutdown and malfunction).
 1. At all times, including startup, shutdown and malfunction, operation of the vaporizers will be consistent with good air pollution control practices.
 2. Periodic maintenance on a weekly, monthly, quarterly and annual basis will be conducted to meet or exceed manufacturer's recommendations.
4. Identify and describe compliance and performance testing with reference to any applicable test methods, monitoring devices, compliance plan, or other activities required to determine compliance with an applicable requirement (e.g. Emissions from this unit will be monitored by CEMS and/or COMS for the specific pollutant(s) (NO_x, CO, etc.)).
The vaporizers will be equipped with fuel flow monitoring equipment.
5. How will fuel consumption be monitored for this emission unit? (e.g. maximum fuel consumption rate supplied by manufacturer, fuel flow meter).
The vaporizers will be equipped with fuel flow equipment to monitor fuel consumption.
6. Does this unit have the capability to bypass air pollution controls in an emergency situation as defined under NAC 445B.056?:
☐ **Yes** ☒ **No**

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT

System Number and Name: **System 3: Black Start Engine Gensets (4 with dual engines)**

Emission Unit Description: **1,370 kW Tier 4 Volvo Penta Diesel Black Start Engine Gensets**

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☐ Yes ☒ No If yes, identify exemption regulation: _____

Description			Data
Equipment Description	BAPC Emission Unit ID Applicable for Renewal or Revision	eg. Unit ID: S2.001	See attached table.
	Source Classification Code (SCC)	e.g. 3-03-024-04 for Conveyors	
	Manufacturer	Volvo	
	Date Manufactured	TBD	
	Model and Serial Number	TWD1683GE	
	Emissions Released Inside building?	yes/no	
For Reciprocating Internal Combustion Engines (RICE) Only	Type of Engine Code (See Notes*)		ECI
	Date Constructed	month/day/yr	TBD
	Cylinder Displacement	liter/cylinder	2.69
	EPA Tier #		4
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m	See attached table.
	UTM Easting (NAD 83, Zone 11)	m	See attached table.
Operating Parameters /Fuel Usage	Fuel Type		Ultra Low Sulfur Diesel
	Fuel Flow Meter Installed?	yes/no/NA	Yes
	Sulfur Content	%	0.0015
	Heat Content	Btu/gal	140,000
	Start Time if operating less than 24 hours/day	hour:minute	N/A
	End Time if operating less than 24 hours/day	hour:minute	N/A
Control Equipment	Manufacturer		Volvo
	Manufacturer's Guarantee Included? If "yes", attach manufacturer's sheets immediately after these forms.	yes/N/A	Yes
Stack Parameters	Stack Height	feet	9.6
	Stack Inside Diameter	feet	0.667 ft per stack
	Stack Temperature	°F	810
	Stack Exit Velocity	feet/second	58.02
	Actual Gas Volume Flow Rate	acfm	7758.4
	Dry Gas Volume Flow Rate If not included in detailed calculations.	dscfm	Not available
	Stack Release Type	☒ vertical ☐ capped ☐ horizontal	

Notes*

Code	Description	Code	Description
LU	Limited Use	E-SI	Emergency Spark Ignition
LDG	Landfill/Digester Gas	SI4SRB	Spark Ignition 4-Stroke Rich Burn
NECI	Non-Emergency Compression Ignition	SI4SLB	Spark Ignition 4-Stroke Lean Burn
ECI	Emergency Compression Ignition	SI2SLB	Spark Ignition 2-Stroke Lean Burn

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: 1,370 kW Tier 4 Volvo Penta Diesel Black Start Engine Gensets

1. Subject to a Federal Regulation specific to the emission unit (e.g. 40 CFR Part 60, 61, 63, 64, 76, or other):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability and include required analysis or plans (e.g. siting analysis or Continuous Assurance Monitoring (CAM) plans).
NSPS Subpart IIII – Stationary Compression Ignition Internal Combustion Engines
NESHAP Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines
2. Subject to a State Regulation specific to the emission unit (e.g. NAC 445B.2203, NAC 445B.22047, NAC 445B.22017):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability.
NAC 445B.2203(1)(b): Emission unit has a heat input greater than 10 MMBtu/hr but less than 4,000 MMBtu/hr
NAC 445B.2204, 445B.22043, 445.22047(2) and SIP Article 8.1 and 8.2: Equipment – Unit has a heat input less than 250 MMBtu/hr
NAC 445B.22017: Maximum Opacity of Emissions not to exceed 20 percent
3. Identify standards for work practices which affect emissions for all regulated air pollutants (e.g. At all times, including startup, shutdown and malfunction).
 1. At all times, including startup, shutdown and malfunction, operation of the generators will be consistent with good air pollution control practices.
 2. Periodic maintenance on a weekly, monthly, quarterly and annual basis will be conducted to meet or exceed manufacturer's recommendations.
4. Identify and describe compliance and performance testing with reference to any applicable test methods, monitoring devices, compliance plan, or other activities required to determine compliance with an applicable requirement (e.g. Emissions from this unit will be monitored by CEMS and/or COMS for the specific pollutant(s) (NO_x, CO, etc.)).
The generators will be equipped with fuel flow monitoring equipment.
5. How will fuel consumption be monitored for this emission unit? (e.g. maximum fuel consumption rate supplied by manufacturer, fuel flow meter).
The generators will be equipped with fuel flow equipment to monitor fuel consumption.
6. Does this unit have the capability to bypass air pollution controls in an emergency situation as defined under NAC 445B.056?:
☐ **Yes** ☒ **No**

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT

System Number and Name: System 4: Data Center Emergency Backup Engines (106)
Emission Unit Description: 4,393 bhp Tier 4 Caterpillar 3516E (EM4718-02) Diesel-Fired Backup Generator

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☐ Yes ☒ No If yes, identify exemption regulation: _____

Description			Data
Equipment Description	BAPC Emission Unit ID Applicable for Renewal or Revision	eg. Unit ID: S2.001	See attached table.
	Source Classification Code (SCC)	e.g. 3-03-024-04 for Conveyors	2-02-004-01
	Manufacturer		Caterpillar
	Date Manufactured		TBD
	Model and Serial Number		3516E
	Emissions Released Inside building?	yes/no	No
For Reciprocating Internal Combustion Engines (RICE) Only	Type of Engine Code (See Notes*)		ECI
	Date Constructed	month/day/yr	TBD
	Cylinder Displacement	liter/cylinder	4.88
	EPA Tier #		4
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m	See attached table.
	UTM Easting (NAD 83, Zone 11)	m	See attached table.
Operating Parameters /Fuel Usage	Fuel Type		Ultra Low Sulfur Diesel
	Fuel Flow Meter Installed?	yes/no/NA	Yes
	Sulfur Content	%	0.0015
	Heat Content	Btu/gal	140,000
	Start Time if operating less than 24 hours/day	hour:minute	No start time limit
	End Time if operating less than 24 hours/day	hour:minute	No end time limit
Control Equipment	Manufacturer		Caterpillar
	Manufacturer's Guarantee Included? If "yes", attach manufacturer's sheets immediately after these forms.	yes/N/A	Yes
Stack Parameters	Stack Height	feet	60
	Stack Inside Diameter	feet	1
	Stack Temperature	°F	902
	Stack Exit Velocity	feet/second	483.96
	Actual Gas Volume Flow Rate	acfm	22,806.2
	Dry Gas Volume Flow Rate If not included in detailed calculations.	dscfm	Not available
	Stack Release Type		☒ vertical ☐ capped ☐ horizontal

Notes*

Code	Description	Code	Description
LU	Limited Use	E-SI	Emergency Spark Ignition
LDG	Landfill/Digester Gas	SI4SRB	Spark Ignition 4-Stroke Rich Burn
NECI	Non-Emergency Compression Ignition	SI4SLB	Spark Ignition 4-Stroke Lean Burn
ECI	Emergency Compression Ignition	SI2SLB	Spark Ignition 2-Stroke Lean Burn

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: **4,393 bhp Tier 4 Caterpillar 3516E (EM4718-02) Diesel-Fired Backup Generator**

1. Subject to a Federal Regulation specific to the emission unit (e.g. 40 CFR Part 60, 61, 63, 64, 76, or other):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability and include required analysis or plans (e.g. siting analysis or Continuous Assurance Monitoring (CAM) plans).
NSPS Subpart IIII – Stationary Compression Ignition Internal Combustion Engines
NESHAP Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines
2. Subject to a State Regulation specific to the emission unit (e.g. NAC 445B.2203, NAC 445B.22047, NAC 445B.22017):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability.
NAC 445B.2203(1)(b): Emission unit has a heat input greater than 10 MMBtu/hr but less than 4,000 MMBtu/hr
NAC 445B.2204, 445B.22043, 445.22047(2) and SIP Article 8.1 and 8.2: Equipment – Unit has a heat input less than 250 MMBtu/hr
NAC 445B.22017: Maximum Opacity of Emissions not to exceed 20 percent
3. Identify standards for work practices which affect emissions for all regulated air pollutants (e.g. At all times, including startup, shutdown and malfunction).
 1. At all times, including startup, shutdown and malfunction, operation of the generators will be consistent with good air pollution control practices.
 2. Periodic maintenance will be conducted to meet manufacturer's recommendations.
4. Identify and describe compliance and performance testing with reference to any applicable test methods, monitoring devices, compliance plan, or other activities required to determine compliance with an applicable requirement (e.g. Emissions from this unit will be monitored by CEMS and/or COMS for the specific pollutant(s) (NO_x, CO, etc.)).
The generators will be equipped with non-resettable fuel flow meters.
5. How will fuel consumption be monitored for this emission unit? (e.g. maximum fuel consumption rate supplied by manufacturer, fuel flow meter).
The generators will be equipped with non-resettable fuel flow meters to monitor fuel consumption.
6. Does this unit have the capability to bypass air pollution controls in an emergency situation as defined under NAC 445B.056?:
☐ **Yes** ☒ **No**

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT

System Number and Name: **System 5: Substation Engines (2)**

Emission Unit Description: **1.25 MW Tier 2 Caterpillar C32 Diesel-Fired Backup Generator**

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☐ Yes ☒ No If yes, identify exemption regulation: _____

Description			Data
Equipment Description	BAPC Emission Unit ID Applicable for Renewal or Revision	eg. Unit ID: S2.001	See attached table.
	Source Classification Code (SCC)	e.g. 3-03-024-04 for Conveyors	2-02-004-01
	Manufacturer		Caterpillar
	Date Manufactured		TBD
	Model and Serial Number		C32
	Emissions Released Inside building?	yes/no	No
For Reciprocating Internal Combustion Engines (RICE) Only	Type of Engine Code (See Notes*)		ECI
	Date Constructed	month/day/yr	TBD
	Cylinder Displacement	liter/cylinder	2.68
	EPA Tier #		2
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m	See attached table.
	UTM Easting (NAD 83, Zone 11)	m	See attached table.
Operating Parameters /Fuel Usage	Fuel Type		Ultra Low Sulfur Diesel
	Fuel Flow Meter Installed?	yes/no/NA	Yes
	Sulfur Content	%	0.0015
	Heat Content	Btu/gal	140,000
	Start Time if operating less than 24 hours/day	hour:minute	No start time limit
	End Time if operating less than 24 hours/day	hour:minute	No end time limit
Control Equipment	Manufacturer		N/A
	Manufacturer's Guarantee Included? If "yes", attach manufacturer's sheets immediately after these forms.	yes/N/A	N/A
Stack Parameters	Stack Height	feet	15
	Stack Inside Diameter	feet	1.0
	Stack Temperature	°F	806.6
	Stack Exit Velocity	feet/second	212.329
	Actual Gas Volume Flow Rate	acfm	10,005.8
	Dry Gas Volume Flow Rate If not included in detailed calculations.	dscfm	Not available
	Stack Release Type		☒ vertical ☐ capped ☐ horizontal

Notes*

Code	Description	Code	Description
LU	Limited Use	E-SI	Emergency Spark Ignition
LDG	Landfill/Digester Gas	SI4SRB	Spark Ignition 4-Stroke Rich Burn
NECI	Non-Emergency Compression Ignition	SI4SLB	Spark Ignition 4-Stroke Lean Burn
ECI	Emergency Compression Ignition	SI2SLB	Spark Ignition 2-Stroke Lean Burn

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: 1.25 MW Tier 2 Caterpillar C32 Diesel-Fired Backup Generator

1. Subject to a Federal Regulation specific to the emission unit (e.g. 40 CFR Part 60, 61, 63, 64, 76, or other):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability and include required analysis or plans (e.g. siting analysis or Continuous Assurance Monitoring (CAM) plans).
NSPS Subpart IIII – Stationary Compression Ignition Internal Combustion Engines
NESHAP Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines
2. Subject to a State Regulation specific to the emission unit (e.g. NAC 445B.2203, NAC 445B.22047, NAC 445B.22017):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability.
NAC 445B.2203(1)(b): Emission unit has a heat input greater than 10 MMBtu/hr but less than 4,000 MMBtu/hr
NAC 445B.2204, 445B.22043, 445.22047(2) and SIP Article 8.1 and 8.2: Equipment – Unit has a heat input less than 250 MMBtu/hr
NAC 445B.22017: Maximum Opacity of Emissions not to exceed 20 percent
3. Identify standards for work practices which affect emissions for all regulated air pollutants (e.g. At all times, including startup, shutdown and malfunction).
 1. At all times, including startup, shutdown and malfunction, operation of the generators will be consistent with good air pollution control practices.
 2. Periodic maintenance will be conducted to meet manufacturer's recommendations.
4. Identify and describe compliance and performance testing with reference to any applicable test methods, monitoring devices, compliance plan, or other activities required to determine compliance with an applicable requirement (e.g. Emissions from this unit will be monitored by CEMS and/or COMS for the specific pollutant(s) (NO_x, CO, etc.)).
The generators will be equipped with non-resettable fuel flow monitoring equipment.
5. How will fuel consumption be monitored for this emission unit? (e.g. maximum fuel consumption rate supplied by manufacturer, fuel flow meter).
The generators will be equipped with non-resettable fuel flow meters to monitor fuel consumption.
6. Does this unit have the capability to bypass air pollution controls in an emergency situation as defined under NAC 445B.056?:
☐ **Yes** ☒ **No**

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT

System Number and Name: **System 6: Fire Pump Engines (2)**

Emission Unit Description: **488 bhp Tier 3 Clarke C18H0-UFAD12 Diesel-Fired Generator**

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☐ Yes ☒ No If yes, identify exemption regulation: _____

Description			Data
Equipment Description	BAPC Emission Unit ID Applicable for Renewal or Revision	eg. Unit ID: S2.001	See attached table.
	Source Classification Code (SCC)	e.g. 3-03-024-04 for Conveyors	2-01-001-02
	Manufacturer		Clark
	Date Manufactured		TBD
	Model and Serial Number		C18H0-UFAD12
	Emissions Released Inside building?	yes/no	No
For Reciprocating Internal Combustion Engines (RICE) Only	Type of Engine Code (See Notes*)		ECI
	Date Constructed	month/day/yr	TBD
	Cylinder Displacement	liter/cylinder	3.02
	EPA Tier #		3
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m	See attached table.
	UTM Easting (NAD 83, Zone 11)	m	See attached table.
Operating Parameters /Fuel Usage	Fuel Type		Ultra Low Sulfur Diesel
	Fuel Flow Meter Installed?	yes/no/NA	Yes
	Sulfur Content	%	0.0015
	Heat Content	Btu/gal	140,000
	Start Time if operating less than 24 hours/day	hour:minute	No start time limit
	End Time if operating less than 24 hours/day	hour:minute	No end time limit
Control Equipment	Manufacturer		Clark
	Manufacturer's Guarantee Included? If "yes", attach manufacturer's sheets immediately after these forms.	yes/N/A	N/A
Stack Parameters	Stack Height	feet	20.5
	Stack Inside Diameter	feet	0.667
	Stack Temperature	°F	953
	Stack Exit Velocity	feet/second	182.7
	Actual Gas Volume Flow Rate	acfm	3,830
	Dry Gas Volume Flow Rate If not included in detailed calculations.	dscfm	Not available
	Stack Release Type	☒ vertical ☐ capped ☐ horizontal	

Notes*

Code	Description	Code	Description
LU	Limited Use	E-SI	Emergency Spark Ignition
LDG	Landfill/Digester Gas	SI4SRB	Spark Ignition 4-Stroke Rich Burn
NECI	Non-Emergency Compression Ignition	SI4SLB	Spark Ignition 4-Stroke Lean Burn
ECI	Emergency Compression Ignition	SI2SLB	Spark Ignition 2-Stroke Lean Burn

COMBUSTION EQUIPMENT APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: 488 bhp Tier 3 Clarke C18H0-UFAD12 Diesel-Fired Generator

1. Subject to a Federal Regulation specific to the emission unit (e.g. 40 CFR Part 60, 61, 63, 64, 76, or other):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability and include required analysis or plans (e.g. siting analysis or Continuous Assurance Monitoring (CAM) plans).
NSPS Subpart IIII – Stationary Compression Ignition Internal Combustion Engines
NESHAP Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines
2. Subject to a State Regulation specific to the emission unit (e.g. NAC 445B.2203, NAC 445B.22047, NAC 445B.22017):
☒ **Yes** ☐ **No** If yes, identify regulation and applicability.
NAC 445B.2203(1)(b): Emission unit has a heat input greater than 10 MMBtu/hr but less than 4,000 MMBtu/hr
NAC 445B.2204, 445B.22043, 445.22047(2) and SIP Article 8.1 and 8.2: Equipment – Unit has a heat input less than 250 MMBtu/hr
NAC 445B.22017: Maximum Opacity of Emissions not to exceed 20 percent
3. Identify standards for work practices which affect emissions for all regulated air pollutants (e.g. At all times, including startup, shutdown and malfunction).
 1. At all times, including startup, shutdown and malfunction, operation of the generators will be consistent with good air pollution control practices.
 2. Periodic maintenance on a weekly, monthly, quarterly and annual basis will be conducted to meet or exceed manufacturer's recommendations.
4. Identify and describe compliance and performance testing with reference to any applicable test methods, monitoring devices, compliance plan, or other activities required to determine compliance with an applicable requirement (e.g. Emissions from this unit will be monitored by CEMS and/or COMS for the specific pollutant(s) (NO_x, CO, etc.)).
The generators will be equipped with non-resettable fuel flow meters.
5. How will fuel consumption be monitored for this emission unit? (e.g. maximum fuel consumption rate supplied by manufacturer, fuel flow meter).
The generators will be equipped with non-resettable fuel flow meters to monitor fuel consumption.
6. Does this unit have the capability to bypass air pollution controls in an emergency situation as defined under NAC 445B.056?:
☐ **Yes** ☒ **No**

LIQUID STORAGE TANK APPLICATION FORM CLASS I OPERATING PERMIT

System Number and Name: 150-gallon Tanks (108) – Insignificant Activity

Emission Unit Description: 150-gallon diesel fuel storage tank

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☒ Yes ☐ No If yes, identify exemption regulation: NAC 445B.288 2(d)

Description		Data
Equipment Description	BAPC Emission Unit ID <i>Applicable for Renewal or Revision</i>	eg. Unit ID: S2.001, PF1.001 See attached table.
	Source Classification Code (SCC)	e.g. 3-03-024-04 for Conveyors 4-04-001-22
	Manufacturer	TBD
	Date Manufactured	TBD
	Model Number	TBD
	Heated Tank	yes/no No
	Shell Height	feet 2.7
	Shell Length	feet 2.7
	Shell Width	feet 2.7
	Maximum Liquid Height	feet 2.7
	Average Liquid Height	feet 2
	Capacity of Tank	gallons 150
	Shell Color	Aluminum
	Shell Condition	good/poor Good
	Roof Type (Cone, Dome, External, or Internal Floating Roof)	External
	Roof Height	feet N/A
	Roof Color	N/A
	Cone Roof Slope	N/A
	Dome Roof Radius	feet N/A
	True Vapor Pressure of Liquid	psig 0.006
	Reid Vapor Pressure of Liquid	psig 0.1
	Orientation of Tank	Horizontal/Vertical Vertical
	Submerged Fill [NAC 445B.22093(3)]	yes/no Yes
Equipment Dimensions (LxWxH)	feet 2.7 x 2.7 x 2.7	
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m See attached table.
	UTM Easting (NAD 83, Zone 11)	m See attached table.

LIQUID STORAGE TANK APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: 150-gallon diesel fuel storage tank

Description			Data
Operating Parameters	Material Type		Diesel Fuel
	Operating Time per Year	hour/year	100
	Maximum Throughput	gallon/month	1,703
	Maximum Throughput	gallon/year	20,430
Control Equipment	Type of Control		Submerged Fill
	Control Efficiency	%	N/A
	Pollutant(s) Controlled		VOC
	Manufacturer		N/A
	Manufacturer's Guarantee Included?	yes/NA	N/A
Volatile Organic Compounds (VOC) Emissions	Emission Limit	ton/year	N/A
Other Pollutants	Emission Factor (with units)	(insert unit)	N/A
	Emission Factor Reference		N/A
	Emission Limit	pound/hour	N/A
	Emission Limit	ton/year	N/A

LIQUID STORAGE TANKS APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: 150-gallon diesel fuel storage tank

1. Subject to a Federal Regulation specific to the emission unit (e.g. 40 CFR Part 60, 61, 63, 64, 76, or other):
☐ Yes ☒ No If yes, identify regulation and applicability and include required analysis or plans (e.g. siting analysis or Continuous Assurance Monitoring (CAM) plans).
NSPS (40 CFR Part 60) Subpart K and Ka will not apply because the tank is not greater than 40,000-gallon capacity. For NSPS Subpart Kb, there is an exemption for storage tanks that store volatile organic liquids with a maximum true vapor pressure (TVP) that is less than 3.5 kPa (about 0.51 psia). For NSPS Subpart Kc, there is an exemption for storage tanks with TVP less than 1.7 kPa (about 0.25 psia). Based upon EPA AP-42 Table 7.1-2, the TVP of diesel fuel at standard 60F is 0.006. Diesel will be stored at ambient temperature. Therefore, diesel storage will be exempted from NSPS Kb and Kc NSPS.

2. Subject to a State Regulation specific to the emission unit (e.g. NAC 445B.2203, NAC 445B.22047, NAC 445B.22033, NAC 445B.22017, NAC 445B.3363(1)(g)):
☐ Yes ☒ No If yes, identify regulation and applicability.

3. Identify standards for work practices which affect emissions for all regulated air pollutants (e.g. At all times, including startup, shutdown and malfunction).
Use submerged filling techniques or bottom loading to reduce vapor displacement.
Minimize tank turnover and avoid unnecessary transfers

4. Identify and describe compliance and performance testing with reference to any applicable test methods, monitoring devices, compliance plan, or other activities required to determine compliance with an applicable requirement (e.g. Emissions from this unit will be monitored by CEMS and/or COMS for the specific pollutant(s) (NO_x, CO, etc.)).
The facility will maintain records of tank filling and throughput.

LIQUID STORAGE TANK APPLICATION FORM CLASS I OPERATING PERMIT

System Number and Name: 400-gallon Tanks (2) – Insignificant Activity

Emission Unit Description: 400-gallon diesel fuel storage tank

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☒ Yes ☐ No If yes, identify exemption regulation: NAC 445B.288 2(d)

Description		Data
Equipment Description	BAPC Emission Unit ID <i>Applicable for Renewal or Revision</i>	eg. Unit ID: S2.001, PF1.001 See attached table.
	Source Classification Code (SCC)	eg. 3-03-024-04 for Conveyors 4-04-001-22
	Manufacturer	TBD
	Date Manufactured	TBD
	Model Number	TBD
	Heated Tank	yes/no No
	Shell Height	feet 4.5
	Shell Length	feet 4.83
	Shell Width	feet 2.83
	Maximum Liquid Height	feet 4.5
	Average Liquid Height	feet 2.5
	Capacity of Tank	gallons 400
	Shell Color	Aluminum
	Shell Condition	good/poor Good
	Roof Type (Cone, Dome, External, or Internal Floating Roof)	External
	Roof Height	feet N/A
	Roof Color	N/A
	Cone Roof Slope	N/A
	Dome Roof Radius	feet N/A
	True Vapor Pressure of Liquid	psig 0.006
	Reid Vapor Pressure of Liquid	psig 0.1
	Orientation of Tank	Horizontal/Vertical Vertical
	Submerged Fill [NAC 445B.22093(3)]	yes/no Yes
Equipment Dimensions (LxWxH)	feet 4.83 x 2.83 x 4.5	
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m See attached table.
	UTM Easting (NAD 83, Zone 11)	m See attached table.

LIQUID STORAGE TANK APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: 400-gallon diesel fuel storage tank

Description			Data
Operating Parameters	Material Type		Diesel Fuel
	Operating Time per Year	hour/year	40
	Maximum Throughput	gallon/month	105
	Maximum Throughput	gallon/year	1,260
Control Equipment	Type of Control		Submerged Fill
	Control Efficiency	%	N/A
	Pollutant(s) Controlled		VOC
	Manufacturer		N/A
	Manufacturer's Guarantee Included?	yes/NA	N/A
Volatile Organic Compounds (VOC) Emissions	Emission Limit	ton/year	N/A
Other Pollutants	Emission Factor (with units)	(insert unit)	N/A
	Emission Factor Reference		N/A
	Emission Limit	pound/hour	N/A
	Emission Limit	ton/year	N/A

LIQUID STORAGE TANKS APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: 400-gallon diesel fuel storage tank

1. Subject to a Federal Regulation specific to the emission unit (e.g. 40 CFR Part 60, 61, 63, 64, 76, or other):
☐ Yes ☒ No If yes, identify regulation and applicability and include required analysis or plans (e.g. siting analysis or Continuous Assurance Monitoring (CAM) plans).
NSPS (40 CFR Part 60) Subpart K and Ka will not apply because the tank is not greater than 40,000-gallon capacity. For NSPS Subpart Kb, there is an exemption for storage tanks that store volatile organic liquids with a maximum true vapor pressure (TVP) that is less than 3.5 kPa (about 0.51 psia). For NSPS Subpart Kc, there is an exemption for storage tanks with TVP less than 1.7 kPa (about 0.25 psia). Based upon EPA AP-42 Table 7.1-2, the TVP of diesel fuel at standard 60F is 0.006. Diesel will be stored at ambient temperature. Therefore, diesel storage will be exempted from NSPS Kb and Kc NSPS.

2. Subject to a State Regulation specific to the emission unit (e.g. NAC 445B.2203, NAC 445B.22047, NAC 445B.22033, NAC 445B.22017, NAC 445B.3363(1)(g)):
☐ Yes ☒ No If yes, identify regulation and applicability.

3. Identify standards for work practices which affect emissions for all regulated air pollutants (e.g. At all times, including startup, shutdown and malfunction).
Use submerged filling techniques or bottom loading to reduce vapor displacement.
Minimize tank turnover and avoid unnecessary transfers

4. Identify and describe compliance and performance testing with reference to any applicable test methods, monitoring devices, compliance plan, or other activities required to determine compliance with an applicable requirement (e.g. Emissions from this unit will be monitored by CEMS and/or COMS for the specific pollutant(s) (NO_x, CO, etc.)).
The facility will maintain records of tank filling and throughput.

LIQUID STORAGE TANK APPLICATION FORM CLASS I OPERATING PERMIT

System Number and Name: 1,240-gallon Tanks (4) - Insignificant Activity

Emission Unit Description: 1,240-gallon diesel fuel storage tank

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☒ Yes ☐ No If yes, identify exemption regulation: NAC 445B.288 2(d)

Description		Data	
Equipment Description	BAPC Emission Unit ID Applicable for Renewal or Revision	eg. Unit ID: S2.001, PF1.001 See attached table.	
	Source Classification Code (SCC)	eg. 3-03-024-04 for Conveyors 4-04-001-22	
	Manufacturer		TBD
	Date Manufactured		TBD
	Model Number		TBD
	Heated Tank	yes/no	No
	Shell Height	feet	7
	Shell Length	feet	6
	Shell Width	feet	4
	Maximum Liquid Height	feet	7
	Average Liquid Height	feet	3.5
	Capacity of Tank	gallons	1240
	Shell Color		Aluminum
	Shell Condition	good/poor	Good
	Roof Type (Cone, Dome, External, or Internal Floating Roof)		External
	Roof Height	feet	N/A
	Roof Color		N/A
	Cone Roof Slope		N/A
	Dome Roof Radius	feet	N/A
	True Vapor Pressure of Liquid	psig	0.006
	Reid Vapor Pressure of Liquid	psig	0.1
	Orientation of Tank	Horizontal/Vertical	Vertical
	Submerged Fill [NAC 445B.22093(3)]	yes/no	Yes
Equipment Dimensions (LxWxH)	feet	6 x 4 x 7	
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m See attached table.	
	UTM Easting (NAD 83, Zone 11)	m See attached table.	

LIQUID STORAGE TANK APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: 1,240-gallon diesel fuel storage tank

Description			Data
Operating Parameters	Material Type		Diesel Fuel
	Operating Time per Year	hour/year	100
	Maximum Throughput	gallon/month	429
	Maximum Throughput	gallon/year	5,150
Control Equipment	Type of Control		Submerged Fill
	Control Efficiency	%	N/A
	Pollutant(s) Controlled		VOC
	Manufacturer		N/A
	Manufacturer's Guarantee Included?	yes/NA	N/A
Volatile Organic Compounds (VOC) Emissions	Emission Limit	ton/year	N/A
Other Pollutants	Emission Factor (with units)	(insert unit)	N/A
	Emission Factor Reference		N/A
	Emission Limit	pound/hour	N/A
	Emission Limit	ton/year	N/A

LIQUID STORAGE TANKS APPLICATION FORM CLASS I OPERATING PERMIT (continued)

Emission Unit Description: 1,240-gallon diesel fuel storage tank

1. Subject to a Federal Regulation specific to the emission unit (e.g. 40 CFR Part 60, 61, 63, 64, 76, or other):
☐ Yes ☒ No If yes, identify regulation and applicability and include required analysis or plans (e.g. siting analysis or Continuous Assurance Monitoring (CAM) plans).
NSPS (40 CFR Part 60) Subpart K and Ka will not apply because the tank is not greater than 40,000-gallon capacity. For NSPS Subpart Kb, there is an exemption for storage tanks that store volatile organic liquids with a maximum true vapor pressure (TVP) that is less than 3.5 kPa (about 0.51 psia). For NSPS Subpart Kc, there is an exemption for storage tanks with TVP less than 1.7 kPa (about 0.25 psia). Based upon EPA AP-42 Table 7.1-2, the TVP of diesel fuel at standard 60F is 0.006. Diesel will be stored at ambient temperature. Therefore, diesel storage will be exempted from NSPS Kb and Kc NSPS.

2. Subject to a State Regulation specific to the emission unit (e.g. NAC 445B.2203, NAC 445B.22047, NAC 445B.22033, NAC 445B.22017, NAC 445B.3363(1)(g)):
☐ Yes ☒ No If yes, identify regulation and applicability.

3. Identify standards for work practices which affect emissions for all regulated air pollutants (e.g. At all times, including startup, shutdown and malfunction).
Use submerged filling techniques or bottom loading to reduce vapor displacement.
Minimize tank turnover and avoid unnecessary transfers

4. Identify and describe compliance and performance testing with reference to any applicable test methods, monitoring devices, compliance plan, or other activities required to determine compliance with an applicable requirement (e.g. Emissions from this unit will be monitored by CEMS and/or COMS for the specific pollutant(s) (NO_x, CO, etc.)).
The facility will maintain records of tank filling and throughput.

COMBUSTION EQUIPMENT DETAILED CALCULATIONS, PER ENGINE

[illegible]

COMBUSTION EQUIPMENT DETAILED CALCULATIONS, PER ENGINE

Area	Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Power Output		Controls		Emissions					References	Number of Units	
			Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Amount	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)			
System No. & Name:			System 3: Black Start Engine Gensets for Prime Power Engines											Uncontrolled							
Prime Power Yard	BSE1 - BSE4	Volvo Penta T4 1,370 kW Diesel-Fueled Black Start Engine Gensets	1	100	14.15	1,415	103.0	10,300	Gallons	1,864	BHP	OxCat SCR Particulate Filter	Tier 4 control efficiencies provided by vendor in emission factors	PM	0.014	g/kWh	0.041	0.002	Vendor	4	
														PM ₁₀	0.014	g/kWh	0.041	0.002	Vendor		
														PM _{2.5}	0.014	g/kWh	0.041	0.002	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.021	0.0011	AP-42 3.4		
														NO _x	0.40	g/kWh	1.21	0.06	Vendor		
														CO	0.07	g/kWh	0.20	0.010	Vendor		
														VOC	0.013	g/kWh	0.04	0.002	Vendor		
														Pb	--	--	--	--	--		
														Hg	--	--	--	--	--		
														H ₂ S	--	--	--	--	--		
														Controlled							
														PM	0.014	g/kWh	0.041	0.002	Vendor		
														PM ₁₀	0.014	g/kWh	0.041	0.002	Vendor		
														PM _{2.5}	0.014	g/kWh	0.041	0.002	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.021	0.0011	AP-42 3.4		
														NO _x	0.40	g/kWh	1.21	0.06	Vendor		
														CO	0.07	g/kWh	0.20	0.01	Vendor		
														VOC	0.013	g/kWh	0.04	0.002	Vendor		
														Pb	--	--	--	--	--		
														Hg	--	--	--	--	--		
														H ₂ S	--	--	--	--	--		
System No. & Name:			System 4: Generator Building A Engines											Uncontrolled							
DC Generator Building A	DC1A_01 - DC1A_24	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204.3	20,430	Gallons	4,393	BHP	OxCat SCR Particulate Filter	NO _x 95%, CO 89%, PM 66.7%	PM	0.06	g/hp-hr	0.58	0.029	Vendor	24	
														PM ₁₀	0.06	g/hp-hr	0.58	0.029	Vendor		
														PM _{2.5}	0.06	g/hp-hr	0.58	0.029	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.04	0.002	AP-42 3.4		
														NO _x	6.76	g/hp-hr	65.5	3.27	Vendor		
														CO	1.20	g/hp-hr	11.6	0.58	Vendor		
														VOC	0.06	g/hp-hr	0.58	0.03	Vendor		
														Pb	--	--	--	--	--		
														Hg	--	--	--	--	--		
														H ₂ S	--	--	--	--	--		
														Controlled							
														PM	0.02	g/hp-hr	0.19	0.010	Vendor		
														PM ₁₀	0.02	g/hp-hr	0.19	0.010	Vendor		
														PM _{2.5}	0.02	g/hp-hr	0.19	0.010	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.04	0.002	AP-42 3.4		
														NO _x	0.34	g/hp-hr	3.27	0.16	Vendor		
														CO	0.13	g/hp-hr	1.28	0.06	Vendor		
														VOC	0.06	g/hp-hr	0.58	0.03	Vendor		
														Pb	--	--	--	--	--		
														Hg	--	--	--	--	--		
														H ₂ S	--	--	--	--	--		

COMBUSTION EQUIPMENT DETAILED CALCULATIONS, PER ENGINE

Area	Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Power Output		Controls		Emissions				References	Number of Units		
			Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Amount	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)			Yearly Rate (tons/yr)	
System No. & Name:			System 4: Generator Building B Engines											Uncontrolled							
DC Generator Building B	DC1B-01 - DC1B-29	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204.3	20,430	Gallons	4,393	BHP	OxCat SCR Particulate Filter	NOx: 95%, CO: 89%, PM: 66.7%	PM	0.06	g/hp-hr	0.58	0.029	Vendor	29	
														PM ₁₀	0.06	g/hp-hr	0.58	0.029	Vendor		
														PM _{2.5}	0.06	g/hp-hr	0.58	0.029	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.04	0.002	AP-42 3.4		
														NOx	6.76	g/hp-hr	65.5	3.27	Vendor		
														CO	1.20	g/hp-hr	11.6	0.58	Vendor		
														VOC	0.06	g/hp-hr	0.58	0.03	Vendor		
														Pb	---	---	---	---	---		
														Hg	---	---	---	---	---		
														H ₂ S	---	---	---	---	---		
														Controlled							
														PM	0.02	g/hp-hr	0.19	0.010	Vendor		
														PM ₁₀	0.02	g/hp-hr	0.19	0.010	Vendor		
														PM _{2.5}	0.02	g/hp-hr	0.19	0.010	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.04	0.002	AP-42 3.4		
														NOx	0.34	g/hp-hr	3.27	0.16	Vendor		
														CO	0.13	g/hp-hr	1.28	0.06	Vendor		
														VOC	0.06	g/hp-hr	0.58	0.03	Vendor		
														Pb	---	---	---	---	---		
														Hg	---	---	---	---	---		
														H ₂ S	---	---	---	---	---		
System No. & Name:			System 4: Generator Building C Engines											Uncontrolled							
DC Generator Building C	DC1C-01 - DC1C-24	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204.3	20,430	Gallons	4,393	BHP	OxCat SCR Particulate Filter	NOx: 95%, CO: 89%, PM: 66.7%	PM	0.06	g/hp-hr	0.58	0.029	Vendor	24	
														PM ₁₀	0.06	g/hp-hr	0.58	0.029	Vendor		
														PM _{2.5}	0.06	g/hp-hr	0.58	0.029	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.04	0.002	AP-42 3.4		
														NOx	6.76	g/hp-hr	65.5	3.27	Vendor		
														CO	1.20	g/hp-hr	11.6	0.58	Vendor		
														VOC	0.06	g/hp-hr	0.58	0.03	Vendor		
														Pb	---	---	---	---	---		
														Hg	---	---	---	---	---		
														H ₂ S	---	---	---	---	---		
														Controlled							
														PM	0.02	g/hp-hr	0.19	0.010	Vendor		
														PM ₁₀	0.02	g/hp-hr	0.19	0.010	Vendor		
														PM _{2.5}	0.02	g/hp-hr	0.19	0.010	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.04	0.002	AP-42 3.4		
														NOx	0.34	g/hp-hr	3.27	0.16	Vendor		
														CO	0.13	g/hp-hr	1.28	0.06	Vendor		
														VOC	0.06	g/hp-hr	0.58	0.03	Vendor		
														Pb	---	---	---	---	---		
														Hg	---	---	---	---	---		
														H ₂ S	---	---	---	---	---		

COMBUSTION EQUIPMENT DETAILED CALCULATIONS, PER ENGINE

Area	Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Power Output		Controls		Emissions					References	Number of Units	
			Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Amount	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lb/hr)	Yearly Rate (tons/yr)			
System No. & Name:			System 4: Generator Building D Engines											Uncontrolled							
DC Generator Building D	DC1D_01 - DC1D_29	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204.3	20,430	Gallons	4,393	BHP	OxCat SCR Particulate Filter	NOx: 95%, CO: 89%, PM: 66.7%	PM	0.06	g/hp-hr	0.58	0.029	Vendor	29	
														PM ₁₀	0.06	g/hp-hr	0.58	0.029	Vendor		
														PM _{2.5}	0.06	g/hp-hr	0.58	0.029	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.04	0.0021	AP-42 3.4		
														NOx	6.76	g/hp-hr	65.5	3.27	Vendor		
														CO	1.20	g/hp-hr	11.6	0.58	Vendor		
														VOC	0.06	g/hp-hr	0.58	0.03	Vendor		
														Pb	--	--	--	--	--		
														Hg	--	--	--	--	--		
														H ₂ S	--	--	--	--	--		
														Controlled							
														PM	0.02	g/hp-hr	0.19	0.010	Vendor		
														PM ₁₀	0.02	g/hp-hr	0.19	0.010	Vendor		
														PM _{2.5}	0.02	g/hp-hr	0.19	0.010	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.04	0.002	AP-42 3.4		
														NOx	0.34	g/hp-hr	3.27	0.16	Vendor		
														CO	0.13	g/hp-hr	1.28	0.06	Vendor		
														VOC	0.06	g/hp-hr	0.58	0.03	Vendor		
														Pb	--	--	--	--	--		
														Hg	--	--	--	--	--		
														H ₂ S	--	--	--	--	--		
System No. & Name:			System 5: Substation Engines											Uncontrolled							
Substation	C32_1 - C32_2	Tier 2 Caterpillar C32 1.25 MW Diesel-Fired Generator	1	100	12.0	1,197	87.4	8,740	Gallons	1,676	BHP	None	N/A	PM	0.02	g/hp-hr	0.07	0.004	Vendor	2	
														PM ₁₀	0.02	g/hp-hr	0.07	0.004	Vendor		
														PM _{2.5}	0.02	g/hp-hr	0.07	0.004	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.02	0.0009	AP-42 3.4		
														NOx	6.2	g/hp-hr	22.9	1.15	Vendor		
														CO	0.21	g/hp-hr	0.78	0.04	Vendor		
														VOC	0.10	g/hp-hr	0.37	0.02	Vendor		
														Pb	--	--	--	--	--		
														Hg	--	--	--	--	--		
														H ₂ S	--	--	--	--	--		
														Controlled							
														PM	0.02	g/hp-hr	0.07	0.00	Vendor		
														PM ₁₀	0.02	g/hp-hr	0.07	0.00	Vendor		
														PM _{2.5}	0.02	g/hp-hr	0.07	0.00	Vendor		
														SO ₂	0.0015	lb/MMBtu	0.02	0.0009	AP-42 3.4		
														NOx	6.2	g/hp-hr	22.9	1.15	Vendor		
														CO	0.21	g/hp-hr	0.78	0.04	Vendor		
														VOC	0.10	g/hp-hr	0.37	0.02	Vendor		
														Pb	--	--	--	--	--		
														Hg	--	--	--	--	--		
														H ₂ S	--	--	--	--	--		

COMBUSTION EQUIPMENT DETAILED CALCULATIONS, PER ENGINE

Area	Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Power Output		Controls		Emissions					References	Number of Units
			Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Amount	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)		
System No. & Name:			System 6: Fire Pump Engines																	
Fire Command Center	FIRE_1 - FIRE_2	Tier 3 UFAD12 364 kW Clark Diesel-Fired Fire Pump Engine	1	40	4.32	173	31.5	1,260	Gallons	488	BHP	None	N/A	Uncontrolled					2	
														PM	0.199	g/kWh	0.16	0.003		Vendor
														PM ₁₀	0.199	g/kWh	0.16	0.003		Vendor
														PM _{2.5}	0.199	g/kWh	0.16	0.003		Vendor
														SO ₂	0.0021	lb/hp-hr	1.00	0.020		AP-42 3.3
														NO _x	2.94	g/kWh	2.36	0.05		Vendor
														CO	1.9	g/kWh	1.52	0.03		Vendor
														VOC	0.17	g/kWh	0.14	0.003		Vendor
														Pb	--	--	--	--		--
														Hg	--	--	--	--		--
														H ₂ S	--	--	--	--		--
														Controlled						
														PM	0.199	g/kWh	0.16	0.003		Vendor
														PM ₁₀	0.199	g/kWh	0.16	0.003		Vendor
														PM _{2.5}	0.199	g/kWh	0.16	0.003		Vendor
														SO ₂	0.0021	lb/hp-hr	1.00	0.020		AP-42 3.3
														NO _x	2.94	g/kWh	2.36	0.05		Vendor
														CO	1.9	g/kWh	1.52	0.03		Vendor
														VOC	0.17	g/kWh	0.14	0.003		Vendor
														Pb	--	--	--	--		--
														Hg	--	--	--	--		--
H ₂ S	--	--	--	--	--															

GREENHOUSE GASES (GHG) DETAILED CALCULATIONS, PER UNIT

Area	Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Power Output		Controls		Emissions per Unit					References	Number of Units	
			Daily	Annual	Hourly (MMBtu/hr)	Annual (MMBtu/yr)	Hourly	Annual	Units	Amount	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lb/hr)	Yearly Rate (tons/yr)			
System No. & Name:			System 1: P1 Power Plant Engines																		
Prime Power Yard	J420_01 - J420_90	Jenbacher J420 1.6 MW Natural Gas-Fueled Engine	24	8,760	14.23	124,646	16,245	142,306,200	SCF	2,146	BHP	OxCat SCR	N/A	CO ₂	1.10E+02	lb/MMBtu	1.57E+03	6.86E+03	AP-42 Table 3.2	90	
														CH ₄	2.20E-03	lb/MMBtu	3.14E-02	1.37E-01			1
														N ₂ O	2.20E-04	lb/MMBtu	3.14E-03	1.37E-02			1
														CO _{2e}			1.57E+03	6.86E+03			1
System No. & Name:			System 2: Liquefied Natural Gas Vaporizers																		
Prime Power Yard	VAP1 - VAP2	Stabilis Dual Burner Liquid Natural Gas (LNG) Vaporizer	24	8,760	52.0	455,520	0.0510	447	MMscf	N/A	N/A	None	N/A	CO ₂	9.00E-02	lb/MMBtu	4.68E+00	2.05E+01	Vendor	2	
														CH ₄	2.20E-03	lb/MMBtu	1.15E-01	5.02E-01			1
														N ₂ O	2.20E-04	lb/MMBtu	1.15E-02	5.02E-02			1
														CO _{2e}			1.09E+01	4.79E+01			1
System No. & Name:			System 3: Black Start Engine Gensets for Prime Power Engines																		
Prime Power Yard	BSE1 - BSE4	Volvo Penta T4 1,370 kW Diesel-Fueled Black Start Engine Gensets	1	100	14.15	1415	103.0	10,300	Gallons	1864	BHP	OxCat SCR Particulate Filter	N/A	CO ₂	1.65E+02	lb/MMBtu	2.33E+03	1.17E+02	AP-42 Table 3.4	4	
														CH ₄	6.61E-03	lb/MMBtu	9.36E-02	4.68E-03			1
														N ₂ O	1.32E-03	lb/MMBtu	1.87E-02	9.36E-04			1
														CO _{2e}			2.34E+03	1.17E+02			1
System No. & Name:			System 4: Generator Building A Engines																		
DC Generator Building A	DC1A_01 - DC1A_24	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204	20,430	Gallons	4,393	BHP	OxCat SCR Particulate Filter	N/A	CO ₂	1.65E+02	lb/MMBtu	4.63E+03	2.32E+02	AP-42, Table 3.4-1	24	
														CH ₄	6.61E-03	lb/MMBtu	1.86E-01	9.28E-03			1
														N ₂ O	1.32E-03	lb/MMBtu	3.71E-02	1.86E-03			1
														CO _{2e}			4.65E+03	2.32E+02			1
System No. & Name:			System 4: Generator Building B Engines																		
DC Generator Building B	DC1B_01 - DC1B_29	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204	20,430	Gallons	4,393	BHP	OxCat SCR Particulate Filter	N/A	CO ₂	1.65E+02	lb/MMBtu	4.63E+03	2.32E+02	AP-42, Table 3.4-1	29	
														CH ₄	6.61E-03	lb/MMBtu	1.86E-01	9.28E-03			1
														N ₂ O	1.32E-03	lb/MMBtu	3.71E-02	1.86E-03			1
														CO _{2e}			4.65E+03	2.32E+02			1
System No. & Name:			System 4: Generator Building C Engines																		
DC Generator Building C	DC1C_01 - DC1C_24	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204	20,430	Gallons	4,393	BHP	OxCat SCR Particulate Filter	N/A	CO ₂	1.65E+02	lb/MMBtu	4.63E+03	2.32E+02	AP-42, Table 3.4-1	24	
														CH ₄	6.61E-03	lb/MMBtu	1.86E-01	9.28E-03			1
														N ₂ O	1.32E-03	lb/MMBtu	3.71E-02	1.86E-03			1
														CO _{2e}			4.65E+03	2.32E+02			1
System No. & Name:			System 4: Generator Building D Engines																		
DC Generator Building D	DC1D_01 - DC1D_29	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204	20,430	Gallons	4,393	BHP	OxCat SCR Particulate Filter	N/A	CO ₂	1.65E+02	lb/MMBtu	4.63E+03	2.32E+02	AP-42, Table 3.4-1	29	
														CH ₄	6.61E-03	lb/MMBtu	1.86E-01	9.28E-03			1
														N ₂ O	1.32E-03	lb/MMBtu	3.71E-02	1.86E-03			1
														CO _{2e}			4.65E+03	2.32E+02			1
System No. & Name:			System 5: Substation Engines																		
Substation	C32_1 - C32_2	Tier 2 Caterpillar C32 1.25 MW Diesel-Fired Generator	1	100	12.0	1,197	87.4	8,740	Gallons	1,676	BHP	None	N/A	CO ₂	1.65E+02	lb/MMBtu	1.98E+03	9.88E+01	AP-42, Table 3.4-1	2	
														CH ₄	6.61E-03	lb/MMBtu	7.92E-02	3.96E-03			1
														N ₂ O	1.32E-03	lb/MMBtu	1.58E-02	7.92E-04			1
														CO _{2e}			1.98E+03	9.91E+01			1
System No. & Name:			System 6: Fire Pump Engines																		
Fire Command Center	FIRE_1 - FIRE_2	Tier 3 UFAD12 364 kW Clark Diesel-Fired Fire Pump Engine	1	40	4.32	173	31.5	1260	Gallons	488	BHP	None	N/A	CO ₂	1.64E+02	lb/MMBtu	7.08E+02	1.42E+01	AP-42, Table 3.3-1	2	
														CH ₄	6.61E-03	lb/MMBtu	2.85E-02	5.71E-04			1
														N ₂ O	1.32E-03	lb/MMBtu	5.71E-03	1.14E-04			1
														CO _{2e}			7.10E+02	1.42E+01			1

1. Emission Factors for Greenhouse Gas Inventories, June 2024 <https://www.epa.gov/system/files/documents/2024/02/ghg-emission-factors-hub-2024.pdf>

HAZARDOUS AIR POLLUTANTS (HAPS) DETAILED CALCULATIONS, PER ENGINE

Area	Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Power Output		Controls		Emissions					References	Number of Units
			Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Amount	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lb/hr)	Yearly Rate (tons/yr)		
System No. & Name			System I: P1 Power Plant Engines																	
Prime Power Yard	J420-01 - J420-90	Jenbacher J420 1.6 MW Natural Gas-Fueled Engine	24	8,760	14.23	124,646	16,245	142,306,200	SCF	2,146	BHP	Ox Cat SCR	VOC: 80%, Formaldehyde 90%	1,1,2,2-Tetrachloroethane	4.00E-05	lb/MMBtu	1.14E-04	4.99E-04	AP-42 Table 3.2-2	
														1,1,2-Trichloroethane	3.18E-05	lb/MMBtu	9.05E-05	3.96E-04	AP-42 Table 3.2-2	
														1,3-Butadiene	2.67E-04	lb/MMBtu	7.60E-04	3.33E-03	AP-42 Table 3.2-2	
														1,3-Dichloropropene	2.64E-05	lb/MMBtu	7.51E-05	3.29E-04	AP-42 Table 3.2-2	
														2,2,4-Trimethylpentane	2.50E-04	lb/MMBtu	7.11E-04	3.12E-03	AP-42 Table 3.2-2	
														2-Methylnaphthalene	3.32E-05	lb/MMBtu	9.45E-05	4.14E-04	AP-42 Table 3.2-2	
														Acenaphthene	1.25E-06	lb/MMBtu	3.56E-06	1.56E-05	AP-42 Table 3.2-2	
														Acenaphthylene	5.53E-06	lb/MMBtu	1.57E-05	6.89E-05	AP-42 Table 3.2-2	
														Benzene	4.40E-04	lb/MMBtu	1.25E-03	5.48E-03	AP-42 Table 3.2-2	
														Benzo(b)fluoranthene	1.66E-07	lb/MMBtu	4.72E-07	2.07E-06	AP-42 Table 3.2-2	
														Benzo(e)pyrene	4.15E-07	lb/MMBtu	1.18E-06	5.17E-06	AP-42 Table 3.2-2	
														Benzo(g,h,i)perylene	4.14E-07	lb/MMBtu	1.18E-06	5.16E-06	AP-42 Table 3.2-2	
														Biphenyl	2.12E-04	lb/MMBtu	6.03E-04	2.64E-03	AP-42 Table 3.2-2	
														Carbon Tetrachloride	3.67E-05	lb/MMBtu	1.04E-04	4.57E-04	AP-42 Table 3.2-2	
														Chlorobenzene	3.04E-05	lb/MMBtu	8.65E-05	3.79E-04	AP-42 Table 3.2-2	
														Chloroform	2.85E-05	lb/MMBtu	8.11E-05	3.55E-04	AP-42 Table 3.2-2	
														Chrysene	6.93E-07	lb/MMBtu	1.97E-06	8.64E-06	AP-42 Table 3.2-2	
														Ethylbenzene	3.97E-05	lb/MMBtu	1.13E-04	4.95E-04	AP-42 Table 3.2-2	
														Ethylene Dibromide	4.43E-05	lb/MMBtu	1.26E-04	5.52E-04	AP-42 Table 3.2-2	
														Fluoranthene	1.11E-06	lb/MMBtu	3.16E-06	1.38E-05	AP-42 Table 3.2-2	
														Fluorene	5.67E-06	lb/MMBtu	1.61E-05	7.07E-05	AP-42 Table 3.2-2	
														Formaldehyde	2.00E-01	g/hp-hr	9.46E-02	4.14E-01	Vendor	
														Methanol	2.50E-03	lb/MMBtu	7.11E-03	3.12E-02	AP-42 Table 3.2-2	
														Methylene Chloride	2.00E-05	lb/MMBtu	5.69E-05	2.49E-04	AP-42 Table 3.2-2	
														n-Hexane	1.11E-03	lb/MMBtu	3.16E-03	1.38E-02	AP-42 Table 3.2-2	
														Naphthalene	7.44E-05	lb/MMBtu	2.12E-04	9.27E-04	AP-42 Table 3.2-2	
														Total PAH	2.69E-05	lb/MMBtu	7.66E-05	3.35E-04	AP-42 Table 3.2-2	
														Phenanthrene	1.04E-05	lb/MMBtu	2.96E-05	1.30E-04	AP-42 Table 3.2-2	
														Phenol	2.40E-05	lb/MMBtu	6.83E-05	2.99E-04	AP-42 Table 3.2-2	
														Pyrene	1.36E-06	lb/MMBtu	3.87E-06	1.70E-05	AP-42 Table 3.2-2	
														Styrene	2.36E-05	lb/MMBtu	6.72E-05	2.94E-04	AP-42 Table 3.2-2	
														Perchloroethylene	2.48E-06	lb/MMBtu	7.06E-06	3.09E-05	AP-42 Table 3.2-2	
														Toluene	4.08E-04	lb/MMBtu	1.16E-03	5.09E-03	AP-42 Table 3.2-2	
														Vinyl Chloride	1.49E-05	lb/MMBtu	4.24E-05	1.86E-04	AP-42 Table 3.2-2	
														Xylenes	1.84E-04	lb/MMBtu	5.24E-04	2.29E-03	AP-42 Table 3.2-2	

HAZARDOUS AIR POLLUTANTS (HAPS) DETAILED CALCULATIONS, PER ENGINE

Area	Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Power Output		Controls		Emissions					References	Number of Units
			Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Amount	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lb/hr)	Yearly Rate (tons/yr)		
System No. & Name			System 2: Liquefied Natural Gas Vaporizers																	
Prime Power Yard	VAP1 - VAP2	Stabilis Dual Burner Liquid Natural Gas (LNG) Vaporizer	24	8,760	52.0	455,520	0.0510	447	MMscf	N/A	N/A	None	N/A	2-Methylnaphthalene	2.40E-05	lb/MMscf	1.22E-06	5.36E-06	AP-42 Table 1.4-3	2
														3-Methylcholanthrene	1.80E-06	lb/MMscf	9.18E-08	4.02E-07	AP-42 Table 1.4-3	
														7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	8.16E-07	3.57E-06	AP-42 Table 1.4-3	
														Acenaphthene	1.80E-06	lb/MMscf	9.18E-08	4.02E-07	AP-42 Table 1.4-3	
														Acenaphthylene	1.80E-06	lb/MMscf	9.18E-08	4.02E-07	AP-42 Table 1.4-3	
														Anthracene	2.40E-06	lb/MMscf	1.22E-07	5.36E-07	AP-42 Table 1.4-3	
														Benz(a)anthracene	1.80E-06	lb/MMscf	9.18E-08	4.02E-07	AP-42 Table 1.4-3	
														Benzene	2.10E-03	lb/MMscf	1.07E-04	4.69E-04	AP-42 Table 1.4-3	
														Benz(a)pyrene	1.20E-06	lb/MMscf	6.12E-08	2.68E-07	AP-42 Table 1.4-3	
														Benz(b)fluoranthene	1.80E-06	lb/MMscf	9.18E-08	4.02E-07	AP-42 Table 1.4-3	
														Chrysene	1.80E-06	lb/MMscf	9.18E-08	4.02E-07	AP-42 Table 1.4-3	
														Dibenz(a,h)anthracene	1.20E-06	lb/MMscf	6.12E-08	2.68E-07	AP-42 Table 1.4-3	
														Dichlorobenzene	1.20E-03	lb/MMscf	6.12E-05	2.68E-04	AP-42 Table 1.4-3	
														Fluoranthene	3.00E-06	lb/MMscf	1.53E-07	6.70E-07	AP-42 Table 1.4-3	
														Fluorene	2.80E-06	lb/MMscf	1.43E-07	6.25E-07	AP-42 Table 1.4-3	
														Formaldehyde	7.50E-02	lb/MMscf	3.82E-03	1.67E-02	AP-42 Table 1.4-3	
														Indeno(1,2,3-c,d)pyrene	1.80E-06	lb/MMscf	9.18E-08	4.02E-07	AP-42 Table 1.4-3	
														n-Hexane	1.80E+00	lb/MMscf	9.18E-02	4.02E-01	AP-42 Table 1.4-3	
														Naphthalene	6.10E-04	lb/MMscf	3.11E-05	1.36E-04	AP-42 Table 1.4-3	
														Phenanthrene	1.70E-05	lb/MMscf	8.67E-07	3.80E-06	AP-42 Table 1.4-3	
														Pyrene	5.00E-06	lb/MMscf	2.55E-07	1.12E-06	AP-42 Table 1.4-3	
														Toluene	3.40E-03	lb/MMscf	1.73E-04	7.59E-04	AP-42 Table 1.4-3	
														Arsenic	2.00E-04	lb/MMscf	1.02E-05	4.47E-05	AP-42 Table 1.4-4	
														Beryllium	1.20E-05	lb/MMscf	6.12E-07	2.68E-06	AP-42 Table 1.4-4	
														Cadmium	1.10E-03	lb/MMscf	5.61E-05	2.46E-04	AP-42 Table 1.4-4	
														Chromium	1.40E-03	lb/MMscf	7.14E-05	3.13E-04	AP-42 Table 1.4-4	
														Cobalt	8.40E-05	lb/MMscf	4.28E-06	1.88E-05	AP-42 Table 1.4-4	
														Lead	5.00E-04	lb/MMscf	2.55E-05	1.12E-04	AP-42 Table 1.4-2	
														Manganese	3.80E-04	lb/MMscf	1.94E-05	8.49E-05	AP-42 Table 1.4-4	
														Mercury	2.60E-04	lb/MMscf	1.33E-05	5.81E-05	AP-42 Table 1.4-4	
														Nickel	2.10E-03	lb/MMscf	1.07E-04	4.69E-04	AP-42 Table 1.4-4	
														Selenium	2.40E-05	lb/MMscf	1.22E-06	5.36E-06	AP-42 Table 1.4-4	

HAZARDOUS AIR POLLUTANTS (HAPS) DETAILED CALCULATIONS, PER ENGINE

Area	Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Power Output		Controls		Emissions					References	Number of Units
			Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Amount	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lb/hr)	Yearly Rate (tons/yr)		
System No. & Name:			System 3: Black Start Engine Generators for Prime Power Engines																	
Prime Power Yard	BSE1 - BSE4	Volvo Penta T4 1,370 kW Diesel Fueled Black Start Engine Generators	1	100	14.15	1415.0	103.0	10,300	Gallons	1864	BHP	OnCat SCR Particulate Filter	N/A	Benzene	7.76E-04	lb/MMBtu	1.10E-02	5.49E-04	AP-42 Table 3.4-3	4
														Toluene	2.81E-04	lb/MMBtu	3.98E-03	1.99E-04	AP-42 Table 3.4-3	
														Xylenes	1.93E-04	lb/MMBtu	2.73E-03	1.37E-04	AP-42 Table 3.4-3	
														Formaldehyde	7.89E-05	lb/MMBtu	1.12E-03	5.58E-05	AP-42 Table 3.4-3	
														Acetaldehyde	2.52E-05	lb/MMBtu	3.57E-04	1.78E-05	AP-42 Table 3.4-3	
														Acrolein	7.88E-06	lb/MMBtu	1.12E-04	5.58E-06	AP-42 Table 3.4-3	
														Naphthalene	1.30E-04	lb/MMBtu	1.84E-03	9.20E-05	AP-42 Table 3.4-4	
														Total PAH	2.12E-04	lb/MMBtu	3.00E-03	1.50E-04	AP-42 Table 3.4-4	
System No. & Name:			System 4: Generator Building A Engines																	
DC Generator Building A	DC1A_01 - DC1A_24	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204.3	20,430	Gallons	4,393	BHP	OnCat SCR Particulate Filter	N/A	Benzene	7.76E-04	lb/MMBtu	2.18E-02	1.09E-03	AP-42 Table 3.4-3	24
														Toluene	2.81E-04	lb/MMBtu	7.89E-03	3.94E-04	AP-42 Table 3.4-3	
														Xylenes	1.93E-04	lb/MMBtu	5.42E-03	2.71E-04	AP-42 Table 3.4-3	
														Formaldehyde	7.89E-05	lb/MMBtu	2.21E-03	1.11E-04	AP-42 Table 3.4-3	
														Acetaldehyde	2.52E-05	lb/MMBtu	7.07E-04	3.54E-05	AP-42 Table 3.4-3	
														Acrolein	7.88E-06	lb/MMBtu	2.21E-04	1.11E-05	AP-42 Table 3.4-3	
														Naphthalene	1.30E-04	lb/MMBtu	3.65E-03	1.82E-04	AP-42 Table 3.4-4	
														Total PAH	2.12E-04	lb/MMBtu	5.95E-03	2.98E-04	AP-42 Table 3.4-4	
System No. & Name:			System 4: Generator Building B Engines																	
DC Generator Building B	DC1B_01 - DC1B_29	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204.3	20,430	Gallons	4,393	BHP	OnCat SCR Particulate Filter	N/A	Benzene	7.76E-04	lb/MMBtu	2.18E-02	1.09E-03	AP-42 Table 3.4-3	29
														Toluene	2.81E-04	lb/MMBtu	7.89E-03	3.94E-04	AP-42 Table 3.4-3	
														Xylenes	1.93E-04	lb/MMBtu	5.42E-03	2.71E-04	AP-42 Table 3.4-3	
														Formaldehyde	7.89E-05	lb/MMBtu	2.21E-03	1.11E-04	AP-42 Table 3.4-3	
														Acetaldehyde	2.52E-05	lb/MMBtu	7.07E-04	3.54E-05	AP-42 Table 3.4-3	
														Acrolein	7.88E-06	lb/MMBtu	2.21E-04	1.11E-05	AP-42 Table 3.4-3	
														Naphthalene	1.30E-04	lb/MMBtu	3.65E-03	1.82E-04	AP-42 Table 3.4-4	
														Total PAH	2.12E-04	lb/MMBtu	5.95E-03	2.98E-04	AP-42 Table 3.4-4	
System No. & Name:			System 4: Generator Building C Engines																	
DC Generator Building C	DC1C_01 - DC1C_24	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204.3	20,430	Gallons	4,393	BHP	OnCat SCR Particulate Filter	N/A	Benzene	7.76E-04	lb/MMBtu	2.18E-02	1.09E-03	AP-42 Table 3.4-3	24
														Toluene	2.81E-04	lb/MMBtu	7.89E-03	3.94E-04	AP-42 Table 3.4-3	
														Xylenes	1.93E-04	lb/MMBtu	5.42E-03	2.71E-04	AP-42 Table 3.4-3	
														Formaldehyde	7.89E-05	lb/MMBtu	2.21E-03	1.11E-04	AP-42 Table 3.4-3	
														Acetaldehyde	2.52E-05	lb/MMBtu	7.07E-04	3.54E-05	AP-42 Table 3.4-3	
														Acrolein	7.88E-06	lb/MMBtu	2.21E-04	1.11E-05	AP-42 Table 3.4-3	
														Naphthalene	1.30E-04	lb/MMBtu	3.65E-03	1.82E-04	AP-42 Table 3.4-4	
														Total PAH	2.12E-04	lb/MMBtu	5.95E-03	2.98E-04	AP-42 Table 3.4-4	

HAZARDOUS AIR POLLUTANTS (HAPS) DETAILED CALCULATIONS, PER ENGINE

Area	Unit No.	Unit Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage		Power Output		Controls		Emissions					References	Number of Units	
			Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Amount	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lb/hr)			Yearly Rate (tons/yr)
System No. & Name:			System 4: Generator Building D Engines																	
DC Generator Building D	DC1D_01 - DC1D_29	Tier 4 Caterpillar 3516E 3.0 MW Diesel-Fired Generator	1	100	28.1	2,807	204	20,430	Gallons	4,393	BHP	OnCat SCR Particulate Filter	N/A	Benzene	7.76E-04	lb/MMBtu	2.18E-02	1.09E-03	AP-42 Table 3.4-3	29
														Toluene	2.81E-04	lb/MMBtu	7.89E-03	3.94E-04	AP-42 Table 3.4-3	
														Xylenes	1.93E-04	lb/MMBtu	5.42E-03	2.71E-04	AP-42 Table 3.4-3	
														Formaldehyde	7.89E-05	lb/MMBtu	2.21E-03	1.11E-04	AP-42 Table 3.4-3	
														Acetaldehyde	2.52E-05	lb/MMBtu	7.07E-04	3.54E-05	AP-42 Table 3.4-3	
														Acrolein	7.88E-06	lb/MMBtu	2.21E-04	1.11E-05	AP-42 Table 3.4-3	
														Naphthalene	1.30E-04	lb/MMBtu	3.65E-03	1.82E-04	AP-42 Table 3.4-4	
System No. & Name:			System 5: Substation Engines																	
Substation	C32_1 - C32_2	Tier 2 Caterpillar C32 1.25 MW Diesel-Fired Generator	1	100	12.0	1197.4	87.4	8,740	Gallons	1,676	BHP	None	N/A	Benzene	7.76E-04	lb/MMBtu	9.29E-03	4.65E-04	AP-42 Table 3.4-3	2
														Toluene	2.81E-04	lb/MMBtu	3.36E-03	1.68E-04	AP-42 Table 3.4-3	
														Xylenes	1.93E-04	lb/MMBtu	2.31E-03	1.16E-04	AP-42 Table 3.4-3	
														Formaldehyde	7.89E-05	lb/MMBtu	9.45E-04	4.72E-05	AP-42 Table 3.4-3	
														Acetaldehyde	2.52E-05	lb/MMBtu	3.02E-04	1.51E-05	AP-42 Table 3.4-3	
														Acrolein	7.88E-06	lb/MMBtu	9.44E-05	4.72E-06	AP-42 Table 3.4-3	
														Naphthalene	1.30E-04	lb/MMBtu	1.56E-03	7.78E-05	AP-42 Table 3.4-4	
System No. & Name:			System 6: Fire Pump Engines																	
Fire Command Center	FIRE_1 - FIRE_2	Tier 3 UFAD12 364 kW Clark Diesel-Fired Fire Pump Engine	1	40	4.32	173	31.5	1260	Gallons	488	BHP	None	N/A	Benzene	9.33E-04	lb/MMBtu	3.19E-03	6.37E-05	AP-42 Table 3.3-2	2
														Toluene	4.09E-04	lb/MMBtu	1.40E-03	2.79E-05	AP-42 Table 3.3-2	
														Xylenes	2.85E-04	lb/MMBtu	9.74E-04	1.95E-05	AP-42 Table 3.3-2	
														Formaldehyde	1.18E-03	lb/MMBtu	4.03E-03	8.06E-05	AP-42 Table 3.3-2	
														Acetaldehyde	7.67E-04	lb/MMBtu	2.62E-03	5.24E-05	AP-42 Table 3.3-2	
														Acrolein	9.25E-05	lb/MMBtu	3.16E-04	6.32E-06	AP-42 Table 3.3-2	
														Naphthalene	8.48E-05	lb/MMBtu	2.90E-04	5.79E-06	AP-42 Table 3.3-2	
Total PAH															1.68E-04	lb/MMBtu	5.74E-04	1.15E-05	AP-42 Table 3.3-2	
1,3-Butadiene															3.91E-05	lb/MMBtu	1.34E-04	2.67E-06	AP-42 Table 3.3-2	

FACILITY-WIDE POTENTIAL TO EMIT TABLE
(FOR ALL SOURCES INCLUDING INSIGNIFICANT ACTIVITIES)
(POUND/HOUR AND TON/YEAR)

Pollutant	Facility-Wide Potential to Emit (pound/hour)	Facility-Wide Potential to Emit (ton/year)
Total Particulate Matter (PM)	26.2	23.1
Total PM ₁₀	26.2	23.1
Total PM _{2.5}	26.2	23.1
Total Sulfur Dioxide (SO ₂)	13.1	28.5
Total Carbon Monoxide (CO)	167	121
Total Oxides of Nitrogen (NO _x)	428	130
Total Volatile Organic Compounds (VOC)	71.8	43.0
Total Lead (Pb)	--	--
Total Hydrogen Sulfide (H ₂ S)	--	--
Total Sulfuric Acid Mist (H ₂ SO ₄)	--	--
Total Hazardous Air Pollutants (HAPs)	20.6	45.0
Total Greenhouse Gases (CO ₂ e)	648,281	643,087

PLANT BOUNDARY COORDINATES FORM

Corner Number	UTM Easting	UTM Northing
1	294469.73	4371480.20
2	294388.90	4371537.94
3	294319.61	4371572.59
4	294246.47	4371603.38
5	293796.09	4372003.72
6	292964.63	4372022.97
7	292945.38	4371622.63
8	292144.71	4371657.28
9	292129.31	4370856.60
10	291736.36	4370858.24
11	291674.34	4369694.74
12	292075.20	4369678.58
13	292059.56	4369289.70
14	291669.55	4369287.67
15	291637.19	4368484.41
16	292749.18	4368466.22

PLANT BUILDING PARAMETERS FORM

Building Parameters

Building Name: Power Building A
Roof Height (ft): 36

Building Tier: 1
Building Diameter (ft): N/A
Y-Length (ft): 25

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293235.52	4371430.55	293385.92	4371573.87
293369.73	4371589.09	293251.49	4371414.69

Building Parameters

Building Name: Power Building B
Roof Height (ft): 36

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293434.58	4371666.72	293603.91	4371833.86
293588.34	4371849.18	293450.38	4371651.76

Building Parameters

Building Name: Power Building C
Roof Height (ft): 36

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293313.48	4371352.41	293463.29	4371495.66
293447.22	4371510.61	293329.43	4371336.67

Building Parameters

Building Name: Power Building D
Roof Height (ft): 36

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293512.45	4371589.06	293681.76	4371755.70
293665.82	4371771.63	293528.24	4371572.94

PLANT BUILDING PARAMETERS FORM

Building Parameters

Building Name: J420 Gen Housing Building 1
Roof Height (ft): 18

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293604.89	4371619.36	293657.23	4371667.59
293650.45	4371673.62	293611.27	4371613.03

Building Parameters

Building Name: J420 Gen Housing Building 2
Roof Height (ft): 18

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293616.24	4371609.72	293670.16	4371659.16
293663.19	4371665.71	293623.10	4371603.25

Building Parameters

Building Name: J420 Gen Housing Building 3
Roof Height (ft): 18

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293632.36	4371592.02	293686.40	4371641.66
293679.55	4371647.79	293639.25	4371585.54

Building Parameters

Building Name: J420 Gen Housing Building 4
Roof Height (ft): 18

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293697.50	4371631.77	293667.93	4371610.84
293674.86	4371604.20	293690.86	4371638.26

Building Parameters

Building Name: J420 Gen Housing Building 5
Roof Height (ft): 18

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293665.37	4371691.73	293719.37	4371741.14
293712.84	4371747.68	293671.80	4371685.69

PLANT BUILDING PARAMETERS FORM

Building Parameters

Building Name: J420 Gen Housing Building 6
Roof Height (ft): 18

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293678.01	4371683.57	293730.65	4371731.49
293723.89	4371737.98	293685.43	4371676.97

Building Parameters

Building Name: J420 Gen Housing Building 7
Roof Height (ft): 18

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293692.97	4371663.83	293746.93	4371713.60
293740.25	4371720.15	293699.65	4371657.07

Building Parameters

Building Name: J420 Gen Housing Building 8
Roof Height (ft): 18

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293704.29	4371653.88	293758.29	4371703.65
293751.60	4371710.28	293710.78	4371647.67

Building Parameters

Building Name: Water Building
Roof Height (ft): 35.5
X-Length (ft): 122
Rotation Angle (deg): 316.6

Building Tier: 1
Building Diameter (ft): N/A
Y-Length (ft): 153.3

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293367.34	4371687.51		

Building Parameters

Building Name: Data Center Building
Roof Height (ft): 60

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293264.47	4371401.50	293652.80	4371787.60
293617.73	4371821.71	293299.12	4371367.02

PLANT BUILDING PARAMETERS FORM

Building Parameters

Building Name:	CAT C32 Generator 1 Housing	Building Tier:	1
Roof Height (ft):	12.3	Building Diameter (ft):	N/A
X-Length (ft):	11	Y-Length (ft):	25
Rotation Angle (deg):	46		

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293457.50	4371391.91		

Building Parameters

Building Name:	CAT C32 Generator 2 Housing	Building Tier:	1
Roof Height (ft):	12.3	Building Diameter (ft):	N/A
X-Length (ft):	11	Y-Length (ft):	25
Rotation Angle (deg):	46		

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293461.38	4371396.66		

Building Parameters

Building Name:	Black Start Generator 1 Housing	Building Tier:	1
Roof Height (ft):	12.3	Building Diameter (ft):	N/A
X-Length (ft):	11.58	Y-Length (ft):	34.12
Rotation Angle (deg):	46		

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293664.72	4371680.19		

Building Parameters

Building Name:	Black Start Generator 2 Housing	Building Tier:	1
Roof Height (ft):	12.3	Building Diameter (ft):	N/A
X-Length (ft):	11.58	Y-Length (ft):	34.12
Rotation Angle (deg):	46		

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293675.53	4371661.55		

PLANT BUILDING PARAMETERS FORM

Building Parameters

Building Name:	Black Start Generator 3 Housing	Building Tier:	1
Roof Height (ft):	12.3	Building Diameter (ft):	N/A
X-Length (ft):	11.58	Y-Length (ft):	34.12
Rotation Angle (deg):	46		

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293692.28	4371652.43		

Building Parameters

Building Name:	Black Start Generator 4 Housing	Building Tier:	1
Roof Height (ft):	12.3	Building Diameter (ft):	N/A
X-Length (ft):	11.58	Y-Length (ft):	34.12
Rotation Angle (deg):	46		

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293703.01	4371633.87		

Building Parameters

Building Name:	Vaporizer 1 Housing	Building Tier:	1
Roof Height (ft):	13.48	Building Diameter (ft):	N/A
X-Length (ft):	9.81	Y-Length (ft):	52
Rotation Angle (deg):	47.59		

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293731.07	4371778.86		

Building Parameters

Building Name:	Vaporizer 2 Housing	Building Tier:	1
Roof Height (ft):	13.48	Building Diameter (ft):	N/A
X-Length (ft):	9.81	Y-Length (ft):	52
Rotation Angle (deg):	47.59		

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293728.21	4371775.89		

PLANT BUILDING PARAMETERS FORM

Building Parameters

Building Name: Fire Response Center Building

Building Tier: 1

Roof Height (ft): 18

Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293511.17	4371447.07	293515.91	4371473.26
293503.60	4371454.64	293521.37	4371479.56
293517.99	4371471.64	293530.93	4371470.12

Building Parameters

Building Name: Water Tank 1

Building Tier: 1

Roof Height (ft): 35

Building Diameter (ft): 43

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293364.02	4371656.12		

Building Parameters

Building Name: Water Tank 2

Building Tier: 1

Roof Height (ft): 35

Building Diameter (ft): 43

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293374.10	4371667.15		

Building Parameters

Building Name: Water Tank 3

Building Tier: 1

Roof Height (ft): 35

Building Diameter (ft): 27

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293377.70	4371650.02		

Building Parameters

Building Name: Water Tank 4

Building Tier: 1

Roof Height (ft): 35

Building Diameter (ft): 27

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
293385.69	4371659.57		

APPLICATION CERTIFICATION DOCUMENT (With Required Attachments)

Please check all applicable boxes below to indicate the information provided in your application submittal:

- ☒ Cover Page
- ☒ General Company Information Form
- ☐ Compliance Plan
- ☐ Industrial Process Application Form(s)
- ☒ Combustion Equipment Application Form(s)
- ☐ Storage Silo Application Form(s)
- ☒ Liquid Storage Tank Application Form(s)
- ☒ Manufacturer's Guarantee
- ☒ Facility-Wide Potential to Emit Table
- ☐ Revision Table
- ☒ **Surface Area Disturbance Form** – Submitting separately
- ☒ Plant Boundary Coordinates Form
- ☒ Plant Building Parameters Form
- ☒ Detailed Emission Calculations (for all emission units including IA units)
- ☐ Source Testing Data (if referenced in calculations)
- ☒ Process Narrative (revision applications must include a description of the revision)
- ☐ Process Flow Diagram(s)
- ☒ Site Plan(s) showing the locations (UTM coordinates), dimensions, and heights of buildings on the site
- ☒ Maps:
 - ☒ Vicinity Map of where the facility is located in the State
 - ☒ Area Map of the Facility (including location of all emission units, building locations (with UTM's), location of front gate, and fence line/site boundary (with UTM's))
- ☒ Environmental Evaluation (AERMOD Air Dispersion Modeling Report and Electronic Input Files) (NAC 445B.310, NAC 445B.311)
- ☒ Manufacturer's Guarantee *if applicable*
- ☒ Equipment Specifications *if applicable*
- ☒ TANKs Modeling Output *if applicable*
- ☒ Application Fee Attached or Electronically Submitted
- ☒ Digital Copy of Application on CD or Thumb Drive
- ☒ Application Certification Document with Original Responsible Official Signature

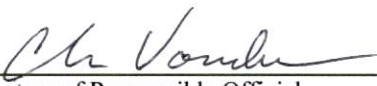
APPLICATION CERTIFICATION DOCUMENT (CONTINUED)
(With Required Attachments)

PLEASE NOTE THE FOLLOWING REQUIREMENTS WHICH APPLY TO PERMIT APPLICANTS DURING THE APPLICATION PROCESS:

- A. A permit applicant must submit supplementary facts or corrected information upon discovery. (NAC 445B.297(1)(b))
- B. A permit applicant is required to provide any additional information which the Director requests in writing within the time specified in the Director's request. (NAC 445B.297(1)(c))
- C. Submission of fraudulent data or other information may result in prosecution for an alleged criminal offense. (NRS 445B.470)

CERTIFICATION:

I certify that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate and complete.



Signature of Responsible Official

Chris Vonderhaar - President, Fleet

Print or Type Name and Title

2/27/26

Date

System 1 P1 Power Plant Engines (90)

BAPC ID	ID	Building	Equipment	UTM E (m)	UTM N (m)
S1.001	J420_01	Prime Engine Yard (Outdoors)	P1 Engine	293608.11	4371617.17
S1.002	J420_02	Prime Engine Yard (Outdoors)	P1 Engine	293612.63	4371622.63
S1.003	J420_03	Prime Engine Yard (Outdoors)	P1 Engine	293616.14	4371626.74
S1.004	J420_04	Prime Engine Yard (Outdoors)	P1 Engine	293620.83	4371632.19
S1.005	J420_05	Prime Engine Yard (Outdoors)	P1 Engine	293624.18	4371636.40
S1.006	J420_06	Prime Engine Yard (Outdoors)	P1 Engine	293628.58	4371641.67
S1.007	J420_07	Prime Engine Yard (Outdoors)	P1 Engine	293632.05	4371645.97
S1.008	J420_08	Prime Engine Yard (Outdoors)	P1 Engine	293636.77	4371651.52
S1.009	J420_09	Prime Engine Yard (Outdoors)	P1 Engine	293640.31	4371655.72
S1.010	J420_10	Prime Engine Yard (Outdoors)	P1 Engine	293644.78	4371661.11
S1.011	J420_11	Prime Engine Yard (Outdoors)	P1 Engine	293648.48	4371665.22
S1.012	J420_12	Prime Engine Yard (Outdoors)	P1 Engine	293652.77	4371670.41
S1.013	J420_13	Prime Engine Yard (Outdoors)	P1 Engine	293668.96	4371689.35
S1.014	J420_14	Prime Engine Yard (Outdoors)	P1 Engine	293673.28	4371694.60
S1.015	J420_15	Prime Engine Yard (Outdoors)	P1 Engine	293676.79	4371698.82
S1.016	J420_16	Prime Engine Yard (Outdoors)	P1 Engine	293681.18	4371704.27
S1.017	J420_17	Prime Engine Yard (Outdoors)	P1 Engine	293684.72	4371708.47
S1.018	J420_18	Prime Engine Yard (Outdoors)	P1 Engine	293689.43	4371713.64
S1.019	J420_19	Prime Engine Yard (Outdoors)	P1 Engine	293693.00	4371718.14
S1.020	J420_20	Prime Engine Yard (Outdoors)	P1 Engine	293697.42	4371723.38
S1.021	J420_21	Prime Engine Yard (Outdoors)	P1 Engine	293701.26	4371727.49
S1.022	J420_22	Prime Engine Yard (Outdoors)	P1 Engine	293705.45	4371732.94
S1.023	J420_23	Prime Engine Yard (Outdoors)	P1 Engine	293709.05	4371737.36
S1.024	J420_24	Prime Engine Yard (Outdoors)	P1 Engine	293713.54	4371742.85
S1.025	J420_25	Prime Engine Yard (Outdoors)	P1 Engine	293621.93	4371608.42
S1.026	J420_26	Prime Engine Yard (Outdoors)	P1 Engine	293626.45	4371613.87
S1.027	J420_27	Prime Engine Yard (Outdoors)	P1 Engine	293630.01	4371618.20
S1.028	J420_28	Prime Engine Yard (Outdoors)	P1 Engine	293634.49	4371623.65
S1.029	J420_29	Prime Engine Yard (Outdoors)	P1 Engine	293638.01	4371627.42
S1.030	J420_30	Prime Engine Yard (Outdoors)	P1 Engine	293642.62	4371632.89
S1.031	J420_31	Prime Engine Yard (Outdoors)	P1 Engine	293646.09	4371637.19
S1.032	J420_32	Prime Engine Yard (Outdoors)	P1 Engine	293650.61	4371642.54
S1.033	J420_33	Prime Engine Yard (Outdoors)	P1 Engine	293654.15	4371646.75
S1.034	J420_34	Prime Engine Yard (Outdoors)	P1 Engine	293658.59	4371652.14
S1.035	J420_35	Prime Engine Yard (Outdoors)	P1 Engine	293662.18	4371656.35
S1.036	J420_36	Prime Engine Yard (Outdoors)	P1 Engine	293666.78	4371661.74
S1.037	J420_37	Prime Engine Yard (Outdoors)	P1 Engine	293682.23	4371680.57
S1.038	J420_38	Prime Engine Yard (Outdoors)	P1 Engine	293686.95	4371685.72
S1.039	J420_39	Prime Engine Yard (Outdoors)	P1 Engine	293690.57	4371690.14
S1.040	J420_40	Prime Engine Yard (Outdoors)	P1 Engine	293695.06	4371695.59
S1.041	J420_41	Prime Engine Yard (Outdoors)	P1 Engine	293698.50	4371699.69
S1.042	J420_42	Prime Engine Yard (Outdoors)	P1 Engine	293703.11	4371705.16
S1.043	J420_43	Prime Engine Yard (Outdoors)	P1 Engine	293706.68	4371709.16
S1.044	J420_44	Prime Engine Yard (Outdoors)	P1 Engine	293711.30	4371714.71
S1.045	J420_45	Prime Engine Yard (Outdoors)	P1 Engine	293714.73	4371718.91
S1.046	J420_46	Prime Engine Yard (Outdoors)	P1 Engine	293719.34	4371724.37
S1.047	J420_47	Prime Engine Yard (Outdoors)	P1 Engine	293722.93	4371728.48
S1.048	J420_48	Prime Engine Yard (Outdoors)	P1 Engine	293727.22	4371733.87
S1.049	J420_49	Prime Engine Yard (Outdoors)	P1 Engine	293635.85	4371589.49
S1.050	J420_50	Prime Engine Yard (Outdoors)	P1 Engine	293640.37	4371594.84
S1.051	J420_51	Prime Engine Yard (Outdoors)	P1 Engine	293643.88	4371598.85
S1.052	J420_52	Prime Engine Yard (Outdoors)	P1 Engine	293648.48	4371604.31
S1.053	J420_53	Prime Engine Yard (Outdoors)	P1 Engine	293651.93	4371608.72
S1.054	J420_54	Prime Engine Yard (Outdoors)	P1 Engine	293656.54	4371613.99
S1.055	J420_55	Prime Engine Yard (Outdoors)	P1 Engine	293660.11	4371618.08
S1.056	J420_56	Prime Engine Yard (Outdoors)	P1 Engine	293664.59	4371623.70
S1.057	J420_57	Prime Engine Yard (Outdoors)	P1 Engine	293668.02	4371627.60
S1.058	J420_58	Prime Engine Yard (Outdoors)	P1 Engine	293673.03	4371633.06
S1.059	J420_59	Prime Engine Yard (Outdoors)	P1 Engine	293676.12	4371637.57
S1.060	J420_60	Prime Engine Yard (Outdoors)	P1 Engine	293680.41	4371642.76
S1.061	J420_61	Prime Engine Yard (Outdoors)	P1 Engine	293696.41	4371661.57
S1.062	J420_62	Prime Engine Yard (Outdoors)	P1 Engine	293700.62	4371666.83
S1.063	J420_63	Prime Engine Yard (Outdoors)	P1 Engine	293704.44	4371671.04

System 1 P1 Power Plant Engines (90)

S1.064	J420_64	Prime Engine Yard (Outdoors)	P1 Engine	293708.93	4371676.29
S1.065	J420_65	Prime Engine Yard (Outdoors)	P1 Engine	293712.68	4371680.70
S1.066	J420_66	Prime Engine Yard (Outdoors)	P1 Engine	293717.29	4371686.07
S1.067	J420_67	Prime Engine Yard (Outdoors)	P1 Engine	293720.66	4371690.06
S1.068	J420_68	Prime Engine Yard (Outdoors)	P1 Engine	293724.97	4371695.51
S1.069	J420_69	Prime Engine Yard (Outdoors)	P1 Engine	293728.51	4371700.02
S1.070	J420_70	Prime Engine Yard (Outdoors)	P1 Engine	293733.11	4371705.37
S1.071	J420_71	Prime Engine Yard (Outdoors)	P1 Engine	293736.40	4371709.68
S1.072	J420_72	Prime Engine Yard (Outdoors)	P1 Engine	293740.99	4371715.08
S1.073	J420_73	Prime Engine Yard (Outdoors)	P1 Engine	293673.70	4371609.65
S1.074	J420_74	Prime Engine Yard (Outdoors)	P1 Engine	293678.17	4371615.13
S1.075	J420_75	Prime Engine Yard (Outdoors)	P1 Engine	293681.83	4371619.07
S1.076	J420_76	Prime Engine Yard (Outdoors)	P1 Engine	293686.31	4371624.64
S1.077	J420_77	Prime Engine Yard (Outdoors)	P1 Engine	293689.88	4371628.72
S1.078	J420_78	Prime Engine Yard (Outdoors)	P1 Engine	293694.35	4371634.14
S1.079	J420_79	Prime Engine Yard (Outdoors)	P1 Engine	293709.88	4371653.01
S1.080	J420_80	Prime Engine Yard (Outdoors)	P1 Engine	293714.47	4371658.59
S1.081	J420_81	Prime Engine Yard (Outdoors)	P1 Engine	293717.91	4371662.58
S1.082	J420_82	Prime Engine Yard (Outdoors)	P1 Engine	293722.52	4371668.08
S1.083	J420_83	Prime Engine Yard (Outdoors)	P1 Engine	293726.25	4371671.90
S1.084	J420_84	Prime Engine Yard (Outdoors)	P1 Engine	293730.71	4371677.52
S1.085	J420_85	Prime Engine Yard (Outdoors)	P1 Engine	293734.17	4371681.79
S1.086	J420_86	Prime Engine Yard (Outdoors)	P1 Engine	293738.63	4371687.35
S1.087	J420_87	Prime Engine Yard (Outdoors)	P1 Engine	293742.35	4371691.45
S1.088	J420_88	Prime Engine Yard (Outdoors)	P1 Engine	293746.77	4371697.02
S1.089	J420_89	Prime Engine Yard (Outdoors)	P1 Engine	293750.33	4371701.20
S1.090	J420_90	Prime Engine Yard (Outdoors)	P1 Engine	293754.77	4371706.38

System 2 LNG Vaporizers (2)

BAPC ID	ID	Building	Equipment	UTM E (m)	UTM N (m)
S2.001	VAP1	Prime Engine Yard (Outdoors)	LNG Vaporizer 1	293722.9668	4371782.318
S2.002	VAP2	Prime Engine Yard (Outdoors)	LNG Vaporizer 2	293726.3056	4371785.271

System 3 BSE Gensets (4)

BAPC ID	ID	Building	Equipment	UTM E (m)	UTM N (m)
S3.001	BSE1	Prime Engine Yard (Outdoors)	BS Engine	293664.18	4371683.01
S3.002	BSE2	Prime Engine Yard (Outdoors)	BS Engine	293670.87	4371668.47
S3.003	BSE3	Prime Engine Yard (Outdoors)	BS Engine	293691.89	4371655.47
S3.004	BSE4	Prime Engine Yard (Outdoors)	BS Engine	293698.06	4371641.11

System 4 Data Center Emergency Backup Engines (106)

BAPC ID	ID	Building	Equipment	UTM E (m)	UTM N (m)
S4.001	DC1A_01	Power Building A	DC Engine	293360.39	4371573.30
S4.002	DC1A_02	Power Building A	DC Engine	293358.16	4371570.64
S4.003	DC1A_03	Power Building A	DC Engine	293345.48	4371555.53
S4.004	DC1A_04	Power Building A	DC Engine	293343.25	4371552.87
S4.005	DC1A_05	Power Building A	DC Engine	293340.60	4371549.70
S4.006	DC1A_06	Power Building A	DC Engine	293338.37	4371547.04
S4.007	DC1A_07	Power Building A	DC Engine	293325.69	4371531.94
S4.008	DC1A_08	Power Building A	DC Engine	293323.46	4371529.28
S4.009	DC1A_09	Power Building A	DC Engine	293320.80	4371526.12
S4.010	DC1A_10	Power Building A	DC Engine	293318.57	4371523.45
S4.011	DC1A_11	Power Building A	DC Engine	293305.89	4371508.34
S4.012	DC1A_12	Power Building A	DC Engine	293303.66	4371505.69
S4.013	DC1A_13	Power Building A	DC Engine	293300.13	4371501.47
S4.014	DC1A_14	Power Building A	DC Engine	293297.89	4371498.81
S4.015	DC1A_15	Power Building A	DC Engine	293285.22	4371483.70
S4.016	DC1A_16	Power Building A	DC Engine	293282.98	4371481.04
S4.017	DC1A_17	Power Building A	DC Engine	293280.33	4371477.87
S4.018	DC1A_18	Power Building A	DC Engine	293278.10	4371475.21
S4.019	DC1A_19	Power Building A	DC Engine	293265.42	4371460.11
S4.020	DC1A_20	Power Building A	DC Engine	293263.19	4371457.45
S4.021	DC1A_21	Power Building A	DC Engine	293260.54	4371454.28
S4.022	DC1A_22	Power Building A	DC Engine	293258.30	4371451.63
S4.023	DC1A_23	Power Building A	DC Engine	293245.62	4371436.52
S4.024	DC1A_24	Power Building A	DC Engine	293243.39	4371433.86
S4.025	DC1B_01	Power Building B	DC Engine	293585.34	4371841.86
S4.026	DC1B_02	Power Building B	DC Engine	293583.11	4371839.20
S4.027	DC1B_03	Power Building B	DC Engine	293570.43	4371824.09
S4.028	DC1B_04	Power Building B	DC Engine	293568.20	4371821.43
S4.029	DC1B_05	Power Building B	DC Engine	293565.54	4371818.27
S4.030	DC1B_06	Power Building B	DC Engine	293563.31	4371815.61
S4.031	DC1B_07	Power Building B	DC Engine	293550.64	4371800.50
S4.032	DC1B_08	Power Building B	DC Engine	293548.41	4371797.84
S4.033	DC1B_09	Power Building B	DC Engine	293545.75	4371794.67
S4.034	DC1B_10	Power Building B	DC Engine	293543.52	4371792.01
S4.035	DC1B_11	Power Building B	DC Engine	293530.85	4371776.91
S4.036	DC1B_12	Power Building B	DC Engine	293528.62	4371774.12
S4.037	DC1B_13	Power Building B	DC Engine	293525.96	4371770.96
S4.038	DC1B_14	Power Building B	DC Engine	293523.73	4371768.30
S4.039	DC1B_15	Power Building B	DC Engine	293511.06	4371753.19
S4.040	DC1B_16	Power Building B	DC Engine	293508.83	4371750.53
S4.041	DC1B_17	Power Building B	DC Engine	293505.29	4371746.32
S4.042	DC1B_18	Power Building B	DC Engine	293503.07	4371743.67
S4.043	DC1B_19	Power Building B	DC Engine	293490.39	4371728.56
S4.044	DC1B_20	Power Building B	DC Engine	293488.16	4371725.90
S4.045	DC1B_21	Power Building B	DC Engine	293485.50	4371722.73
S4.046	DC1B_22	Power Building B	DC Engine	293483.27	4371720.08
S4.047	DC1B_23	Power Building B	DC Engine	293470.60	4371704.97
S4.048	DC1B_24	Power Building B	DC Engine	293468.36	4371702.31
S4.049	DC1B_25	Power Building B	DC Engine	293465.71	4371699.13
S4.050	DC1B_26	Power Building B	DC Engine	293463.48	4371696.47
S4.051	DC1B_27	Power Building B	DC Engine	293450.80	4371681.36
S4.052	DC1B_28	Power Building B	DC Engine	293448.57	4371678.70
S4.053	DC1B_29	Power Building B	DC Engine	293441.50	4371670.27
S4.054	DC1C_01	Power Building C	DC Engine	293332.75	4371345.95
S4.055	DC1C_02	Power Building C	DC Engine	293335.02	4371348.57
S4.056	DC1C_03	Power Building C	DC Engine	293347.98	4371363.45
S4.057	DC1C_04	Power Building C	DC Engine	293350.28	4371366.05
S4.058	DC1C_05	Power Building C	DC Engine	293353.01	4371369.18
S4.059	DC1C_06	Power Building C	DC Engine	293355.24	4371371.80
S4.060	DC1C_07	Power Building C	DC Engine	293367.91	4371386.91
S4.061	DC1C_08	Power Building C	DC Engine	293370.16	4371389.58
S4.062	DC1C_09	Power Building C	DC Engine	293372.82	4371392.73
S4.063	DC1C_10	Power Building C	DC Engine	293375.04	4371395.39

System 4 Data Center Emergency Backup Engines (106)

S4.064	DC1C_11	Power Building C	DC Engine	293387.74	4371410.50
S4.065	DC1C_12	Power Building C	DC Engine	293389.98	4371413.15
S4.066	DC1C_13	Power Building C	DC Engine	293393.53	4371417.37
S4.067	DC1C_14	Power Building C	DC Engine	293395.77	4371420.03
S4.068	DC1C_15	Power Building C	DC Engine	293407.56	4371434.07
S4.069	DC1C_16	Power Building C	DC Engine	293409.80	4371436.72
S4.070	DC1C_17	Power Building C	DC Engine	293412.46	4371439.89
S4.071	DC1C_18	Power Building C	DC Engine	293414.69	4371442.55
S4.072	DC1C_19	Power Building C	DC Engine	293427.37	4371457.65
S4.073	DC1C_20	Power Building C	DC Engine	293429.60	4371460.31
S4.074	DC1C_21	Power Building C	DC Engine	293432.28	4371463.47
S4.075	DC1C_22	Power Building C	DC Engine	293434.51	4371466.13
S4.076	DC1C_23	Power Building C	DC Engine	293447.20	4371481.24
S4.077	DC1C_24	Power Building C	DC Engine	293449.43	4371483.89
S4.078	DC1D_01	Power Building D	DC Engine	293530.60	4371580.42
S4.079	DC1D_02	Power Building D	DC Engine	293537.67	4371588.84
S4.080	DC1D_03	Power Building D	DC Engine	293539.90	4371591.50
S4.081	DC1D_04	Power Building D	DC Engine	293552.58	4371606.61
S4.082	DC1D_05	Power Building D	DC Engine	293554.81	4371609.27
S4.083	DC1D_06	Power Building D	DC Engine	293557.47	4371612.43
S4.084	DC1D_07	Power Building D	DC Engine	293559.70	4371615.09
S4.085	DC1D_08	Power Building D	DC Engine	293572.38	4371630.20
S4.086	DC1D_09	Power Building D	DC Engine	293574.61	4371632.86
S4.087	DC1D_10	Power Building D	DC Engine	293577.26	4371636.02
S4.088	DC1D_11	Power Building D	DC Engine	293579.50	4371638.68
S4.089	DC1D_12	Power Building D	DC Engine	293592.17	4371653.78
S4.090	DC1D_13	Power Building D	DC Engine	293594.40	4371656.44
S4.091	DC1D_14	Power Building D	DC Engine	293597.94	4371660.66
S4.092	DC1D_15	Power Building D	DC Engine	293600.17	4371663.31
S4.093	DC1D_16	Power Building D	DC Engine	293612.84	4371678.42
S4.094	DC1D_17	Power Building D	DC Engine	293615.08	4371681.08
S4.095	DC1D_18	Power Building D	DC Engine	293617.73	4371684.24
S4.096	DC1D_19	Power Building D	DC Engine	293619.96	4371686.90
S4.097	DC1D_20	Power Building D	DC Engine	293632.64	4371702.01
S4.098	DC1D_21	Power Building D	DC Engine	293634.87	4371704.67
S4.099	DC1D_22	Power Building D	DC Engine	293637.52	4371707.83
S4.100	DC1D_23	Power Building D	DC Engine	293639.75	4371710.49
S4.101	DC1D_24	Power Building D	DC Engine	293652.43	4371725.59
S4.102	DC1D_25	Power Building D	DC Engine	293654.66	4371728.25
S4.103	DC1D_26	Power Building D	DC Engine	293657.31	4371731.42
S4.104	DC1D_27	Power Building D	DC Engine	293659.54	4371734.07
S4.105	DC1D_28	Power Building D	DC Engine	293672.22	4371749.18
S4.106	DC1D_29	Power Building D	DC Engine	293674.45	4371751.84

System 5 Substation Engines (2)

BAPC ID	ID	Building	Equipment	UTM E (m)	UTM N (m)
S5.001	C32_1	Substation	Substation Engine	293454.36	4371397.32
S5.002	C32_2	Substation	Substation Engine	293458.25	4371401.96

System 6 Fire Pump Engines (2)

BAPC ID	ID	Building	Equipment	UTM E (m)	UTM N (m)
S6.001	FIRE_1	Fire and Security Building	Fire Pump Engine	293526.95	4371470.94
S6.002	FIRE_2	Fire and Security Building	Fire Pump Engine	293523.60	4371474.42

150-gallon Tanks (108) – Insignificant Activity

BAPC ID	ID	Building	Equipment	UTM E (m)	UTM N (m)
IA1.001	DC1A_T_01	Power Building A	DC Engine Tank	293361.42	4371572.39
IA1.002	DC1A_T_02	Power Building A	DC Engine Tank	293359.18	4371569.72
IA1.003	DC1A_T_03	Power Building A	DC Engine Tank	293346.50	4371554.61
IA1.004	DC1A_T_04	Power Building A	DC Engine Tank	293344.27	4371551.95
IA1.005	DC1A_T_05	Power Building A	DC Engine Tank	293341.62	4371548.79
IA1.006	DC1A_T_06	Power Building A	DC Engine Tank	293339.39	4371546.13
IA1.007	DC1A_T_07	Power Building A	DC Engine Tank	293326.71	4371531.02
IA1.008	DC1A_T_08	Power Building A	DC Engine Tank	293324.48	4371528.37
IA1.009	DC1A_T_09	Power Building A	DC Engine Tank	293321.82	4371525.20
IA1.010	DC1A_T_10	Power Building A	DC Engine Tank	293319.59	4371522.54
IA1.011	DC1A_T_11	Power Building A	DC Engine Tank	293306.91	4371507.43
IA1.012	DC1A_T_12	Power Building A	DC Engine Tank	293304.68	4371504.77
IA1.013	DC1A_T_13	Power Building A	DC Engine Tank	293301.15	4371500.55
IA1.014	DC1A_T_14	Power Building A	DC Engine Tank	293298.92	4371497.90
IA1.015	DC1A_T_15	Power Building A	DC Engine Tank	293286.24	4371482.78
IA1.016	DC1A_T_16	Power Building A	DC Engine Tank	293284.00	4371480.13
IA1.017	DC1A_T_17	Power Building A	DC Engine Tank	293281.35	4371476.96
IA1.018	DC1A_T_18	Power Building A	DC Engine Tank	293279.12	4371474.30
IA1.019	DC1A_T_19	Power Building A	DC Engine Tank	293266.45	4371459.19
IA1.020	DC1A_T_20	Power Building A	DC Engine Tank	293264.22	4371456.53
IA1.021	DC1A_T_21	Power Building A	DC Engine Tank	293261.56	4371453.37
IA1.022	DC1A_T_22	Power Building A	DC Engine Tank	293259.32	4371450.71
IA1.023	DC1A_T_23	Power Building A	DC Engine Tank	293246.65	4371435.61
IA1.024	DC1A_T_24	Power Building A	DC Engine Tank	293244.41	4371432.94
IA1.025	DC1B_T_01	Power Building B	DC Engine Tank	293586.96	4371840.39
IA1.026	DC1B_T_02	Power Building B	DC Engine Tank	293584.73	4371837.73
IA1.027	DC1B_T_03	Power Building B	DC Engine Tank	293572.05	4371822.62
IA1.028	DC1B_T_04	Power Building B	DC Engine Tank	293569.82	4371819.97
IA1.029	DC1B_T_05	Power Building B	DC Engine Tank	293567.17	4371816.80
IA1.030	DC1B_T_06	Power Building B	DC Engine Tank	293564.94	4371814.14
IA1.031	DC1B_T_07	Power Building B	DC Engine Tank	293552.26	4371799.03
IA1.032	DC1B_T_08	Power Building B	DC Engine Tank	293550.03	4371796.37
IA1.033	DC1B_T_09	Power Building B	DC Engine Tank	293547.37	4371793.21
IA1.034	DC1B_T_10	Power Building B	DC Engine Tank	293545.14	4371790.55
IA1.035	DC1B_T_11	Power Building B	DC Engine Tank	293532.47	4371775.44
IA1.036	DC1B_T_12	Power Building B	DC Engine Tank	293530.24	4371772.66
IA1.037	DC1B_T_13	Power Building B	DC Engine Tank	293527.59	4371769.49
IA1.038	DC1B_T_14	Power Building B	DC Engine Tank	293525.35	4371766.83
IA1.039	DC1B_T_15	Power Building B	DC Engine Tank	293512.68	4371751.73
IA1.040	DC1B_T_16	Power Building B	DC Engine Tank	293510.45	4371749.07
IA1.041	DC1B_T_17	Power Building B	DC Engine Tank	293506.92	4371744.86
IA1.042	DC1B_T_18	Power Building B	DC Engine Tank	293504.69	4371742.20
IA1.043	DC1B_T_19	Power Building B	DC Engine Tank	293492.01	4371727.09
IA1.044	DC1B_T_20	Power Building B	DC Engine Tank	293489.78	4371724.43
IA1.045	DC1B_T_21	Power Building B	DC Engine Tank	293487.12	4371721.27
IA1.046	DC1B_T_22	Power Building B	DC Engine Tank	293484.89	4371718.61
IA1.047	DC1B_T_23	Power Building B	DC Engine Tank	293472.22	4371703.50
IA1.048	DC1B_T_24	Power Building B	DC Engine Tank	293469.99	4371700.84
IA1.049	DC1B_T_25	Power Building B	DC Engine Tank	293467.33	4371697.67
IA1.050	DC1B_T_26	Power Building B	DC Engine Tank	293465.10	4371695.01
IA1.051	DC1B_T_27	Power Building B	DC Engine Tank	293452.43	4371679.90
IA1.052	DC1B_T_28	Power Building B	DC Engine Tank	293450.20	4371677.23
IA1.053	DC1B_T_29	Power Building B	DC Engine Tank	293443.09	4371668.78
IA1.054	DC1C_T_01	Power Building C	DC Engine Tank	293331.58	4371347.06
IA1.055	DC1C_T_02	Power Building C	DC Engine Tank	293333.86	4371349.67
IA1.056	DC1C_T_03	Power Building C	DC Engine Tank	293346.81	4371364.56
IA1.057	DC1C_T_04	Power Building C	DC Engine Tank	293349.12	4371367.16
IA1.058	DC1C_T_05	Power Building C	DC Engine Tank	293351.84	4371370.29
IA1.059	DC1C_T_06	Power Building C	DC Engine Tank	293354.08	4371372.91
IA1.060	DC1C_T_07	Power Building C	DC Engine Tank	293366.74	4371388.02
IA1.061	DC1C_T_08	Power Building C	DC Engine Tank	293369.00	4371390.69
IA1.062	DC1C_T_09	Power Building C	DC Engine Tank	293371.65	4371393.84
IA1.063	DC1C_T_10	Power Building C	DC Engine Tank	293373.88	4371396.50

150-gallon Tanks (108) – Insignificant Activity

IA1.064	DC1C T 11	Power Building C	DC Engine Tank	293386.58	4371411.61
IA1.065	DC1C T 12	Power Building C	DC Engine Tank	293388.82	4371414.26
IA1.066	DC1C T 13	Power Building C	DC Engine Tank	293392.37	4371418.48
IA1.067	DC1C T 14	Power Building C	DC Engine Tank	293394.61	4371421.14
IA1.068	DC1C T 15	Power Building C	DC Engine Tank	293406.40	4371435.18
IA1.069	DC1C T 16	Power Building C	DC Engine Tank	293408.64	4371437.83
IA1.070	DC1C T 17	Power Building C	DC Engine Tank	293411.29	4371441.00
IA1.071	DC1C T 18	Power Building C	DC Engine Tank	293413.53	4371443.66
IA1.072	DC1C T 19	Power Building C	DC Engine Tank	293426.20	4371458.76
IA1.073	DC1C T 20	Power Building C	DC Engine Tank	293428.44	4371461.42
IA1.074	DC1C T 21	Power Building C	DC Engine Tank	293431.12	4371464.58
IA1.075	DC1C T 22	Power Building C	DC Engine Tank	293433.35	4371467.24
IA1.076	DC1C T 23	Power Building C	DC Engine Tank	293446.03	4371482.35
IA1.077	DC1C T 24	Power Building C	DC Engine Tank	293448.27	4371485.00
IA1.078	DC1D T 01	Power Building D	DC Engine Tank	293528.92	4371582.07
IA1.079	DC1D T 02	Power Building D	DC Engine Tank	293535.99	4371590.50
IA1.080	DC1D T 03	Power Building D	DC Engine Tank	293538.22	4371593.16
IA1.081	DC1D T 04	Power Building D	DC Engine Tank	293550.90	4371608.26
IA1.082	DC1D T 05	Power Building D	DC Engine Tank	293553.13	4371610.92
IA1.083	DC1D T 06	Power Building D	DC Engine Tank	293555.79	4371614.09
IA1.084	DC1D T 07	Power Building D	DC Engine Tank	293558.02	4371616.74
IA1.085	DC1D T 08	Power Building D	DC Engine Tank	293570.70	4371631.85
IA1.086	DC1D T 09	Power Building D	DC Engine Tank	293572.93	4371634.51
IA1.087	DC1D T 10	Power Building D	DC Engine Tank	293575.58	4371637.67
IA1.088	DC1D T 11	Power Building D	DC Engine Tank	293577.81	4371640.33
IA1.089	DC1D T 12	Power Building D	DC Engine Tank	293590.49	4371655.44
IA1.090	DC1D T 13	Power Building D	DC Engine Tank	293592.72	4371658.10
IA1.091	DC1D T 14	Power Building D	DC Engine Tank	293596.26	4371662.31
IA1.092	DC1D T 15	Power Building D	DC Engine Tank	293598.49	4371664.97
IA1.093	DC1D T 16	Power Building D	DC Engine Tank	293611.16	4371680.08
IA1.094	DC1D T 17	Power Building D	DC Engine Tank	293613.39	4371682.73
IA1.095	DC1D T 18	Power Building D	DC Engine Tank	293616.05	4371685.90
IA1.096	DC1D T 19	Power Building D	DC Engine Tank	293618.28	4371688.56
IA1.097	DC1D T 20	Power Building D	DC Engine Tank	293630.96	4371703.66
IA1.098	DC1D T 21	Power Building D	DC Engine Tank	293633.19	4371706.32
IA1.099	DC1D T 22	Power Building D	DC Engine Tank	293635.84	4371709.48
IA1.100	DC1D T 23	Power Building D	DC Engine Tank	293638.07	4371712.14
IA1.101	DC1D T 24	Power Building D	DC Engine Tank	293650.75	4371727.25
IA1.102	DC1D T 25	Power Building D	DC Engine Tank	293652.98	4371729.91
IA1.103	DC1D T 26	Power Building D	DC Engine Tank	293655.63	4371733.07
IA1.104	DC1D T 27	Power Building D	DC Engine Tank	293657.86	4371735.73
IA1.105	DC1D T 28	Power Building D	DC Engine Tank	293670.54	4371750.83
IA1.106	DC1D T 29	Power Building D	DC Engine Tank	293672.77	4371753.49
IA1.107	C32 T 1	Substation	Substation Engine Tank	293457.24	4371394.61
IA1.108	C32 T 2	Substation	Substation Engine Tank	293461.14	4371399.25

1,240-gallon Tanks (4) - Insignificant Activity

BAPC ID	ID	Building	Equipment	UTM E (m)	UTM N (m)
IA2.001	BSE_T_1	Prime Engine Yard (Outdoors)	BSE Tank 1	293663.85	4371690.27
IA2.002	BSE_T_2	Prime Engine Yard (Outdoors)	BSE Tank 2	293677.49	4371668.74
IA2.003	BSE_T_3	Prime Engine Yard (Outdoors)	BSE Tank 3	293691.55	4371662.73
IA2.004	BSE_T_4	Prime Engine Yard (Outdoors)	BSE Tank 4	293705.20	4371641.21

400-gallon Tanks (2) – Insignificant Activity

BAPC ID	ID	Building	Equipment	UTM E (m)	UTM N (m)
IA3.001	FIRE_T_1	Fire and Security Building	Fire Pump Engine Tank	293525.50	4371468.94
IA3.002	FIRE_T_2	Fire and Security Building	Fire Pump Engine Tank	293522.15	4371472.42

ATTACHMENT B

PERMIT APPLICATION REPORT

**APPLICATION FOR CLASS I
OPERATING PERMIT TO CONSTRUCT
FOR THE SOUTH VALLEY TECHNOLOGY CENTER
MCCARRAN, NEVADA**

Submitted to:

**Nevada Division of Environmental Protection
Bureau of Air Pollution Control**
901 South Stewart Street, Suite 4001
Carson City, NV 89701

Prepared for:

SV RNO Property Owner 1, LLC
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Denver, CO 80209

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February 24, 2026

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1.0 INTRODUCTION AND SUMMARY

1.1 Introduction

SV RNO Property Owner 1, LLC ("SV RNO") is seeking authorization in the form of a new Class I operating permit to construct (OPTC) for the South Valley Technology Center (SVTC or Facility) to be located in McCarran, Nevada, with the following proposed equipment: a P1 Power Plant consisting of natural gas-fueled prime engines with combined rating estimated at 144 megawatts (MW), liquified natural gas (LNG) vaporizers, and diesel-fueled emergency black start engines (BSE) gensets with combined rating of 5.5 MW; diesel-fueled emergency backup data center (DC) engines with a combined rating estimated at 318 MW serving as backup power for a data center; Substation diesel-fueled emergency backup engines; fire pump engines; and associated diesel storage tanks. The detailed list of emission units to be covered by the Class I OPTC application are:

- Ninety (90) Aggreko Jenbacher J420 natural gas-fueled prime engines at the P1 Power Plant, rated at 2,146 bhp each (about 1.6 MW each) with selective catalytic reduction (SCR) and catalytic oxidizer (CatOx) emission controls;
- Two (2) Stabilis LNG vaporizer units at the P1 Power Plant, each with dual burners operating together, with a maximum utilization rate for vaporizing liquid fuel of 52 MMBtu/hr per unit;
- Four (4) Tier 4 Volvo Penta diesel-fueled emergency black start engine (BSE) gensets (each genset with two engines operating together) at the P1 Power Plant, each engine rated at 685 kW (932 bhp) and each genset at 1,370 kW (1,864 bhp), each with a 1,240-gallon diesel tank;
- One-hundred-six (106) Tier 4 Caterpillar 3516E (EM4718-02) diesel-fueled emergency backup engines at the Data Center, rated at 4,393 bhp each (3.0 MW each) at four (4) generator buildings, each with a 150-gallon diesel tank;
- Two (2) Tier 2 Caterpillar C32 Substation diesel-fueled emergency backup engines, rated at 1.25 MW each (about 1,676 bhp each), each with a 150-gallon diesel tank;
- Two (2) Tier 3 Clarke C18H0-UFAD12 diesel-fueled emergency fire pump engines, rated at 488 bhp (or 364 kW each), each with a 400-gallon diesel tank; and
- Fourteen (14) 40,000-gallon diesel storage tanks, located outside of the generator buildings. These tanks are covered under a separate Insignificant Activity (IA) application.

The proposed Facility will be located in the northeastern section of an approximately 1,519-acre parcel located in Storey County southwest of Highway 439 on Assessor's Parcel Number (APN) 0047-171-25. The site location is about 21 miles east of Reno and about 28 miles northeast of Carson City. Interstate 80 runs approximately 9 miles north of the site.

All of the diesel-fueled emergency engines, except for the fire pump engines, will be available under NV Energy's demand response (DR) program, which allows for 50 hours per year per engine of emergency use when called upon by NV Energy, in addition to the 50 hours allowed for non-emergency testing and maintenance.

The proposed Facility constitutes a minor source under the Prevention of Significant Deterioration (PSD) preconstruction permitting regulations and a new major source under the Title V operating permit regulations. SV RNO plans to permit the Facility as a Class I Synthetic Minor Source under the State of Nevada Minor New Source Review (NSR) program [Nevada Administrative Code (NAC) Chapter 445B]. The proposed site location in Storey County, Nevada is classified as attainment for all regulated NSR criteria pollutants. Attainment criteria pollutants include nitrogen oxides (NO_x and NO_2), carbon monoxide (CO), ozone [including precursors volatile organic compounds (VOC) and NO_x], particulate matter of less than 10 microns in diameter (PM_{10}), particulate matter of less than 2.5 microns in diameter ($\text{PM}_{2.5}$), and oxides of sulfur (SO_x and SO_2).

This Class I OPTC application contains the required information, analyses and demonstrations under the applicable state of Nevada and federal regulations. The Nevada Division of Environmental Protection (NDEP) Bureau of Air Pollution Control (BAPC) is the permitting authority for this Facility. NDEP/BAPC's permitting authority is explained in greater detail in Section 4.0 of this application.

1.2 Summary of Regulatory Items Affecting NDEP Review

An analysis was conducted to determine whether the Facility triggers specific NDEP review requirements, including whether the Facility will trigger federal NSR major source permitting thresholds or the federal Title V major source permitting thresholds. A summary of regulatory items affecting NDEP review is provided in this section. A regulatory compliance review presented in Section 4.0 discusses in detail the applicable federal and NDEP regulations that directly affect the Facility's permit application, the review process, and expected compliance requirements.

Facility annual potential-to-emit (PTE) emissions in tons per year (TPY) are summarized in Table 1, for comparison to NDEP review thresholds, the PSD NSR thresholds and the Class I (or Title V) permit thresholds. Detailed emission tables are provided in Section 3.0 of this application report and appendices. The PTE represents the maximum capacity of the Facility to emit pollutants, excluding secondary emissions, under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment, and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design, if the limitation or the effect it would have on the emissions is legally and practically enforceable by any rule, ordinance, order, or permit adopted or issued under NAC Chapter 445B.

TABLE 1 SOUTH VALLEY FACILITY POTENTIAL-TO-EMIT SUMMARY (TPY) COMPARISON TO NDEP THRESHOLDS			
Pollutant	Facility PTE	PSD Permit Threshold	Class I Permit Threshold
NO _x	130	250	100
CO	121	250	100
VOC	43.0	250	100
SO ₂	28.5	250	100
PM ₁₀	23.1	250	100
PM _{2.5}	23.1	250	100
CO ₂ e	643,087	100,000	100,000
HAPs (Individual)	37.3	--	10
HAPs (Combined)	45.0	--	25

Source: NDEP/BAPC Class I Air Quality Operating Permit Guidance Document, July 2021.

PTE = Potential-to-Emit, NSR = New Source Review, HAPs = Hazardous Air Pollutants, CO₂e = Carbon Dioxide Equivalent.

As shown in Table 1, Facility operations will not trigger federal PSD major NSR permitting requirements outlined in Code of Federal Regulations (CFR), Title 40, Section 51.166(b)(1)(i)(b), because facility-wide emissions will not equal or exceed 250 TPY for any attainment criteria pollutant. A Best Available Control Technology (BACT) analysis is not required for facilities that do not trigger federal PSD requirements, so a BACT analysis is not included in this application. The threshold for considering whether a facility is a PSD major source of greenhouse gas (GHG) emissions is 100,000 TPY, but only if emissions of a criteria pollutant first trigger NSR major source status. The Facility will not be a major source of any criteria pollutant under PSD.

The Facility will be a major source of NO_x and CO emissions exceeding the 100 TPY threshold, and hazardous air pollutants (HAPs) exceeding the thresholds of 10 TPY for individual HAP emissions and 25 TPY for all HAPs combined. The Facility will be required to obtain a Title V permit under the federal regulation 40 CFR Part 70. Therefore, the facility qualifies as a Class I facility. Greenhouse gas emissions do exceed 100,00 TPY; however, since the emissions of criteria pollutants do not trigger NSR major source status, Class I permit thresholds will not be exceeded.

Nevada Administrative Code (NAC) Section 445B.310 requires facilities applying for air operating permits that would have a PTE of greater than 25 TPY of at least one criteria pollutant to perform an environmental evaluation, which includes air dispersion modeling of the proposed Facility emissions impacts. As the proposed Facility would have a PTE of greater than 25 TPY of at least one criteria pollutant, air dispersion modeling of the facility has been performed in an Air Dispersion Modeling Analysis. Using air dispersion modeling, the analysis ensures the protection of the National Ambient Air Quality Standards (NAAQS) and the Nevada Ambient Air Quality Standards (NvAAQS). NDEP also requires that Class I Minor Sources, as well as PSD Major Sources, make a showing that the thresholds for available PSD NO₂ and PM₁₀

increments in the region will not be exceeded with the addition of Facility emissions. The Air Dispersion Modeling Report is included separately from this application report in Attachment C.

Appendix A includes the site layout and Facility figures. Detailed emission calculations for the Facility are included in Appendix B. Appendix C contains the manufacturer specifications for the proposed emission units.

1.3 Permit Application Required Content and Forms

This document is the South Valley Technology Center permit application to authorize the construction and operation of the Facility. Section 2.0 presents the proposed Facility and process description. Facility emissions and proposed limitations are presented in Section 3.0. Section 4.0 presents a regulatory applicability analysis. Section 5.0 includes proposed federally enforceable Class I OPTC permit limitations.

2.0 FACILITY AND PROCESS DESCRIPTION

This section provides an overview of the Facility and description of the proposed emission units.

2.1 Facility Overview

SV RNO is proposing to construct the SVTC Facility, consisting of a 144-MW power facility consisting of the P1 Power Plant, with natural gas-fueled prime engines, LNG vaporizers, and diesel-fueled black start engine (BSE) gensets; diesel-fueled emergency engines with a combined generation capacity at 100% load of 318 MW, serving as backup power for a data center; Substation emergency diesel-fueled engines; and fire pump engines, on a portion of an approximately 1,519-acre parcel in Storey County, Nevada. The proposed Facility design includes a P1 Power Plant with 90-2,146 brake-horsepower (bhp) (about 1.6 MW) Jenbacher J420 gas engines, 2 x 52 MMBtu/hr LNG dual burner vaporizers and 4 x 1,370 kW (1,864 bhp) diesel-fueled black start engines; 106-4,393 bhp (3.0 MW) Caterpillar 3516E Tier 4 diesel-fired emergency generators; 2 x 1.25 MW (1,676 bhp) Tier 2 Caterpillar C32 Substation emergency diesel generators; and 2 x 488 bhp (364 kW) Tier 3 Clarke C18H0-UFAD12 diesel-fired fire pump engines.

The P1 Power Plant site will be located on the southeast corner of the site, with the ninety (90) P1 engines distributed evenly on the site and the four (4) BSE gensets situated in the center. The two (2) vaporizer units will be located just northeast of the P1 site. SV RNO will construct one data center building, four generator buildings, and accessory structures. At full build-out, the two east generator buildings will include twenty-nine (29) DC engines each, and the two west buildings will include twenty-four (24) DC engines each. The engines will be powered by diesel fuel and/or equivalent renewable diesel fuel. A 150-gallon diesel tank will be attached to each of the DC Engines. The two Substation engines will be located onsite at the Substation. The two fire pump engines will be located onsite at the Security/Fire Building. The substation and fire pump engines will also have associated diesel tanks. The engines

will be operated periodically for equipment maintenance and testing purposes. The diesel tank units are insignificant activities (IAs). Site maps are included in Appendix A.

2.2 Facility Location

The proposed Facility will be located on the northeastern section of an approximately 1,519-acre parcel located in Storey County about 21 miles east of Reno and about 30 miles northeast of Carson City. Highway 439 runs approximately 0.2 miles northeast of the site, and Interstate 80 runs approximately 9 miles north of the site. Facility emission sources will be centered at about UTM 293415 m E, 4371533 m N, WGS84 Zone 11. The general location of the facility is shown in Figure 1. The proposed location, boundary, and generator locations at full buildout are shown in Figure 2. The site layout for the Facility is provided in Appendix A. The area immediately surrounding the site is generally characterized by mountainous terrain at about 5,520 feet (ft) above sea level. Terrain rises to the northeast and southwest of the Facility site. Industrial facilities are to the northeast of the Facility site.

The portion of Storey County where the Facility is located is classified as attainment for all criteria pollutants.



FIGURE 1. GENERAL LOCATION OF THE SOUTH VALLEY TECHNOLOGY CENTER FACILITY



FIGURE 2. SPECIFIC LOCATION OF THE SOUTH VALLEY TECHNOLOGY CENTER FACILITY

3.0 FACILITY EMISSIONS

The South Valley Technology Center (SVTC) will be a new stationary source. Therefore, the PTE of regulated attainment area NSR criteria pollutants from the proposed Facility equipment is used for air permitting purposes. The equipment proposed for the Facility includes installation of 90 x P1 engines, 2 x vaporizers, 4 x BSE gensets, 106 x DC engines, 2 x Substation engines, and 2 x fire pump engines. The facility will include a storage tank assigned to each diesel-fueled engine. This section describes the emissions calculations for regulated NSR criteria pollutants, greenhouse gases (GHGs) and HAPs.

3.1 Summary of Facility Emissions Units

Table 2 presents a summary of the proposed emissions units for the SVTC Facility.

TABLE 2 PROPOSED EMISSIONS UNITS FOR THE SOUTH VALLEY FACILITY			
Building/Area	System No.	Designation	Description
P1 Power Plant	1	J420_01-J420_90	P1 gas engines, 90 Units
	2	VAP1-VAP2	Vaporizers, 2 Units
	3	BSE1-BSE4; BSE_T_1-BSE_T_4	BSE Gensets, 4 Units, each with a 1,240-gallon diesel storage tank
Generator Building A	4	DCA_01-DCA_24; DC1A_T_01- DC1A_T_24	DC diesel engines, 24 Units; each with a 150-gallon diesel tank
Generator Building B	4	DCB_01-DCB_29; DC1B_T_01- DC1B_T_29	DC diesel engines, 29 Units; each with a 150-gallon diesel tank
Generator Building C	4	DCC_01-DCC_24; DC1C_T_01- DC1C_T_24	DC diesel engines, 24 Units; each with a 150-gallon diesel tank
Generator Building D	4	DCD_01-DCD_29; DC1D_T_01- DC1D_T_29	DC diesel engines, 29 Units; each with a 150-gallon diesel tank
Substation	5	C32_01-C32_02; C32_T_1-C32_T_2	Substation diesel engines, 2 Units; 2 x 150-gallon diesel tanks
Security/Fire Building	6	FIRE_1-FIRE_2; FIRE_T_1-FIRE_T_2	Fire pump diesel engines, 2 units; 2 x 400-gallon diesel tanks

3.2 Equipment Discussion

3.2.1 Prime Power Plant Natural Gas Engines

The proposed Facility will be equipped with ninety (90) Jenbacher J420 natural gas-fueled prime power engines which will provide the primary electrical generation capacity for the Facility. Each P1 engine is a 2,146 bhp, 1.6 MW, four-stroke lean burn (4SLB), spark-ignition reciprocating internal combustion engine (SI RICE) designed for continuous duty and high-efficiency operation. The engines operate on a lean-burn combustion strategy, which lowers combustion temperatures and reduces the formation of NO_x prior to exhaust treatment.

Aggreko will be responsible for operating the P1 Facility, providing full operational management of the onsite generation systems and associated emissions control equipment. As the Facility operator, Aggreko will oversee continuous operation of the engines, compliance with applicable air quality standards, and ongoing performance of all aftertreatment systems.

Each P1 engine will be equipped with a Selective Catalytic Reduction (SCR) system and a Catalytic Oxidizer (CatOx) to achieve compliance with the United States Environmental Protection Agency (USEPA) New Source Performance Standards (NSPS) for stationary spark-ignition internal combustion engines (40 CFR Part 60, Subpart JJJJ). The SCR system injects a urea-based solution into the exhaust stream, where it reacts over a catalyst to convert NO_x to nitrogen and water vapor. The oxidizing catalyst reduces CO and VOCs, including formaldehyde, through catalytic oxidation. Together, the SCR and CatOx systems provide high overall control efficiencies, ensuring that the engines meet stringent NO_x, CO, and VOC emission limits.

The P1 engines use filtered intake air compressed by pistons and ignited by spark plugs, with precisely metered natural gas fuel. Each engine cycle consists of an intake stroke, compression stroke, power stroke, and exhaust stroke, completed over two revolutions of the crankshaft. The J420 engine is a 20-cylinder, V-type configuration, optimized for high power density, stable lean-burn operation, and reduced fuel consumption during continuous 8,760-hour annual operation.

The P1 engines will burn natural gas fuel at a lower, derated, rate on an annual average basis due to the high base elevation (> 5,000 ft) of the Facility. The derated fuel use for the P1 engines (plus a 10% safety factor), is used to calculate the annual PTE emissions shown in Section 3.3.1, but the fully rated hourly fuel use is used to calculate short-term hourly emissions.

The P1 engines will be located in the southeast portion of the site, arranged to support the Facility's prime power needs. Exhaust gas temperatures under full-load operation typically reach 800–900°F, depending on ambient conditions and efficiency of the heat recovery and aftertreatment systems.

Table 3 summarizes the manufacturer-provided general specifications for the P1 engines. See Appendix C for manufacturer specifications.

TABLE 3 GENERAL SPECIFICATIONS FOR P1 ENGINES	
Parameter	Value
Model	Jenbacher J420
Number of Units	90
Power Output per Engine (MW)	1.6
Power Output per Engine (bhp)	2,146
Facility Output Power (Gross) Total (MW)	144
Fuel Input Rate (MMBtu/hr)	14.23

3.2.2 Prime Power Plant Stabilis LNG Vaporizer Units

The Facility P1 Power Plant will include two (2) Stabilis dual-burner LNG vaporizers that provide the on-site natural gas vaporization capacity required for continuous operation of the P1 engines. Each vaporizer will contain two natural-gas-fired burners, each with a maximum heat input of 26 MMBtu/hr (for a total of 52 MMBtu/hr per vaporizer unit) and is designed for continuous duty across the full range of expected ambient conditions. The site map in Appendix A shows three (3) vaporizer locations, but only two (2) vaporizers will be operating at one time in any of the 3 positions.

The vaporizers are forced-draft combustion units in which the burners heat a heat-transfer medium to vaporize LNG into pipeline-quality natural gas for fuel delivery. Each unit includes electronically controlled fuel metering and burner management systems to ensure stable combustion, with exhaust gases discharged through two dedicated vertical stacks.

The vaporizers are equipped with low-NO_x burner technology rated at 30 ppm, which limits NO_x formation through combustion staging and flame temperature control. Combustion follows a standard four-stage industrial process consisting of air injection, fuel metering and mixing, ignition, and steady-state combustion.

Table 4 summarizes the manufacturer-provided general specifications for the Stabilis dual burner 52 MMBtu/hr LNG vaporizers. See Appendix C for manufacturer specifications. While the Facility will site LNG storage tanks there will be no emissions from these tanks during normal operations; therefore, operation of the LNG tanks does not qualify as an insignificant activity.

TABLE 4 GENERAL SPECIFICATIONS FOR VAPORIZERS	
Parameter	Value
Model	Stabilis Dual Burner
Number of Units	2
Fuel Input Rate per Unit (MMBtu/hr)	52

3.2.3 Prime Power Plant Black Start Engines and Diesel Storage Tanks

The Facility P1 Power Plant will include four (4) Volvo Penta Tier 4 diesel-fueled black start engine (BSE) gensets, each rated at 1,370 kW (1,864 bhp). Each black start engine genset will consist of two engines that must operate together. These BSE gensets enable the P1 engines to be brought online following a loss of grid power. The Volvo Penta engines are Tier 4 compression-ignition reciprocating internal combustion engine (CI RICE) units, utilizing urea-based diesel exhaust fluid (DEF) for NO_x emissions control, an oxidation catalyst for VOC and CO emissions control and filters for particulate control. Each genset will be associated with a 1,240-gallon diesel tank, for a total of 4 tanks.

The engines will operate only during plant startup scenarios and during periodic testing and maintenance activities. Table 5 summarizes the manufacturer-provided general specifications for the BSE gensets. See Appendix C for manufacturer specifications.

TABLE 5 GENERAL SPECIFICATIONS FOR BSE GENSETS	
Parameter	Value
Model	Volvo Penta T4
Number of Units	4
Number of Engines per Unit	2
Power Output per Engine (kW)	685
Power Output per Unit (kW)	1,370
Power Output per Engine (bhp)	932
Power Output per Unit (bhp)	1,864
Fuel Input Rate per Engine (MMBtu/hr)	7.08
Fuel Input Rate per Unit (MMBtu/hr)	14.2

3.2.4 Data Center Emergency Engines and Diesel Storage Tanks

The proposed Facility will be equipped with 106 Caterpillar 3516E (EM4718-02) Tier 4 CI RICE units, which will provide backup power for the data center building. These engines are turbocharged, aftercooled, and operate on diesel fuel and/or equivalent renewable diesel. Each engine is rated to produce approximately 3.0 MW (4,394 bhp) of power. There will be 24 engines in each of the two west generator buildings and

29 in each of in the two east generator buildings. Each engine will be associated with a 150-gallon diesel tank, for a total of 106 tanks.

The Caterpillar 3516E Tier 4 engines are designed to meet USEPA Tier 4 nonroad diesel engine emission standards through engine-integrated, in-cylinder control technologies. These include advanced electronic fuel injection, optimized combustion chamber design, air/fuel ratio management, and turbocharging. SCR and OxCat emissions control systems are incorporated into each of these engines. In the SCR process, a urea-based DEF is injected into the exhaust stream, where it reacts over a catalyst to convert nitrogen oxides NO_x to nitrogen and water vapor. The oxidizing catalyst reduces CO and VOCs, including formaldehyde, through catalytic oxidation. These aftertreatment systems significantly reduce NO_x emissions beyond what can be achieved through combustion optimization alone.

Modern RICE units like the 3516E are four-stroke internal combustion engines, in which filtered intake air is compressed by a piston and fuel is injected directly into the cylinder. The fuel self-ignites due to the high pressure and temperature—a process known as compression ignition. Each engine cycle consists of an intake stroke, compression stroke, power stroke, and exhaust stroke, completed over two revolutions of the crankshaft.

The Caterpillar 3516E engine is a 16-cylinder, four-stroke, V-type diesel engine, widely used in industrial power generation, oil and gas production, and other high-duty-cycle applications. Exhaust gases exit the engine under full load conditions at temperatures typically up to 1,000 °F, depending upon ambient conditions. These engines are representative of the durable, fuel-efficient designs used across a broad range of industrial and utility-scale power generation applications.

The DC engines will be operated periodically for equipment maintenance and testing purposes and for emergency demand-response up to the maximum hourly fuel use, at 100% load for up to 100 hours per year. Table 6 summarizes the manufacturer-provided general specifications for the Caterpillar 3516E Tier 4 engine at maximum fuel use and 100% rated load. See Appendix C for manufacturer specifications.

TABLE 6 GENERAL SPECIFICATIONS FOR DATA CENTER ENGINES	
Parameter	Value
Model	Caterpillar 3516E
Number of Units	106
Power Output per Engine (MW)	3.0
Power Output per Engine (bhp)	4,393
Facility Output Power (Gross) Total (MW)	318
100% Load Fuel Consumption (gal/hr)	204.3
100% Load Fuel Consumption (MMBtu/hr)	28.1
Maximum Annual Fuel Usage (gallons/year)	20,430

3.2.5 Substation Engines and Diesel Storage Tanks

Two Tier 2 Caterpillar C32 backup diesel-fired generators, with an estimated backup maximum output rating of 1.25 MW (1,676 bhp) each will be installed at the Facility Substation. Each engine will be associated with a 150-gallon diesel tank, for a total of 2 tanks.

The Caterpillar C32 is a compression ignition, reciprocating internal combustion engine. The engines will act as emergency backup power for operations not involving data center server power loads. The engines will be operated periodically for equipment maintenance and testing purposes and for emergency demand-response up to the maximum hourly fuel use, at 100% load for up to 100 hours per year. The specifications for the proposed substation engines are summarized in Table 7. See Appendix C for manufacturer specifications.

TABLE 7 GENERAL SPECIFICATIONS FOR SUBSTATION ENGINES	
Parameter	Value
Model	Caterpillar C32
Number of Units	2
Output Power per Unit (MW)	1.25
Output Power per Unit (bhp)	1,676
100% Load Fuel Consumption (gal/hr)	87.4
100% Load Fuel Consumption (MMBtu/hr)	12.0
Maximum Annual Fuel Use (gallons/year)	8,740

3.2.6 Fire Pump Diesel Engines and Diesel Storage Tanks

Two Tier 3 C18H0-UFAD12 Clark diesel-fired fire pump engines, with an estimated backup maximum output rating of 488 bhp (364 kW) each will be installed at the Security/Fire Building. Each engine will be associated with a 400-gallon diesel tank, for a total of 2 tanks.

The 364 kW Clark engines are compression ignition, reciprocating internal combustion engines and will drive the water pump to serve the Facility's fire emergency needs. The engines will also be operated periodically for equipment maintenance and testing purposes. The estimated specifications for the proposed fire pump engines are summarized in Table 8. See Appendix C for manufacturer specifications.

TABLE 8 GENERAL SPECIFICATIONS FOR FIRE PUMP ENGINES	
Parameter	Value
Model	Clarke UFAD12
Number of Units	2
Output Power per Unit (kW)	364
Output Power per Unit (bhp)	488
100% Load Fuel Consumption (gal/hr)	31.5
100% Load Fuel Consumption (MMBtu/hr)	4.32
Maximum Annual Fuel Use (gallons/year)	1,260

3.3 Regulated Pollutants

This section summarizes PTE calculations and resulting emission rates for regulated New Source Review (NSR) criteria pollutants and greenhouse gases (GHGs) from the units proposed as part of the South Valley Technology Center. The regulated NSR pollutants included here are NO_x, CO, VOC, SO₂, PM₁₀, PM_{2.5} and GHGs as carbon dioxide equivalent (CO₂e).

3.3.1 Jenbacher J420 Prime Power Natural Gas Engine NSR Pollutant Emissions

A summary of NSR pollutant emissions from the P1 Power Plant natural gas-fueled engines is presented in this section. Each engine will operate for up to 8,760 hours per year at the maximum hourly fuel rate at 100% load. The short-term (hourly to daily, or 24-hour) PTE of regulated NSR pollutants for the proposed engines are based upon the bhp rating, and fuel consumption at 100% load (MMBtu/hr) per engine; and the uncontrolled emission factors provided by the manufacturer and obtained from USEPA AP-42. The long-term (annual) PTE of regulated NSR pollutants for the proposed engines are based upon the derated fuel usage of the engines at a high altitude, per engine, with a 10% safety factor; and the uncontrolled emission factors provided by the manufacturer and obtained from USEPA AP-42. The control efficiencies for NO_x, CO and VOC due to the SCR and OxCat controls were provided by the manufacturer.

Table 9 presents the maximum controlled hourly NSR pollutant emissions for the proposed Jenbacher J420 prime power engines.

TABLE 9 JENBACHER J420 – MAXIMUM CONTROLLED HOURLY NSR POLLUTANT EMISSIONS PER PRIME POWER ENGINE	
Pollutant	Hourly Emissions (lb/hr)
NO _x	0.24
CO	0.25
VOC	0.09
PM ₁₀	0.05
PM _{2.5}	0.05
SO ₂	0.07
CO _{2e}	1,567

Maximum uncontrolled and controlled emission rates for NO_x, CO, VOC, SO_x, PM₁₀, PM_{2.5}, and CO_{2e} for the proposed engines are detailed in the PTE calculations in Appendix B. These are based on 100% load condition, at site elevation.

The PTE of regulated NSR criteria pollutants from the P1 engines using the derated fuel usage emission rates and based upon each engine operating for 8,760 hours per year, are summarized in Table 10.

TABLE 10 JENBACHER J420 – DERATED CONTROLLED ANNUAL NSR POLLUTANT EMISSIONS PER PRIME POWER ENGINE	
Pollutant	Annual Emissions (TPY)
NO _x	1.04
CO	1.08
VOC	0.41
PM ₁₀	0.21
PM _{2.5}	0.21
SO ₂	0.31
CO _{2e}	6,863

3.3.2 Stabilis Dual Burner LNG Vaporizer NSR Pollutant Emissions

A summary of NSR pollutant emissions from the dual-burner LNG vaporizer units is presented in this section. Each vaporizer will operate for up to 8,760 hours per year. The short-term (hourly to daily, or 24-hour) and annual PTE of regulated NSR pollutants for the proposed vaporizers are based upon the maximum burn rate of each burner and the emission factors provided by the manufacturer. Table 11 presents the maximum hourly NSR pollutant emissions for the proposed Stabilis dual burner LNG vaporizer units, per unit.

TABLE 11 STABILIS LNG VAPORIZER – MAXIMUM HOURLY NSR POLLUTANT EMISSIONS PER UNIT	
Pollutant	Hourly Emissions (lb/hr)
NO _x	1.92
CO	1.92
VOC	0.28
PM ₁₀	0.39
PM _{2.5}	0.39
SO ₂	0.03
CO ₂ e	10.9

Maximum emission rates for NO_x, CO, VOC, SO_x, PM₁₀, PM_{2.5}, and CO₂e for the proposed vaporizers are detailed in the PTE calculations in Appendix B. These are based on a maximum burn rate of 52 MMBtu/hr per unit.

The maximum annual emissions (or PTE) of regulated NSR criteria pollutants from the vaporizers using the maximum hourly emission rates shown above and based upon each vaporizer unit operating for 8,760 hours per year are summarized in Table 12.

TABLE 12 STABILIS LNG VAPORIZER – MAXIMUM ANNUAL NSR POLLUTANT EMISSIONS PER UNIT	
Pollutant	Annual Emissions (TPY)
NO _x	8.43
CO	8.43
VOC	1.23
PM ₁₀	1.71
PM _{2.5}	1.71
SO ₂	0.14
CO ₂ e	47.9

3.3.3 Volvo Penta T4 Black Start Engine Genset NSR Pollutant Emissions

A summary of NSR pollutant emissions from the dual-engine BSE gensets is presented in this section. Each BSE genset will operate for testing and maintenance and emergency demand-response up to the maximum hourly fuel use, at 100% load for up to 100 hours per year. Each BSE genset consists of two 685 kW engines. The short-term (hourly to daily, or 24-hour) and annual PTE of regulated NSR pollutants for the proposed BSE gensets are based upon the kW rating, and fuel consumption at 100% load (MMBtu/hr) per genset; and the Tier 4 controlled emission factors provided by the manufacturer and uncontrolled emission factors obtained from

USEPA AP-42. Table 13 presents the maximum controlled hourly NSR pollutant emissions for the proposed Volvo BSE gensets.

TABLE 13 VOLVO 1,370 KW BSE – MAXIMUM CONTROLLED HOURLY NSR POLLUTANT EMISSIONS PER BLACK START ENGINE GENSET	
Pollutant	Hourly Emissions (lb/hr)
NO _x	1.21
CO	0.20
VOC	0.04
PM ₁₀	0.04
PM _{2.5}	0.04
SO ₂	0.02
CO _{2e}	2,342

Maximum uncontrolled and controlled emission rates for NO_x, CO, VOC, SO_x, PM₁₀, PM_{2.5}, and CO_{2e} for the proposed BSE gensets are detailed in the PTE calculations in Appendix B. These are based on 100% load condition, at site elevation. While the BSE gensets will likely operate one hour per day or less for testing and maintenance, those operations could occur at any time of day. An emergency demand-response situation, such as Energy Emergency Alert (EEA) Levels 1 or 2, could occur at any time.

The maximum controlled annual emissions (or PTE) of regulated NSR criteria pollutants from the BSE gensets using the maximum hourly emission rates shown above and based upon the equivalent of engine operations of 100 hours per year at 100% load, are summarized in Table 14.

TABLE 14 VOLVO 1,370 KW BSE GENSET – MAXIMUM ANNUAL NSR POLLUTANT EMISSIONS PER BLACK START ENGINE GENSET	
Pollutant	Annual Emissions (TPY)
NO _x	0.06
CO	0.01
VOC	0.002
PM ₁₀	0.002
PM _{2.5}	0.002
SO ₂	0.001
CO _{2e}	117

3.3.4 Caterpillar 3516E Data Center Engine NSR Pollutant Emissions

A summary of NSR pollutant emissions from the DC engines is presented in this section. Each DC engine will operate for testing and maintenance and emergency demand-response up to the maximum hourly fuel use, at 100% load for up to 100 hours per year. The short-term (hourly to daily, or 24-hour) and annual PTE of regulated NSR pollutants for the proposed engines are based upon the bhp rating, and fuel consumption at 100% load (MMBtu/hr) per engine; and the uncontrolled emission factors provided by the manufacturer and obtained from USEPA AP-42. The control efficiencies for PM_{2.5}, PM₁₀, NO_x and CO due to the particulate filters, SCR, and OxCat controls were provided by the manufacturer. Table 15 presents the maximum controlled hourly NSR pollutant emissions for the proposed Caterpillar 3516E Tier 4 engines.

TABLE 15 CATERPILLAR 3516E – MAXIMUM HOURLY NSR POLLUTANT EMISSIONS PER DATA CENTER ENGINE	
Pollutant	Hourly Emissions (lb/hr)
NO _x	3.27
CO	1.28
VOC	0.58
PM ₁₀	0.19
PM _{2.5}	0.19
SO ₂	0.04
CO ₂ e	4,646

Maximum uncontrolled and controlled emission rates for NO_x, CO, VOC, SO_x, PM₁₀, PM_{2.5}, and CO₂e for the proposed engines are detailed in the PTE calculations in Appendix B. These are based on 100% load condition, at site elevation. While the engines will likely operate one hour per day or less for testing and maintenance, those operations could occur at any time of day. An emergency demand-response situation, such as EEA Levels 1 or 2, could occur at any time.

The maximum controlled annual emissions (or PTE) of regulated NSR criteria pollutants from the engines using the maximum hourly emission rates shown above, and the maximum annual fuel use based upon the equivalent of engine operations of 100 hours per year at 100% load, are summarized in Table 16.

TABLE 16 CATERPILLAR 3516E – MAXIMUM ANNUAL NSR POLLUTANT EMISSIONS PER DATA CENTER ENGINE	
Pollutant	Total Emissions (TPY)
NO _x	0.16
CO	0.06
VOC	0.03
PM ₁₀	0.01
PM _{2.5}	0.01
SO _x	0.002
CO _{2e}	232

3.3.5 Caterpillar C32 Substation Engine NSR Pollutant Emissions

A summary of NSR pollutant emissions from the Substation engines are presented in this section. Each engine will operate for testing and maintenance and emergency demand-response up to the maximum hourly fuel use stated in Section 3.2.5, based upon 100% load for up to 100 hours per year. The short-term (hourly to daily, or 24-hour) and annual PTE of regulated NSR pollutants for the proposed engines are based upon the bhp, and fuel consumption at 100% load (MMBtu/hr) per engine; and the uncontrolled emission factors provided by the manufacturer and obtained from USEPA AP-42. Table 17 presents the hourly emissions information used for this application for the proposed Caterpillar C32 Tier 2 engines.

TABLE 17 CATERPILLAR C32 – MAXIMUM HOURLY NSR POLLUTANT EMISSIONS PER SUBSTATION ENGINE	
Pollutant	Hourly Emissions (lb/hr)
NO _x	22.9
CO	0.78
VOC	0.37
PM ₁₀	0.07
PM _{2.5}	0.07
SO ₂	0.02
CO _{2e}	1,982

Maximum emission rates for NO_x, CO, VOC, SO_x, PM₁₀, PM_{2.5}, and CO_{2e} for the proposed engines are detailed in the PTE calculations in Appendix B. These are based on 100% load condition, at site elevation. While the engines will likely operate one hour per day or less for testing and maintenance, those operations could occur at any time of day. An emergency demand-response situation, such as EEA Levels 1 or 2, could occur at any time.

The maximum annual emissions (or PTE) of regulated NSR pollutants from the engines during normal operation using the conservative emission rates shown above, and the maximum annual fuel usage, based upon engine operations at an equivalent of 100 hours per year at 100% load are summarized in Table 18.

TABLE 18 CATERPILLAR C32 – MAXIMUM ANNUAL NSR POLLUTANT EMISSIONS PER SUBSTATION ENGINE	
Pollutant	Annual Emissions (TPY)
NO _x	1.15
CO	0.04
VOC	0.02
PM ₁₀	0.004
PM _{2.5}	0.004
SO ₂	0.0009
CO _{2e}	99.1

3.3.6 Fire Pump Engine NSR Pollutant Emissions

The proposed fire pump engines will be USEPA-certified Tier 3 units as required in 40 CFR §60.4205(c), and subject to the emissions standards in Table 4 of 40 CFR 60 Subpart IIII for NO_x, CO, VOC, and PM. For emissions calculations, the short-term and annual PTE of regulated NSR pollutant emissions for the fire pump engines are based upon the rating, and fuel consumption at 100% load; and the uncontrolled emission factors provided by the manufacturer and obtained from USEPA AP-42. Table 19 presents the hourly emissions information used for this application for the proposed Clarke fire pump Tier 3 engines.

TABLE 19 CLARKE UFAD12 – MAXIMUM HOURLY NSR POLLUTANT EMISSIONS PER FIRE PUMP ENGINE	
Pollutant	Hourly Emissions (lb/hr)
NO _x	2.36
CO	1.52
VOC	0.14
PM ₁₀	0.16
PM _{2.5}	0.16
SO ₂	1.00
CO _{2e}	710

Maximum emission rates for NO_x, CO, VOC, SO_x, PM₁₀, PM_{2.5}, and CO_{2e} for the proposed fire pump engines are detailed in the PTE calculations in Appendix B. These are based on 100% load condition, at site elevation. While the engine will likely operate one hour per day or less for testing and maintenance, those operations could occur at any time of day.

The maximum annual emissions (PTE) of regulated NSR pollutants from the engines during normal operation using the conservative emission rates shown above and based upon the maximum annual fuel usage stated in Section 3.2.6, based upon the equivalent of engine operations of 40 hours per year at 100% load, are summarized in Table 20.

TABLE 20 CLARKE UFAD12 – MAXIMUM ANNUAL NSR POLLUTANT EMISSIONS PER FIRE PUMP ENGINE	
Pollutant	Annual Emissions (TPY)
NO _x	0.05
CO	0.03
VOC	0.003
PM ₁₀	0.003
PM _{2.5}	0.003
SO ₂	0.02
CO _{2e}	14.2

3.3.7 Summary of Facility Potential-to-Emit of Regulated NSR Pollutants

Table 21 summarizes the annual controlled PTE of regulated NSR pollutants for the South Valley Technology Facility for all engines. Detailed uncontrolled and controlled emissions calculations are provided in Appendix

TABLE 21 SUMMARY OF MAXIMUM CONTROLLED ANNUAL EMISSIONS OF NSR POLLUTANTS FOR THE SOUTH VALLEY TECHNOLOGY FACILITY (TPY)							
Pollutants	Jenbacher J420 2,146 bhp	Stabilis LNG Vaporizers 52 MMBtu/hr	Volvo BSEs 1,370 kW	CAT 3516E 3.0 MW	CAT C32 1.25 MW	Clarke Fire Pumps 488 bhp	Total Facility PTE
NO _x	93.7	16.9	0.24	17.4	2.29	0.094	130
CO	97.0	16.9	0.04	6.78	0.08	0.061	121
VOC	37.3	2.46	0.008	3.08	0.04	0.006	43.0
PM ₁₀	18.7	3.42	0.008	1.03	0.007	0.006	23.1
PM _{2.5}	18.7	3.42	0.008	1.03	0.007	0.006	23.1
SO ₂	28.0	0.27	0.004	0.23	0.002	0.04	28.5
CO ₂ e	617,672	95.7	468	24,624	198	28.4	643,087

Maximum controlled annual PTE of all criteria pollutants will be below the PSD threshold of 250 TPY, but PTE of NO_x and CO is above the Class I Title V threshold of 100 TPY.

3.4 Hazardous Air Pollutants Emissions

HAP emissions from the proposed emissions units under the South Valley Technology Center are presented in this section.

3.4.1 Natural Gas Combustion HAP Emissions

Combustion of natural gas in the P1 Power Plant engines and in the LNG vaporizers will form HAP emissions. For the P1 engines, the emission factors of the HAP species (except formaldehyde) are based on the list of speciated organic compounds for natural gas-fired Reciprocating Engines, 4-stroke lean burn from USEPA AP-42 Chapter 3.2. The formaldehyde emission factor for the P1 engines was provided by the manufacturer. The control efficiencies for the P1 engines were assumed 80% for all HAPs except formaldehyde due to the OxCat controls. A 90% control efficiency was assumed for formaldehyde, as stated by the engine manufacturer.

For the vaporizer units, the emission factors of the HAP species are based on the list of speciated organic compounds and particulate matter for natural gas combustion from USEPA AP-42 Chapter 1.4. No control efficiencies were applied for the HAPs calculations for the vaporizer units.

3.4.2 Diesel Engine HAP Emissions

Combustion of diesel fuel in the DC engines, BSE gensets, Substation engines, and fire pump engines will form HAP emissions. For the DC, BSE, and Substation engines, which are rated greater than 600 horsepower, emission factors of HAP species are based on the list of speciated organic compounds and polycyclic aromatic hydrocarbons (PAHs) for large uncontrolled stationary diesel engines from USEPA AP-42, Chapter 3.4. For the fire pump engines which are less than 600 horsepower, HAP species and emission factors are based on the AP-42, Chapter 3.3. No control efficiencies were applied for any of the diesel engine HAP emissions calculations.

3.4.3 Summary of Source-Wide HAPs Emissions

Table 22 presents the total maximum controlled annual (PTE) HAP emissions from the South Valley Technology Center. Detailed uncontrolled and controlled emissions calculations are provided in Appendix B.

TABLE 22 SUMMARY OF MAXIMUM CONTROLLED ANNUAL HAP EMISSIONS FOR THE SOUTH VALLEY TECHNOLOGY FACILITY								
HAP	CAS #	Emissions (TPY)						
		Jenbacher J420 2,146 bhp	Stabilis LNG Vaporizers 52 MMBtu/hr	Volvo BSE Gensets 1,370 kW	CAT 3516E 3.0 MW	CAT C32 1.25 MW	Clarke Fire Pumps 488 bhp	Total Facility PTE
1,1,2,2-Tetrachloroethane	79345	4.49E-02	--	--	--	--	--	4.49E-02
1,1,2-Trichloroethane	79005	3.57E-02	--	--	--	--	--	3.57E-02
1,3-Butadiene	106990	3.00E-01	--	--	--	--	5.34E-06	3.00E-01
1,3-Dichloropropene	542756	2.96E-02	--	--	--	--	--	2.96E-02
7,12-Dimethylbenz(a)anthracene	57976	--	7.15E-06	--	--	--	--	7.15E-06
2,2,4-Trimethylpentane	540841	2.80E-01	--	--	--	--	--	2.80E-01
2-Methylnaphthalene	91576	3.72E-02	1.07E-05	--	--	--	--	3.73E-02
3-Methylcholanthrene	56495	--	8.04E-07	--	--	--	--	8.04E-07
Acenaphthene	83329	1.40E-03	8.04E-07	--	--	--	--	1.40E-03
Acenaphthylene	208968	6.20E-03	8.04E-07	--	--	--	--	6.20E-03
Acetaldehyde	75070	--	--	7.13E-05	3.75E-03	3.02E-05	1.05E-04	3.95E-03
Acrolein	107028	--	--	2.23E-05	1.17E-03	9.44E-06	1.26E-05	1.22E-03
Anthracene	102127	--	1.07E-06	--	--	--	--	1.07E-06
Arsenic	7440382	--	8.93E-05	--	--	--	--	8.93E-05
Benzene	71432	4.94E-01	9.38E-04	2.20E-03	1.15E-01	9.29E-04	1.27E-04	6.13E-01
Benz(a)anthracene	56553	--	8.04E-07	--	--	--	--	8.04E-07
Benzo(a)pyrene	50328	--	5.36E-07	--	--	--	--	5.36E-07
Benzo(b)fluoranthene	205992	1.86E-04	8.04E-07	--	--	--	--	1.87E-04
Benzo(e)pyrene	192972	4.66E-04	--	--	--	--	--	4.66E-04
Benzo(g,h,i)perylene	191242	4.64E-04	--	--	--	--	--	4.64E-04
Beryllium	7440417	--	5.36E-06	--	--	--	--	5.36E-06
Biphenyl	92524	2.38E-01	--	--	--	--	--	2.38E-01

TABLE 22 SUMMARY OF MAXIMUM CONTROLLED ANNUAL HAP EMISSIONS FOR THE SOUTH VALLEY TECHNOLOGY FACILITY								
HAP	CAS #	Emissions (TPY)						
		Jenbacher J420 2,146 bhp	Stabilis LNG Vaporizers 52 MMBtu/hr	Volvo BSE Gensets 1,370 kW	CAT 3516E 3.0 MW	CAT C32 1.25 MW	Clarke Fire Pumps 488 bhp	Total Facility PTE
Cadmium	7440439	--	4.91E-04	--	--	--	--	4.91E-04
Carbon Tetrachloride	56235	4.12E-02	--	--	--	--	--	4.12E-02
Chlorobenzene	108907	3.41E-02	--	--	--	--	--	3.41E-02
Chloroform	67663	3.20E-02	--	--	--	--	--	3.20E-02
Chromium	7440472	--	6.25E-04	--	--	--	--	6.25E-04
Chrysene	218019	7.77E-04	8.04E-07	--	--	--	--	7.78E-04
Cobalt	7440484	--	3.75E-05	--	--	--	--	3.75E-05
Dibenzo(a,h)anthracene	53703	--	5.36E-07	--	--	--	--	5.36E-07
Dichlorobenzene	25321226	--	5.36E-04	--	--	--	--	5.36E-04
Ethylbenzene	100414	4.45E-02	--	--	--	--	--	4.45E-02
Ethylene Dibromide	106934	4.97E-02	--	--	--	--	--	4.97E-02
Fluoranthene	206440	1.25E-03	1.34E-06	--	--	--	--	1.25E-03
Fluorene	86737	6.36E-03	1.25E-06	--	--	--	--	6.36E-03
Formaldehyde	50000	3.73E+01	3.35E-02	2.23E-04	1.17E-02	9.45E-05	1.61E-04	3.73E+01
Indeno(1,2,3-c,d)pyrene	193395	--	8.04E-07	--	--	--	--	8.04E-07
Lead	7439921	--	2.23E-04	--	--	--	--	2.23E-04
Manganese	7439965	--	1.70E-04	--	--	--	--	1.70E-04
Mercury	7439976	--	1.16E-04	--	--	--	--	1.16E-04
Methanol	67561	2.80E+00	--	--	--	--	--	2.80E+00
Methylene Chloride	75092	2.24E-02	--	--	--	--	--	2.24E-02
n-Hexane	110543	1.25E+00	8.04E-01	--	--	--	--	2.05E+00
Naphthalene	91203	8.35E-02	2.72E-04	3.68E-04	1.93E-02	1.56E-04	1.16E-05	1.04E-01
Nickel	7440020	--	9.38E-04	--	--	--	--	9.38E-04
Total PAH	1151	3.02E-02	--	6.00E-04	3.15E-02	2.54E-04	2.30E-05	6.26E-02

TABLE 22 SUMMARY OF MAXIMUM CONTROLLED ANNUAL HAP EMISSIONS FOR THE SOUTH VALLEY TECHNOLOGY FACILITY								
HAP	CAS #	Emissions (TPY)						
		Jenbacher J420 2,146 bhp	Stabilis LNG Vaporizers 52 MMBtu/hr	Volvo BSE Gensets 1,370 kW	CAT 3516E 3.0 MW	CAT C32 1.25 MW	Clarke Fire Pumps 488 bhp	Total Facility PTE
Phenanthrene	85018	1.17E-02	7.59E-06	--	--	--	--	1.17E-02
Phenol	108952	2.69E-02	--	--	--	--	--	2.69E-02
Pyrene	129000	1.53E-03	2.23E-06	--	--	--	--	1.53E-03
Selenium	7782492	--	1.07E-05	--	--	--	--	1.07E-05
Styrene	100425	2.65E-02	--	--	--	--	--	2.65E-02
Perchloroethylene	127184	2.78E-03	--	--	--	--	--	2.78E-03
Toluene	108883	4.58E-01	1.52E-03	7.35E-04	4.18E-02	3.36E-04	5.59E-05	5.02E-01
Vinyl Chloride	75014	1.67E-02	--	--	--	--	--	1.67E-02
Xylenes	1330207	2.06E-01	--	5.46E-04	2.87E-02	2.31E-04	3.89E-05	2.36E-01
Total HAPs								45.0

* Formaldehyde, which is the highest single HAP, is bolded in the table.

The Facility maximum PTE of a single HAP (formaldehyde) is 37.3 TPY, which is above the Class I threshold of 10 TPY. The total PTE of all HAPs is 45.0 TPY, which is above the Class I threshold of 25 TPY. Because Facility-wide HAP emissions exceed the major-source thresholds of 10 TPY for any single HAP and 25 TPY for total combined HAPs, the Facility is subject to the Maximum Achievable Control Technology (MACT) requirements under 40 CFR Part 63, including Subpart ZZZZ for stationary reciprocating internal combustion engines.

4.0 REGULATORY APPLICABILITY REVIEW

A review of the potentially applicable federal and NDEP regulations has been conducted for the proposed South Valley Technology Center. The following subsections summarize the applicability of these regulations to the proposed Facility.

4.1 State Regulations

4.1.1 New Source Review

The NDEP has incorporated the federal New Source Review (NSR) program for new and modified sources of air emissions in the Nevada Administrative Code (NAC) Chapter 445B. The NSR program establishes preconstruction permitting requirements. There are three types of NSR permits: Prevention of Significant Deterioration (PSD) for new major sources in attainment areas, nonattainment NSR for new major sources in nonattainment areas, and minor NSR for smaller sources.

The Facility is located in an unclassified and/or attainment area for all criteria air pollutants. Therefore, nonattainment NSR is not applicable to the Facility. Based on the estimated PTE in Section 3.0, the Facility's site-wide PTE for one or more regulated criteria pollutants will not exceed the 250 tons per year threshold for PSD NSR major sources. Therefore, the Facility's sources are not subject to the consideration of best available control technology (BACT). Although the Facility is not a major source under the state NSR program, it is a major source of HAPs under federal regulations. Federal MACT applicability is addressed in Section 4.2.

4.1.2 Air Dispersion Modeling Analysis (NAC 445B.310)

Nevada Administrative Code (NAC) Section 445B.310 requires facilities applying for air operating permits that would have a PTE of greater than 25 TPY of at least one criteria pollutant to perform an environmental evaluation, which includes air dispersion modeling of the proposed Facility emissions impacts. As the proposed South Valley Technology Center would have a PTE of greater than 25 TPY of at least one criteria pollutant, air dispersion modeling of the facility has been performed in an air dispersion modeling analysis. Using air dispersion modeling, the analysis ensures the protection of the NAAQS and the NvAAQS. NDEP also requires that Class I Minor Sources, as well as PSD Major Sources, make a showing that the thresholds for available PSD NO₂ and PM₁₀ increments in the region will not be exceeded with the addition of Facility emissions.

The emissions impacts associated with the Facility were analyzed pursuant to NDEP modeling requirements and the NDEP/BAPC *Class I Air Quality Operating Permit Guidance Document*, dated July 2021 following the NDEP's *General Air Dispersion Modeling Guidelines*, dated September 2008 and the USEPA *Guideline on Air Quality Models* (40 CFR 51, Appendix W). The modeling analysis was conducted to demonstrate that impacts from NO_x, CO, SO₂, PM₁₀ and PM_{2.5} comply with the NAAQS and NvAAQS, for the applicable averaging periods. Ozone impacts were determined using the Scheffe screening method, detailed in the NDEP modeling guidelines. A PSD increment consumption analysis was completed for NO₂ and PM₁₀ emissions from the Facility. The Air Dispersion Modeling Report is included separately from this application report in Attachment C.

4.1.3 Emissions of Particulate Matter (NAC 445B.2203)

All Facility fuel-burning equipment including P1 engines, LNG vaporizers, BSE gensets, DC engines, Substation engines, and fire pump engines are subject to NAC 445B.2203, which states that allowable PM₁₀ emissions resulting from the combustion of fuel in fuel-burning equipment must be limited to the amount calculated by the following equation for equipment with a maximum heat input of greater than 10 MMBtu/hr but less than 4,000 MMBtu/hr:

$$Y = 1.02X^{-0.231}$$

Where: X = maximum operating rate in MMBtu/hr
Y = allowable rate of emission in lb/MMBtu

All fuel-burning equipment will comply with NAC 445B.2203.

4.1.4 Sulfur Emissions (NAC 445B.22047)

All Facility fuel-burning equipment including P1 engines, LNG vaporizers, BSE gensets, DC engines, Substation engines, and fire pump engines are subject to NAC 445B.22047, which states that allowable sulfur emissions resulting from the combustion of fuel in fuel-burning equipment must be limited to the amount calculated by the following equation for equipment with a maximum heat input of less than 250 MMBtu/hr:

$$Y = 0.7X$$

Where: X = maximum operating input of heat in MMBtu/hr
Y = allowable rate of emissions in lb/hr

The Facility will combust ultra-low sulfur diesel (ULSD) in all diesel-fired engines and pipeline-quality natural gas in the P1 engines and the LNG vaporizers. Both fuels contain extremely low sulfur content—ULSD contains ≤15 ppm sulfur, and pipeline natural gas typically contains sulfur in the grains-per-hundreds-of-cubic-feet range—resulting in SO₂ emissions that are far below the allowable limits calculated under NAC 445B.22047.

Emissions estimates provided in Appendix B confirm that sulfur dioxide emissions from all applicable fuel-burning equipment are well below both the equipment-specific allowable rates and the Facility-wide SO₂ potential-to-emit. Accordingly, all fuel-burning equipment at the Facility complies with the sulfur emission requirements of NAC 445B.22047.

4.1.5 Hazardous Air Pollutants and Toxic Regulated Air Pollutants: Prohibited Discharge (NAC 445B.22013)

NAC 445B.22013 prohibits the discharge of HAPs and toxic regulated air pollutants except when those emissions occur in accordance with applicable federal emission standards. The Facility will combust ULSD in all diesel-fired engines, and low-sulfur pipeline-quality commercial natural gas in the P1 engines and LNG vaporizers, which minimizes HAP emissions.

As shown in Table 22, the Facility's potential-to-emit exceeds the major-source thresholds of 10 TPY for a single HAP and 25 TPY for combined HAPs, and therefore the Facility is subject to the major-source NESHAP requirements under 40 CFR Part 63. Compliance with the applicable federal MACT standards—including those under Subpart ZZZZ for stationary RICE—fulfills the prohibition in NAC 445B.22013, as the rule allows HAP emissions only when federal standards are met.

The Facility will comply with all applicable federal MACT requirements identified in Section 4.2, thereby ensuring compliance with NAC 445B.22013.

4.1.6 Exemptions from Requirements, Insignificant Activities (NAC 445B.288)

The 150-gallon diesel tanks attached to the DC engines and substation engines, the 1,240-gallon tanks for the BSE gensets, and the 400-gallon tanks for the fire pump engines are exempt from permitting requirements under NAC 445B.288(2)(d), which exempts storage containers for petroleum liquids with a capacity of less than 40,000 gallons.

The Facility will also include fourteen (14) 40,000-gallon diesel storage tanks, each of which exceeds the exemption threshold in NAC 445B.288(2)(d). Therefore, these tanks are not automatically exempt. However, because diesel fuel has an extremely low vapor pressure and the resulting VOC emissions are minimal, the Facility is submitting a separate Application for Determination of Insignificant Activities under NAC 445B.288(4) requesting that the 40,000-gallon tanks be formally designated as Insignificant Activities. As the tanks have not yet been approved as an Insignificant Activity, they are not included in the emissions calculations of this application.

Appendix B shows that each 40,000-gallon diesel storage tank has estimated VOC emissions of 0.067 TPY. While these emissions are small, NAC 445B.288(5) requires VOC emissions from Insignificant Activities to be included when determining a stationary source's major source status.

Although fugitive VOC emissions from the diesel tanks are expected to be negligible, the emissions from the 150-gallon, 1,240-gallon, and 400-gallon tanks were conservatively assumed to be equal to those from the 40,000-gallon tanks due to their operational connection. Detailed VOC emission calculations for both the engine tanks and the 40,000-gallon diesel storage tanks are included in Appendix B.

4.1.7 Odors (NAC 445B.22087)

NAC 445B.22087 prohibits the discharge of air contaminants that create objectionable odors. The Facility will combust ULSD in all diesel-fired engines and pipeline-quality commercial natural gas in the P1 engines and vaporizers. Both fuels have inherently low odor potential. Given the limited operating hours of the diesel engines for testing and maintenance, no objectionable odors are expected from diesel-fired units.

The P1 engines will serve as the Facility's prime power units and may operate up to 8,760 hours per year. Natural gas combustion produces very few odorous compounds, and the engines are equipped with SCR and OxCat systems that further minimize ammonia slip and other odor-forming emissions. Routine operation of these engines is therefore not anticipated to create objectionable odors, even under continuous full-year operation.

Based on the clean-burning nature of ULSD and natural gas, the use of advanced emissions controls, and compliance with manufacturer operating specifications, no additional odor control measures are required.

4.1.8 Prohibited Acts and Enforcement (NRS 445B.470)

The Facility must comply with all permit conditions, reporting requirements, and monitoring obligations under NRS 445B.470. Any falsification of data, failure to pay fees, or tampering with monitoring equipment would constitute a violation subject to significant penalties. The Facility will implement strict compliance protocols to ensure adherence to these requirements.

4.1.9 Maximum Opacity of Emissions (NAC 445B.22017)

Nevada Administrative Code (NAC) 445B.22017 limits visible emissions from stationary sources by prohibiting opacity greater than 20 percent, except for brief periods associated with startup, shutdown, or malfunction. This standard applies broadly to all stationary fuel-burning equipment at the Facility, including P1 engines, LNG vaporizers, BSE gensets, DC engines, Substation engines, and fire pump engines.

All diesel-fired engines will operate on ULSD, which significantly reduces visible particulate emissions compared to higher-sulfur fuels. The P1 engines and LNG vaporizers combust pipeline-quality commercial natural gas, which produces negligible visible particulate matter and is inherently compliant with opacity limitations.

Each diesel-fired unit is certified to meet federal Tier 2, Tier 3, or Tier 4 emission standards, which incorporate design-based particulate matter controls that further ensure opacity remains well below the NAC 445B.22017 limit. Emission calculations in Appendix B confirm that particulate emissions from all combustion units are well below PM emissions thresholds for Class I major sources, and no operational scenario is expected to produce visible emissions approaching the 20 percent opacity threshold.

Accordingly, all fuel-burning equipment at the Facility will comply with NAC 445B.22017, and no exceedances of the 20 percent opacity standard are anticipated during normal operation, testing, or maintenance.

4.1.10 Contents of Operating Permits: Required Conditions (NAC 445B.315(3)(h),(i), & (k))

The Facility will comply with NAC 445B.315(3)(h), (i), & (k) requirements by:

- Maintaining accurate records and responding promptly to NDEP information requests;
- Paying all applicable Class I permit fees; and
- Submitting compliance certifications and monitoring data per permit conditions.

4.2 Federal Regulations

4.2.1 New Source Performance Standards (40 CFR Part 60; Code Ch. 6)

Applicability of the New Source Performance Standard (NSPS) requirements for the proposed units is presented below. Some of the NSPS requirements are incorporated by reference in NAC Chapter 445B.

4.2.1.1 General Provisions (40 CFR Part 60, Subpart A)

SV RNO will comply with the applicable requirements under General Provisions of 40 CFR Part 60 Subpart A. These will include notifications, compliance testing, monitoring, recordkeeping, and reporting provisions of the rule, as applied to the unit-specific NSPS for engines as provided below.

Based on USEPA's NSPS source category listings, the LNG vaporizers are considered external combustion units, but they are not specifically regulated under any pollutant-specific NSPS subpart (e.g. Subparts Db, Dc, GG, Kb, or Kc). As a result, the vaporizers are not subject to an NSPS.

4.2.1.2 Standards of Performance for Storage Tanks (40 CFR Part 60, Subpart Kc)

NSPS 40 CFR Part 60, Subpart Kc applies to petroleum liquid storage vessels for vessels that commence construction after October 4, 2023 and are $\geq 20,000$ gallons in storage capacity. There is an exemption for storage tanks that store volatile organic

liquids with a maximum true vapor pressure that is less than 0.25 psia (1.7 kPa absolute). The 40,000-gallon diesel tanks will store an organic liquid with a maximum true vapor pressure less than 0.25 psia. Therefore, Subpart Kc will not apply.

4.2.1.3 Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60, Subpart IIII)

In NSPS 40 CFR Part 60, Subpart IIII applies to stationary CI RICE units. The proposed CI RICE units at the Facility fall into two categories: emergency and fire pump engines.

The DC engines, BSE gensets, and Substation engines are emergency stationary CI RICE model year 2007 or later with a displacement of less than 30 liters per cylinder. In accordance with § 60.4202(a)(2), the Tiered emission standards for new nonroad CI engines must be in compliance with the same rated power as described in 40 CFR Part 1039, Appendix I, shown in Table 23. The DC engines, BSE and Substation engines will be compliant with all applicable standards of NSPS Subpart IIII.

TABLE 23 NSPS IIII REQUIREMENTS FOR DC, BSE AND SUBSTATION ENGINES							
Engine	Tier	Pollutant Emission Standard (g/kW-hr)					Rule Reference
		NO _x + NMHC	NMHC	NO _x	CO	PM	
DC and BSE	4	-	0.19	0.67	3.5	0.03	§ 1039.101, Table 1
Substation	2	6.4	-	-	3.5	0.2	Appendix I to Part 1039, Table 2

The diesel fire pump engines are proposed to be model year 2009 or later and are rated at 364 kW each. Therefore, the limits shown in Table 24 apply and the fire pump engines will be compliant with all applicable standards of NSPS Subpart IIII.

TABLE 24 NSPS IIII REQUIREMENTS FOR EMERGENCY DIESEL FIRE PUMP ENGINES	
Pollutant	Emission Standard (g/kW-hr)
NMHC+NO _x	4.0
CO	3.5
PM	0.20

40 CFR §60.4202(d) and 60.4205(c), Table 4

SV RNO plans to purchase manufacturer-certified RICE units that will be in compliance with the above limitations. All of the engines will use ultra-low sulfur diesel fuel per the requirements of 40 CFR §80.510(b) and 40 CFR §60.4207.

In accordance with the operating restrictions for emergency stationary CI RICE, the Facility's diesel-fueled emergency engines—including the BSE gensets, DC engines, and Substation engines—are permitted to operate for up to 100 hours per year for the combined purposes of non-emergency testing and maintenance, and participation in EEA Level 1 and Level 2 emergency demand-response events. This operational allowance is consistent with the provisions of NSPS Subpart IIII for emergency engines and does not alter the engines' emergency classification or their applicability under the rule. The engines will continue to meet all applicable emission standards, fuel requirements, monitoring obligations, and compliance determinations specified under 40 CFR Part 60, Subpart IIII.

4.2.1.4 Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (40 CFR Part 60, Subpart JJJJ)

NSPS 40 CFR Part 60, Subpart JJJJ applies to the P1 engines. The P1 engines are lean-burn, four-stroke, SI RICE. Each P1 unit is a 20-cylinder, V-configuration, natural-gas-fired SI engine with a maximum engine power rating greater than 500 bhp and a manufacture date after July 1, 2010. Accordingly, these engines meet the applicability criteria for new SI stationary RICE under Subpart JJJJ.

The emission standards specified in Table 1 of Subpart JJJJ apply to the P1 engines, shown in Table 25. SV RNO will comply with all applicable requirements of NSPS Subpart JJJJ, including emissions limits, monitoring, testing, fuel requirements, recordkeeping, and reporting.

TABLE 25 NSPS JJJJ REQUIREMENTS FOR P1 ENGINES	
Pollutant	Emission Standard (g/hp-hr)
NO _x	2.0
CO	4.0
VOC	1.0

Subpart JJJJ of Part 60, Title 40, Table 1

4.2.2 National Emissions Standards for Hazardous Air Pollutants (40 CFR Part 63; Code Ch 7)

Applicability of the National Emissions Standards for Hazardous Air Pollutants (NESHAP) requirements for the proposed units is presented below. Some of the NESHAP requirements are incorporated by reference in NAC Chapter 445B.

Facility-wide PTE of HAPs provided in Table 22 shows the Facility will emit 37.3 TPY of a single HAP (formaldehyde) and 45.0 TPY of total combined HAPs, which exceed the major-source thresholds of 10 TPY for any individual HAP and 25 TPY for total combined HAPs established in 40 CFR §63.2. Accordingly, the Facility is considered a major source of HAPs under the federal NESHAP program.

As a major source of HAP emissions, the Facility is subject to the applicable MACT standards under 40 CFR Part 63. The Facility will meet all monitoring, testing, recordkeeping, and reporting requirements associated with major-source MACT applicability.

4.2.2.1 National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (40 CFR Part 63, Subpart ZZZZ)

40 CFR Part 63, Subpart ZZZZ applies to all stationary RICE located at both area and major sources of HAPs. As shown in Table 22, the Facility will emit more than 10 TPY of a single HAP (formaldehyde) and more than 25 TPY of total combined HAPs and therefore qualifies as a major source of HAP emissions under 40 CFR §63.2. Accordingly, all RICE units at the Facility, including P1 engines, BSE gensets, DC engines, Substation engines, and fire pump engines, are subject to the major source requirements of Subpart ZZZZ.

For the P1 engines, which are new 4SLB stationary RICE units each rated above 500 brake horsepower, the applicable requirements of Subpart ZZZZ are defined under 40 CFR §63.6600(b). This provision states that an owner or operator of a new or reconstructed 4SLB stationary RICE with a site rating of more than 500 brake horsepower located at a major source of HAP emissions must comply with the emission limitations contained in Table 2a of Subpart ZZZZ and the operating limitations contained in Table 2b. Accordingly, the P1 engines must meet these MACT emission and operational standards in addition to complying with the applicable requirements of NSPS Subpart JJJJ. Table 2a of Subpart ZZZZ states that engines must achieve a 93 percent reduction in CO emissions, or limit formaldehyde emissions at or below 14 ppmvd at 15 percent O₂. The P1 engines will meet both MACT emission limits.

The diesel-fired RICE units at the Facility—including the BSE gensets, DC engines, Substation engines, and fire pump engines—are new emergency CI engines and therefore meet the applicability criteria of §63.6590(c). Under this provision, new emergency stationary CI RICE located at major sources satisfy all Subpart ZZZZ requirements by complying with the applicable emission and operational requirements of NSPS Subpart IIII. These engines are therefore required to meet the fuel, emission, monitoring, and operational requirements of Subpart IIII, which serves as the mechanism for demonstrating full compliance with Subpart ZZZZ.

All RICE units at the Facility must also comply with the general Subpart ZZZZ requirements applicable to major sources, including the development and implementation of appropriate startup, shutdown, and malfunction provisions where required; adherence to manufacturer specified maintenance and operating procedures; performance testing where applicable under corresponding NSPS requirements; continuous parameter monitoring when required; and compliance with the recordkeeping and reporting requirements established for major source RICE units.

4.2.2.2 National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters (40 CFR Part 63, Subpart DDDDD)

40 CFR Part 63, Subpart DDDDD, applies to industrial, commercial, and institutional boilers and process heaters located at major sources of HAPs. The rule defines an affected unit as a boiler or process heater as described in §§ 63.7485 and 63.7490.

The LNG vaporizers installed at the Facility do not meet the regulatory definition of a "boiler" or "process heater" under §63.7575. Subpart DDDDD applicability requires the unit to combust fuel to either produce steam or directly heat a process stream, which is not the function of the vaporizers. The Stabilis vaporizers instead operate as fuel-conditioning equipment, heating LNG only for the purpose of converting it to pipeline-quality natural gas, not for steam production or process heating.

Because the vaporizers are not boilers and not process heaters, they do not fall within the affected source category regulated under Subpart DDDDD. Accordingly, this rule does not apply to the Facility's vaporizer units, and no requirements, emission limits, testing, monitoring, or work practice standards under Subpart DDDDD are triggered.

4.2.3 Greenhouse Gases

Per 40 CFR § 52.21(b)(49)(iv) (implemented per delegation agreement with the USEPA, for major modification purposes, GHGs are considered subject to regulation only if the project is a major source for attainment area criteria pollutants other than GHGs and the increase in emissions of GHGs is 100,000 tons of CO₂e per year or more. As noted in Section 1.2 in this application, this Facility will not be a major source of attainment criteria pollutants under NSR. Therefore, GHGs are not considered subject to regulation under the federal PSD permitting program for attainment pollutants. However, they are considered for the Title V permit, since the Facility will exceed the Title V major source threshold for at least one criteria pollutant, CO and NO_x.

5.0 PROPOSED PERMIT TERMS AND CONDITIONS

This section of the application presents proposed permit terms and conditions for the Class I OPTC for the South Valley Facility.

SV RNO is proposing the following federally enforceable emission and operational limitations for the proposed equipment P1 engines, LNG vaporizers, BSE gensets, DC engines, Substation engines, and fire pump engines to keep the Facility PTE below the NSR and PSD thresholds.

(1) Emission Limitations:

- a. The Permittee shall not cause or allow the combined NO_x emissions from the P1 engines, LNG vaporizers, BSE gensets, DC engines, Substation engines, and fire pump engines to exceed 250 tons per 12-month rolling total sum.
- b. The Permittee shall not cause or allow the combined CO emissions from the P1 engines, LNG vaporizers, BSE gensets, DC engines, Substation engines, and fire pump engines to exceed 250 tons per 12-month rolling total sum.
- c. The Permittee shall not cause or allow the combined PM₁₀ or PM_{2.5} emissions from the P1 engines, LNG vaporizers, BSE gensets, DC engines, Substation engines, and fire pump engines to exceed 250 tons per 12-month rolling total sum.
- d. The Permittee shall not cause or allow the combined VOC emissions from the P1 engines, LNG vaporizers, BSE gensets, DC engines, Substation engines, and fire pump engines to exceed 250 tons per 12-month rolling total sum.
- e. The Permittee shall not cause or allow the combined SO_x emissions from the P1 engines, LNG vaporizers, BSE gensets, DC engines, Substation engines, and fire pump engines to exceed 250 tons per 12-month rolling total sum.

(2) Operational Limitation: The Permittee shall limit the usage of natural gas in the P1 engines and LNG vaporizers to 13,250,998 MMBtu per year, per 12-month rolling total sum.

(3) Operational Limitation: The Permittee shall limit the usage of diesel fuel in the DC engines to 2,165,580 gallons per year, per 12-month rolling total sum; for non-emergency operations, including testing and maintenance activities, and emergency demand-response.

(4) Operational Limitation: The Permittee shall limit the usage of diesel fuel in the BSE gensets to 41,200 gallons per year, per 12-month rolling total sum; for non-emergency operations, including testing and maintenance activities, and emergency demand response.

(5) Operational Limitation: The Permittee shall limit the usage of diesel fuel in the Substation engines to 17,480 gallons per year, per 12-month rolling total sum; for non-emergency operations, including testing and maintenance activities, and emergency demand response.

(6) Operational Limitation: The Permittee shall limit the usage of diesel fuel in the fire pump engines to 2,520 gallons per year, per 12-month rolling total sum; for non-emergency operations, including testing and maintenance activities.

APPENDIX A
SITE LAYOUT



Autodesk Docs://RNO20/RN020-COR-SH-R25-3D-A-0001.rvt

CORGAN 

Project:

SOUTH VALLEY, RNO20
8990 USA PARKWAY McCARRAN
RENO, NV 89437

Client:

FLEET DATA CENTERS

Consultant Project Number	26009 0000
Project Code	RNO20
Design Stage	SCHEMATIC DESIGN
Model Name	RNO20-COR-SH-RZ5-3D-A-0001
Model Status	WIP
Issue	B

Design Consultant	CORGAN
Discipline	ARCHITECTS
Project Information Manager	JAKE MADDOCKS
Task Information Manager	YASIN CHAHABU

Project Leader DYLAN BUSSEY

Revit Version 2025

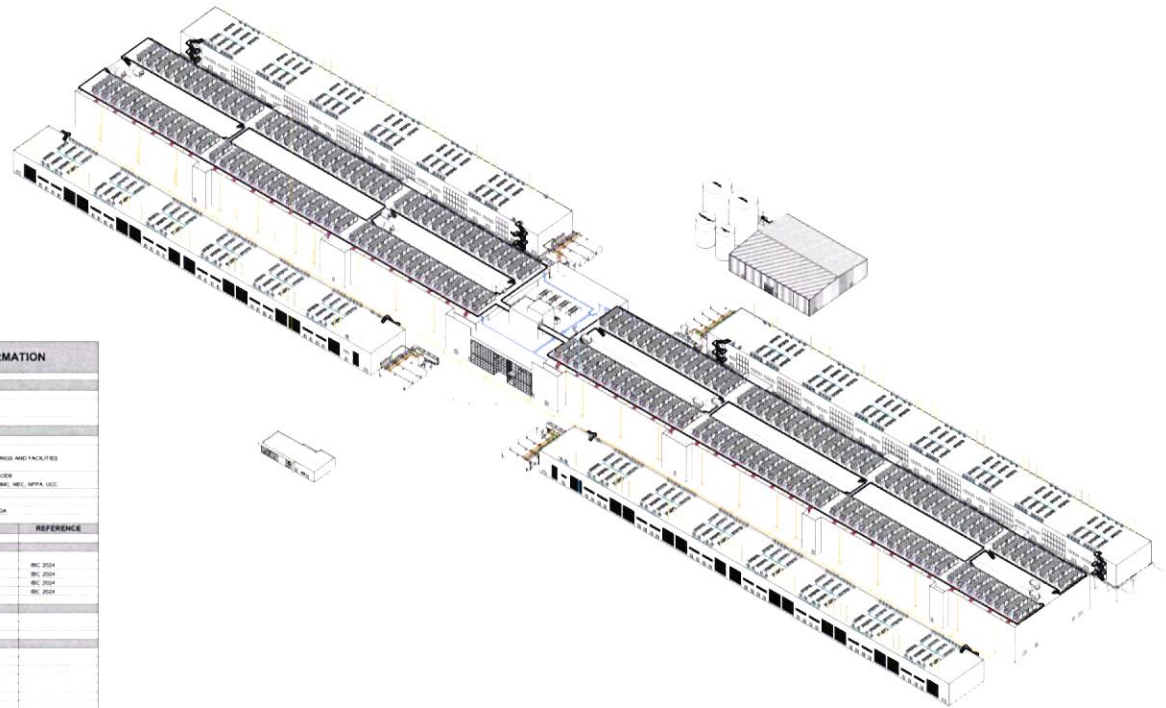
Current Revision (Model)

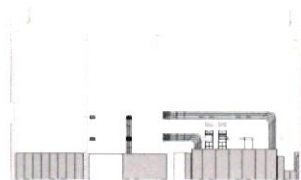
Model Revision		
Revision Number	Revision Description	Revision Date
B	SCHEMATIC DESIGN	2026-01-23

Revit Model

RNO20-COR-XX-XX-PP-A-000001

PROJECT DATA AND CODE INFORMATION									
PROJECT DATA									
PROJECT NAME		Dolph Village Phase 01							
PROJECT ADDRESS		8800 108 Parkway MacKenzie, Reno, NV 89417							
OWNER		Pearl Cove Community							
APPLICABLE CODES									
BUILDING CODE: 2018 INTERNATIONAL BUILDING CODE									
ACCESSIBILITY CODE: 2018 A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES									
ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE (NFPA 70)									
FIRE PROTECTION CODE: 2018 INTERNATIONAL FIRE CODE (NFPA 101)									
FIRE CODE: 2018 INTERNATIONAL FIRE CODE (2018, 2015, 2012, 2009, 2003, 2001, 1997, 1995, 1993, 1990, 1987, 1985, 1983, 1980, 1975, 1973, 1970, 1968, 1965, 1963, 1960, 1957, 1955, 1953, 1950, 1947, 1945, 1943, 1940, 1937, 1935, 1933, 1930, 1927, 1925, 1923, 1920, 1917, 1915, 1913, 1910, 1907, 1905, 1903, 1900, 1897, 1895, 1893, 1890, 1887, 1885, 1883, 1880, 1877, 1875, 1873, 1870, 1868, 1865, 1863, 1860, 1857, 1855, 1853, 1850, 1847, 1845, 1843, 1840, 1837, 1835, 1833, 1830, 1827, 1825, 1823, 1820, 1817, 1815, 1813, 1810, 1807, 1805, 1803, 1800, 1797, 1795, 1793, 1790, 1788, 1785, 1783, 1780, 1777, 1775, 1773, 1770, 1768, 1765, 1763, 1760, 1757, 1755, 1753, 1750, 1747, 1745, 1743, 1740, 1737, 1735, 1733, 1730, 1727, 1725, 1723, 1720, 1717, 1715, 1713, 1710, 1707, 1705, 1703, 1700, 1697, 1695, 1693, 1690, 1687, 1685, 1683, 1680, 1677, 1675, 1673, 1670, 1668, 1665, 1663, 1660, 1657, 1655, 1653, 1650, 1647, 1645, 1643, 1640, 1637, 1635, 1633, 1630, 1627, 1625, 1623, 1620, 1617, 1615, 1613, 1610, 1607, 1605, 1603, 1600, 1597, 1595, 1593, 1590, 1587, 1585, 1583, 1580, 1577, 1575, 1573, 1570, 1568, 1565, 1563, 1560, 1557, 1555, 1553, 1550, 1547, 1545, 1543, 1540, 1537, 1535, 1533, 1530, 1527, 1525, 1523, 1520, 1517, 1515, 1513, 1510, 1507, 1505, 1503, 1500, 1497, 1495, 1493, 1490, 1487, 1485, 1483, 1480, 1477, 1475, 1473, 1470, 1468, 1465, 1463, 1460, 1457, 1455, 1453, 1450, 1447, 1445, 1443, 1440, 1437, 1435, 1433, 1430, 1427, 1425, 1423, 1420, 1417, 1415, 1413, 1410, 1407, 1405, 1403, 1400, 1397, 1395, 1393, 1390, 1387, 1385, 1383, 1380, 1377, 1375, 1373, 1370, 1368, 1365, 1363, 1360, 1357, 1355, 1353, 1350, 1347, 1345, 1343, 1340, 1337, 1335, 1333, 1330, 1327, 1325, 1323, 1320, 1317, 1315, 1313, 1310, 1307, 1305, 1303, 1300, 1297, 1295, 1293, 1290, 1287, 1285, 1283, 1280, 1277, 1275, 1273, 1270, 1268, 1265, 1263, 1260, 1257, 1255, 1253, 1250, 1247, 1245, 1243, 1240, 1237, 1235, 1233, 1230, 1227, 1225, 1223, 1220, 1217, 1215, 1213, 1210, 1207, 1205, 1203, 1200, 1197, 1195, 1193, 1190, 1187, 1185, 1183, 1180, 1177, 1175, 1173, 1170, 1168, 1165, 1163, 1160, 1157, 1155, 1153, 1150, 1147, 1145, 1143, 1140, 1137, 1135, 1133, 1130, 1127, 1125, 1123, 1120, 1117, 1115, 1113, 1110, 1107, 1105, 1103, 1100, 1097, 1095, 1093, 1090, 1087, 1085, 1083, 1080, 1077, 1075, 1073, 1070, 1068, 1065, 1063, 1060, 1057, 1055, 1053, 1050, 1047, 1045, 1043, 1040, 1037, 1035, 1033, 1030, 1027, 1025, 1023, 1020, 1017, 1015, 1013, 1010, 1007, 1005, 1003, 1000, 997, 995, 993, 990, 987, 985, 983, 980, 977, 975, 973, 970, 968, 965, 963, 960, 957, 955, 953, 950, 947, 945, 943, 940, 937, 935, 933, 930, 927, 925, 923, 920, 917, 915, 913, 910, 907, 905, 903, 900, 897, 895, 893, 890, 887, 885, 883, 880, 877, 875, 873, 870, 868, 865, 863, 860, 857, 855, 853, 850, 847, 845, 843, 840, 837, 835, 833, 830, 827, 825, 823, 820, 817, 815, 813, 810, 807, 805, 803, 800, 797, 795, 793, 790, 788, 785, 783, 780, 777, 775, 773, 770, 768, 765, 763, 760, 757, 755, 753, 750, 747, 745, 743, 740, 737, 735, 733, 730, 727, 725, 723, 720, 717, 715, 713, 710, 707, 705, 703, 700, 697, 695, 693, 690, 687, 685, 683, 680, 677, 675, 673, 670, 668, 665, 663, 660, 657, 655, 653, 650, 647, 645, 643, 640, 637, 635, 633, 630, 627, 625, 623, 620, 617, 615, 613, 610, 607, 605, 603, 600, 597, 595, 593, 590, 587, 585, 583, 580, 577, 575, 573, 570, 568, 565, 563, 560, 557, 555, 553, 550, 547, 545, 543, 540, 537, 535, 533, 530, 527, 525, 523, 520, 517, 515, 513, 510, 507, 505, 503, 500, 497, 495, 493, 490, 487, 485, 483, 480, 477, 475, 473, 470, 468, 465, 463, 460, 457, 455, 453, 450, 447, 445, 443, 440, 437, 435, 433, 430, 427, 425, 423, 420, 417, 415, 413, 410, 407, 405, 403, 400, 397, 395, 393, 390, 387, 385, 383, 380, 377, 375, 373, 370, 368, 365, 363, 360, 357, 355, 353, 3									





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www.phase-x.com

NOTES

The Drawings provided herein are for informational purposes only and do not represent a warranty of service of any nature. Official record documents and any associated sealings, exhibits and/or inclusions shall take precedence over these files. It shall be the recipient's sole responsibility to verify the accuracy and verifiability of the information on these drawings for any purpose.

Signature

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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File	Project	Date	Page
SCHEMATIC DESIGN			
PROJECT DATA CENTER 3200 CHERRY CREEK & IMPROV SLATE AND DRIVER CIO N200			
THE SOUTH VALLEY (RINO) 8888 USA PARKWAY McCLANNAN (RINO) NV 89417			

Topic	Code	Page	Page
00-000	0.0	0.0	0.0
00-000	0.0	0.0	0.0

FNC020-PAR-D1-XX-DR-E-603006

APPENDIX B

POTENTIAL-TO-EMIT CALCULATIONS

South Valley Technology Center

Total GHG Calculations

February 24, 2026

Hourly CO₂e

Pollutant	GWP Factor	Hourly Rate All P1 Prime Engines (lb/hr)	Hourly Rate All Vaporizers (lb/hr)	Hourly Rate All Black Start Engines (lb/hr)	Hourly Rate All DC Engines (lb/hr)	Hourly Rate All Substation Engines (lb/hr)	Hourly Rate All Fire Pump Engines (lb/hr)	Total Hourly Rate (lb/hr)	CO ₂ e (lb/hr)
CO ₂	1	1.41E+05	9.36E+00	9.34E+03	4.91E+05	3.95E+03	1.42E+03	6.46E+05	6.46E+05
CH ₄	28	2.82E+00	2.29E-01	3.74E-01	1.97E+01	1.58E-01	5.71E-02	2.33E+01	6.53E+02
N ₂ O	265	2.82E-01	2.29E-02	7.49E-02	3.94E+00	3.17E-02	1.14E-02	4.36E+00	1.16E+03

CO₂e: 648,281

Annual CO₂e

Pollutant	GWP Factor	Annual Rate All P1 Prime Engines (TPY)	Annual Rate All Vaporizers (TPY)	Annual Rate All Black Start Engines (TPY)	Annual Rate All DC Engines (TPY)	Annual Rate All Substation Engines (TPY)	Annual Rate All Fire Pump Engines (TPY)	Total Annual Rate (TPY)	CO ₂ e (TPY)
CO ₂	1	6.17E+05	4.10E+01	4.67E+02	2.45E+04	1.98E+02	2.83E+01	6.42E+05	6.42E+05
CH ₄	28	1.24E+01	1.00E+00	1.87E-02	9.84E-01	7.92E-03	1.14E-03	1.44E+01	4.03E+02
N ₂ O	265	1.24E+00	1.00E-01	3.74E-03	1.97E-01	1.58E-03	2.28E-04	1.54E+00	4.08E+02

CO₂e: 643,087

South Valley Technology Center

Prime Power (P1) Engines

Criteria Pollutants and CO₂

February 24, 2026

Model: Jenbacher J420									
Number of Generators:		90							
Fuel:		NG		Total Engine Rated w/Backup Power (MW):		144		Nominal	
Hours/yr:		8,760		Target (MW):		125			
Operating Factor:		100%							
Engine Power (kWh):		1,600		Max Rate		MMBtu/hr:		14.2	
Potential Engine Power (HP):		2,146		Max Rate		Total MMBtu/hr:		1,281	
Total Engine Power (kWh):		144,000		Max Rate		MMBtu/yr/all engines:		11,218,144	
Total Engine Power (HP):		193,140		Max Rate		Ratio for Annual:		0.945	
Airflow (lb/hr per engine):		18,415		Max Rate					
Exhaust Temperature (F):		819							

Pollutant	Emission Factor	EF Units	Emission Factor Source	Uncontrolled Estimated Emissions per Engine @ Full Load (lb/hr)	Uncontrolled Estimated Emissions per Engine @ Full Load (TPY)	Fuel Based Emission Factor (lbs/MMBTU)	Pollutant Control (%)	Controlled Estimated Emissions @ Full Load (g/hp-hr)	Controlled Estimated Emissions @ Full Load (lb/hr)	Fuel Based Emission Factor (lbs/MMBTU)	Controlled Annual Emissions @ Full Load per Engine (TPY)	Facility Controlled Estimated Emissions - Derated (TPY)
NO _x	0.81	g/hp-hr	Vendor	3.83	16.8	0.269	93.8%	0.0502	0.238	0.0167	1.04	88.5
CO	2.00	g/hp-hr	Vendor	9.46	41.4	0.66	97.4%	0.0520	0.246	0.0173	1.08	91.6
PM _{10/2.5}	0.01	g/hp-hr	Vendor	0.0473	0.21	0.0033	0.0%	0.0100	0.0473	0.00332	0.207	17.6
VOC	0.10	g/hp-hr	Vendor	0.473	2.07	0.0332	80.0%	0.0200	0.0946	0.0066	0.414	35.2
SO ₂	0.015	g/hp-hr	Vendor	0.071	0.311	0.0050	0.0%	0.0150	0.0710	0.0050	0.311	26.4
CO ₂	1.10E+02	lb/MMBTU	AP-42 3.2	1,565	6,856	110	0.0%	110	1,565	110	6,856	582,815

South Valley Technology Center

Prime Power (P1) Engines

HAP Emissions

February 24, 2026

Model: Jenbacher J420
 Number of Generators: 90 MMBtu/hr: 14.2
 Fuel: NG Total MMBtu/hr: 1,281
 Hours/yr: 8760
 Operating Factor: 100%
 Engine Power (kWh): 1,600
 Max Potential Engine Power (HP): 2,146
 Total Engine Power (kWh): 144,000
 Total Engine Power (HP): 193,140
 Exhaust Airflow (CFM): 18,415
 Exhaust Temperature (F): 819

Hazardous Air Pollutants	Uncontrolled Emission Factor	Emission Factor Units	Pollutant Control (%)	Controlled Emissions			
				Emissions Per Engine (lb/hr)	Emissions All Engines (lb/hr)	Emissions Per Engine (TPY)	Emissions All Engines (TPY)
1,1,2,2-Tetrachloroethane	4.00E-05	lb/MMBtu	80%	1.14E-04	1.02E-02	4.99E-04	4.49E-02
1,1,2-Trichloroethane	3.18E-05	lb/MMBtu	80%	9.05E-05	8.14E-03	3.96E-04	3.57E-02
1,3-Butadiene	2.67E-04	lb/MMBtu	80%	7.60E-04	6.84E-02	3.33E-03	3.00E-01
1,3-Dichloropropene	2.64E-05	lb/MMBtu	80%	7.51E-05	6.76E-03	3.29E-04	2.96E-02
2,2,4-Trimethylpentane	2.50E-04	lb/MMBtu	80%	7.11E-04	6.40E-02	3.12E-03	2.80E-01
2-Methylnaphthalene	3.32E-05	lb/MMBtu	80%	9.45E-05	8.50E-03	4.14E-04	3.72E-02
Acenaphthene	1.25E-06	lb/MMBtu	80%	3.56E-06	3.20E-04	1.56E-05	1.40E-03
Acenaphthylene	5.53E-06	lb/MMBtu	80%	1.57E-05	1.42E-03	6.89E-05	6.20E-03
Benzene	4.40E-04	lb/MMBtu	80%	1.25E-03	1.13E-01	5.48E-03	4.94E-01
Benzo(b)fluoranthene	1.66E-07	lb/MMBtu	80%	4.72E-07	4.25E-05	2.07E-06	1.86E-04
Benzo(e)pyrene	4.15E-07	lb/MMBtu	80%	1.18E-06	1.06E-04	5.17E-06	4.66E-04
Benzo(g,h,i)perylene	4.14E-07	lb/MMBtu	80%	1.18E-06	1.06E-04	5.16E-06	4.64E-04
Biphenyl	2.12E-04	lb/MMBtu	80%	6.03E-04	5.43E-02	2.64E-03	2.38E-01
Carbon Tetrachloride	3.67E-05	lb/MMBtu	80%	1.04E-04	9.40E-03	4.57E-04	4.12E-02
Chlorobenzene	3.04E-05	lb/MMBtu	80%	8.65E-05	7.79E-03	3.79E-04	3.41E-02
Chloroform	2.85E-05	lb/MMBtu	80%	8.11E-05	7.30E-03	3.55E-04	3.20E-02
Chrysene	6.93E-07	lb/MMBtu	80%	1.97E-06	1.77E-04	8.64E-06	7.77E-04
Ethylbenzene	3.97E-05	lb/MMBtu	80%	1.13E-04	1.02E-02	4.95E-04	4.45E-02
Ethylene Dibromide	4.43E-05	lb/MMBtu	80%	1.26E-04	1.13E-02	5.52E-04	4.97E-02
Fluoranthene	1.11E-06	lb/MMBtu	80%	3.16E-06	2.84E-04	1.38E-05	1.25E-03
Fluorene	5.67E-06	lb/MMBtu	80%	1.61E-05	1.45E-03	7.07E-05	6.36E-03
Formaldehyde	2.00E-01	g/hp-hr	90%	9.46E-02	8.52E+00	4.14E-01	3.73E+01
Methanol	2.50E-03	lb/MMBtu	80%	7.11E-03	6.40E-01	3.12E-02	2.80E+00
Methylene Chloride	2.00E-05	lb/MMBtu	80%	5.69E-05	5.12E-03	2.49E-04	2.24E-02
n-Hexane	1.11E-03	lb/MMBtu	80%	3.16E-03	2.84E-01	1.38E-02	1.25E+00
Naphthalene	7.44E-05	lb/MMBtu	80%	2.12E-04	1.91E-02	9.27E-04	8.35E-02
PAH	2.69E-05	lb/MMBtu	80%	7.66E-05	6.89E-03	3.35E-04	3.02E-02
Phenanthrene	1.04E-05	lb/MMBtu	80%	2.96E-05	2.66E-03	1.30E-04	1.17E-02
Phenol	2.40E-05	lb/MMBtu	80%	6.83E-05	6.15E-03	2.99E-04	2.69E-02
Pyrene	1.36E-06	lb/MMBtu	80%	3.87E-06	3.48E-04	1.70E-05	1.53E-03
Styrene	2.36E-05	lb/MMBtu	80%	6.72E-05	6.04E-03	2.94E-04	2.65E-02
Perchloroethylene	2.48E-06	lb/MMBtu	80%	7.06E-06	6.35E-04	3.09E-05	2.78E-03
Toluene	4.08E-04	lb/MMBtu	80%	1.16E-03	1.04E-01	5.09E-03	4.58E-01
Vinyl Chloride	1.49E-05	lb/MMBtu	80%	4.24E-05	3.82E-03	1.86E-04	1.67E-02
Xylenes	1.84E-04	lb/MMBtu	80%	5.24E-04	4.71E-02	2.29E-03	2.06E-01
TOTAL HAPs				0.11	10.0	0.49	43.9

Emission factors for all HAPs except formaldehyde are for natural gas-fired Reciprocating Engines, 4-stroke lean burn, AP-42, Chapter 3, Section 2, Table 3.2-2 (10/24). Formaldehyde emission factor and control efficiency are from the vendor's specification.

South Valley Technology Center

Vaporizers

Criteria Pollutants and CO₂

February 24, 2026

Model:	Stabilis Dual Burner	MMBtu/hr per Burner:	26
Number of Vaporizers:	2	MMBtu/hr per Vaporizer:	52
Number of Burners per Vaporizer:	2	MMscf/hr per Burner:	0.0255
Fuel:	LNG	MMscf/hr per Vaporizer:	0.0510
Hours/yr:	8,760	MMBtu/yr/all Vaporizers:	911,040
Operating Factor:	100%	(Based on fuel use) MMscf/yr/all Vaporizers:	893

Pollutant	Emission Factor	EF Units	Emission Factor Source	Uncontrolled Estimated Emissions per Vaporizer (lb/hr)	Uncontrolled Estimated Emissions per Vaporizer (TPY)	Pollutant Control (%)	Controlled Estimated Emissions per Vaporizer (lb/hr)	Controlled Annual Estimated Emissions per Vaporizer (TPY)	Facility Controlled Estimated Emissions (TPY)
NO _x	0.037	lb/MMBtu	Vendor	1.92	8.43	0.0%	1.92	8.43	16.9
CO	0.037	lb/MMBtu	Vendor	1.92	8.43	0.0%	1.92	8.43	16.9
PM _{10/2.5}	0.0075	lb/MMBtu	Vendor	0.39	1.71	0.0%	0.39	1.71	3.42
VOC	0.0054	lb/MMBtu	Vendor	0.28	1.23	0.0%	0.28	1.23	2.46
SO ₂	0.0006	lb/MMBtu	Vendor	0.03	0.14	0.0%	0.03	0.14	0.27
CO ₂	0.090	lb/MMBtu	Vendor	4.68	20.5	0.0%	4.68	20.5	41.0

South Valley Technology Center

Vaporizers

HAP Emissions

February 24, 2026

Model: Stabilis Dual Burner
 Number of Vaporizers: 2
 Number of Burners per Vaporizer: 2
 Fuel: LNG
 Hours/yr: 8760
 MMBtu/hr per Burner: 26
 MMBtu/hr per Vaporizer: 52
 MMscf/hr per Burner: 0.0255
 MMscf/hr per Vaporizer: 0.0510

Hazardous Air Pollutants	Uncontrolled Emission Factor (lb/MMscf)	Pollutant Control (%)	Controlled Emissions			
			Emissions Per Vaporizer (lb/hr)	Emissions All Vaporizers (lb/hr)	Emissions Per Vaporizer (TPY)	Emissions All Vaporizers (TPY)
2-Methylnaphthalene	2.40E-05	0%	1.22E-06	2.45E-06	5.36E-06	1.07E-05
3-Methylcholanthrene	1.80E-06	0%	9.18E-08	1.84E-07	4.02E-07	8.04E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	0%	8.16E-07	1.63E-06	3.57E-06	7.15E-06
Acenaphthene	1.80E-06	0%	9.18E-08	1.84E-07	4.02E-07	8.04E-07
Acenaphthylene	1.80E-06	0%	9.18E-08	1.84E-07	4.02E-07	8.04E-07
Anthracene	2.40E-06	0%	1.22E-07	2.45E-07	5.36E-07	1.07E-06
Benz(a)anthracene	1.80E-06	0%	9.18E-08	1.84E-07	4.02E-07	8.04E-07
Benzene	2.10E-03	0%	1.07E-04	2.14E-04	4.69E-04	9.38E-04
Benzo(a)pyrene	1.20E-06	0%	6.12E-08	1.22E-07	2.68E-07	5.36E-07
Benzo(b)fluoranthene	1.80E-06	0%	9.18E-08	1.84E-07	4.02E-07	8.04E-07
Chrysene	1.80E-06	0%	9.18E-08	1.84E-07	4.02E-07	8.04E-07
Dibenzo(a,h)anthracene	1.20E-06	0%	6.12E-08	1.22E-07	2.68E-07	5.36E-07
Dichlorobenzene	1.20E-03	0%	6.12E-05	1.22E-04	2.68E-04	5.36E-04
Fluoranthene	3.00E-06	0%	1.53E-07	3.06E-07	6.70E-07	1.34E-06
Fluorene	2.80E-06	0%	1.43E-07	2.85E-07	6.25E-07	1.25E-06
Formaldehyde	7.50E-02	0%	3.82E-03	7.65E-03	1.67E-02	3.35E-02
Indeno(1,2,3-c,d)pyrene	1.80E-06	0%	9.18E-08	1.84E-07	4.02E-07	8.04E-07
n-Hexane	1.80E+00	0%	9.18E-02	1.84E-01	4.02E-01	8.04E-01
Naphthalene	6.10E-04	0%	3.11E-05	6.22E-05	1.36E-04	2.72E-04
Phenanthrene	1.70E-05	0%	8.67E-07	1.73E-06	3.80E-06	7.59E-06
Pyrene	5.00E-06	0%	2.55E-07	5.10E-07	1.12E-06	2.23E-06
Toluene	3.40E-03	0%	1.73E-04	3.47E-04	7.59E-04	1.52E-03
Arsenic	2.00E-04	0%	1.02E-05	2.04E-05	4.47E-05	8.93E-05
Beryllium	1.20E-05	0%	6.12E-07	1.22E-06	2.68E-06	5.36E-06
Cadmium	1.10E-03	0%	5.61E-05	1.12E-04	2.46E-04	4.91E-04
Chromium	1.40E-03	0%	7.14E-05	1.43E-04	3.13E-04	6.25E-04
Cobalt	8.40E-05	0%	4.28E-06	8.56E-06	1.88E-05	3.75E-05
Lead	5.00E-04	0%	2.55E-05	5.10E-05	1.12E-04	2.23E-04
Manganese	3.80E-04	0%	1.94E-05	3.87E-05	8.49E-05	1.70E-04
Mercury	2.60E-04	0%	1.33E-05	2.65E-05	5.81E-05	1.16E-04
Nickel	2.10E-03	0%	1.07E-04	2.14E-04	4.69E-04	9.38E-04
Selenium	2.40E-05	0%	1.22E-06	2.45E-06	5.36E-06	1.07E-05
TOTAL HAPs			0.10	0.19	0.42	0.84

Emission factors for all HAPs are for natural gas combustion, AP-42, Chapter 1, Section 4, Table 1.4-3 and 1.4-4. Emission factor for lead from Table 1.4-2 (9/20).

South Valley Technology Center

Black Start Engine Gensets

Criteria Pollutants and CO₂

February 24, 2026

Model: Volvo Penta T4 TWD1683GE			
Number of Gensets:	4		
Number of Engines:	8		
Fuel:	Diesel	5.48	Total Engine Rated Backup Power (MW)
Hours/yr:	100		
Operating Factor:	100%	51.50	100% Load Fuel Consumption per Engine (Gal/hr/engine)
Engine Power (kWh):	685	5,150	Fuel Consumption (Gal/yr/engine)
Maximum Potential Engine Power (HP):	932	41,200	Total Fuel Consumption (gal/yr)
Total Engine Power (kWh):	5,480	7.075	Fuel Consumption (MMBtu/hr)
Total Engine Power (HP):	7,456		
Exhaust Airflow (CFM):	3,991		
Exhaust Temperature (F):	810		

Pollutant	Emission Factor	EF Units	Emission Factor Source	Uncontrolled Estimated Emissions @ Full Load per Engine (lb/hr)	Uncontrolled Estimated Emissions @ Full Load per Genset (lb/hr)	Uncontrolled Estimated Emissions per Engine @ Full Load (TPY)	Uncontrolled Estimated Emissions per Genset @ Full Load (TPY)	Fuel Based Emission Factor (lbs/gal)	Pollutant Control (%)	Controlled Emission Factor	Controlled Estimated Emissions @ Full Load per Engine (lb/hr)	Controlled Estimated Emissions @ Full Load per Genset (lb/hr)	Controlled Annual Estimated Emissions @ Full Load per Engine (TPY)	Controlled Annual Estimated Emissions @ Full Load per Genset (TPY)	Facility Controlled Estimated Emissions (TPY)
NO _x	0.4	g/kWh	Vendor	0.604	1.208	0.0302	0.060	1.17E-02	0	0.400	0.60	1.21	0.0302	0.0604	0.24
CO	0.066	g/kWh	Vendor	0.0997	0.199	0.0050	0.010	1.94E-03	0	0.066	0.10	0.20	0.0050	0.0100	0.04
PM _{10/2.5}	0.0137	g/kWh	Vendor	0.0207	0.041	0.0010	0.0021	4.02E-04	0	0.0137	0.02	0.04	0.0010	0.0021	0.01
VOC	0.013	g/kWh	Vendor	0.0196	0.039	0.0010	0.0020	3.81E-04	0	0.013	0.02	0.04	0.0010	0.0020	0.01
SO _x	0.0015	lb/MMBtu	AP-42 3.4	0.0107	0.021	0.0005	0.0011	2.08E-04	0	0.00152	0.0107	0.02	0.0005	0.0011	0.00
CO ₂	165	lb/MMBtu	AP-42 3.4	1,167	2,335	58.4	117	2.27E+01	0	165	1,167	2,335	58.4	117	467

South Valley Technology Center

Black Start Engine Gensets

HAP Emissions

February 24, 2026

Model:	Volvo Penta T4 TWD1683GE		
Number of Gensets:	4		
Number of Engines:	8		
Fuel:	Diesel	5.48	Engine Rated Backup Power (MW)
Hours/yr:	100		
Operating Factor:	100%	51.5	100% Load Fuel Consumption (gal/hr)
Engine Power (kWh):	685	5,150	Fuel Consumption (gal/yr/engine)
Max Potential Engine Power (HP):	932	41,200	Total Fuel Consumption (gal/yr)
Total Engine Power (kWh):	5,480	7.08	Fuel Consumption (MMBtu/hr)
Total Engine Power (HP):	7,456		
Exhaust Airflow (CFM):	3,991		
Exhaust Temperature (F):	810		

Hazardous Air Pollutants	Uncontrolled Emission Factor (lb/MMBtu)	Controlled Emissions			
		Emissions Per Genset (lb/hr)	Emissions All Gensets (lb/hr)	Emissions Per Genset (TPY)	Emissions All Gensets (TPY)
Benzene	7.76E-04	1.10E-02	4.39E-02	5.49E-04	2.20E-03
Toluene	2.81E-04	3.98E-03	1.59E-02	1.99E-04	7.95E-04
Xylenes	1.93E-04	2.73E-03	1.09E-02	1.37E-04	5.46E-04
Formaldehyde	7.89E-05	1.12E-03	4.47E-03	5.58E-05	2.23E-04
Acetaldehyde	2.52E-05	3.57E-04	1.43E-03	1.78E-05	7.13E-05
Acrolein	7.88E-06	1.12E-04	4.46E-04	5.58E-06	2.23E-05
Naphthalene	1.30E-04	1.84E-03	7.36E-03	9.20E-05	3.68E-04
Total PAH	2.12E-04	3.00E-03	1.20E-02	1.50E-04	6.00E-04
TOTAL HAPs		0.024	0.10	0.0012	0.0048

Emission factors for large uncontrolled diesel-fueled engines, AP-42, Chapter 3, Section 4, Table 3.4-3 and 3.4-4 (4/25).

South Valley Technology Center

Data Center Engines

Criteria Pollutants and CO₂

February 24, 2026

Model: Caterpillar 3516E (EM4718-02)
 Number of Generators: 106
 Fuel: Diesel 318 Engine Rated Backup Power (MW)
 Hours/yr: 100
 Operating Factor: 100% 204.3 100% Load Fuel Consumption (gal/hr)
 Engine Power (kVA): 3,750 20,430 Fuel Consumption (gal/yr/engine)
 Engine Power (kWh): 3,000 2,165,580 Total Fuel Consumption (gal/yr)
 Maximum Potential Engine Power (HP): 4,393 28.07 Fuel Consumption (MMBtu/hr)
 Total Engine Power (kWh): 318,000
 Total Engine Power (HP): 465,658
 Exhaust Airflow (CFM): 22,806
 Exhaust Temperature (F): 902

Pollutant	Emission Factor	EF Units	Emission Factor Source	Uncontrolled Estimated Emissions @ Full Load (lb/hr)	Uncontrolled Estimated Emissions per Engine @ Full Load (TPY)	Fuel Based Emission Factor (lbs/gal)	Pollutant Control (%)	Controlled Estimated Emissions Factor @ Full Load	Controlled Estimated Emissions @ Full Load (lb/hr)	Controlled Annual Estimated Emissions per Engine @ Full Load (TPY)	Facility Controlled Estimated Emissions (TPY)
NO _x	6.76	g/hp-hr	Vendor	65.5	3.27	3.20E-01	95	0.34	3.27	0.16	17.3
CO	1.20	g/hp-hr	Vendor	11.6	0.58	5.69E-02	89	0.13	1.28	0.06	6.78
PM _{10/2.5}	0.06	g/hp-hr	Vendor	0.581	0.03	2.84E-03	66.7	0.020	0.19	0.01	1.03
VOC	0.06	g/hp-hr	Vendor	0.581	0.03	2.84E-03	0	0.06	0.58	0.03	3.08
SO ₂	0.0015	lb/MMBtu	AP-42 3.4	0.0425	0.00	2.08E-04	0	0.002	0.04	0.002	0.23
CO ₂	165	lb/MMBtu	AP-42 3.4	4,631	232	2.27E+01	0	165	4,631	232	24,545

South Valley Technology Center

Data Center Engines

HAP Emissions

February 24, 2026

Model: Caterpillar 3516E (EM4718-02)

Number of Generators:	106		
Fuel:	Diesel	318	Engine Rated Backup Power (MW)
Hours/yr:	100		
Operating Factor:	100%	204.3	100% Load Fuel Consumption (gal/hr)
Engine Power (kVA):	3,750	20,430	Fuel Consumption (gal/yr/engine)
Engine Power (kWh):	3,000	2,165,580	Total Fuel Consumption (gal/yr)
Max Potential Engine Power (HP):	4,393	28.07	Fuel Consumption (MMBtu/hr)
Total Engine Power (kWh):	318,000		
Total Engine Power (HP):	465,658		
Exhaust Airflow (CFM):	22,806		
Exhaust Temperature (F):	902		

Hazardous Air Pollutants	Uncontrolled Emission Factor (lb/MMBtu)	Controlled Emissions			
		Emissions Per Engine (lb/hr)	Emissions All Engines (lb/hr)	Emissions Per Engine (TPY)	Emissions All Engines (TPY)
Benzene	7.76E-04	2.18E-02	2.31E+00	1.09E-03	1.15E-01
Toluene	2.81E-04	7.89E-03	8.36E-01	3.94E-04	4.18E-02
Xylenes	1.93E-04	5.42E-03	5.74E-01	2.71E-04	2.87E-02
Formaldehyde	7.89E-05	2.21E-03	2.35E-01	1.11E-04	1.17E-02
Acetaldehyde	2.52E-05	7.07E-04	7.50E-02	3.54E-05	3.75E-03
Acrolein	7.88E-06	2.21E-04	2.34E-02	1.11E-05	1.17E-03
Naphthalene	1.30E-04	3.65E-03	3.87E-01	1.82E-04	1.93E-02
Total PAH	2.12E-04	5.95E-03	6.31E-01	2.98E-04	3.15E-02
TOTAL HAPs		0.05	5.07	0.0024	0.25

Emission factors for large uncontrolled diesel-fueled engines, AP-42, Chapter 3, Section 4, Table 3.4-3 and 3.4-4 (4/25).

South Valley Technology Center

Substation Engines

Criteria Pollutants and CO₂

February 24, 2026

Model:	Caterpillar C32	1250 kW		
Number of Generators:	2			
Fuel:	Diesel	2.5	Engine Rated Backup Power (MW)	
Hours/yr:	100			
Operating Factor:	100%	87.4	100% Load Fuel Consumption (gal/hr)	
Engine Power (kWh):	1,250	8,740	Fuel Consumption (gal/yr/engine)	
Maximum Potential Engine Power (HP):	1,676	17,480	Total Fuel Consumption (gal/yr)	
Total Engine Power (kWh):	2,500	12.0	Fuel Consumption (MMBtu/hr)	
Total Engine Power (HP):	3,353			
Exhaust Airflow (CFM):	10,005.8			
Exhaust Temperature (F):	807			

Pollutant	Emission Factor	EF Units	Emission Factor Source	Uncontrolled Estimated Emissions @ Full Load (lb/hr)	Fuel Based Emission Factor (lbs/gal)	Pollutant Control (%)	Controlled Estimated Emissions @ Full Load (lb/hr)	Controlled Annual Estimated Emissions per Engine @ Full Load (TPY)	Facility Controlled Estimated Emissions (TPY)
NO _x	6.2	g/hp-hr	Vendor	22.9	2.62E-01	0	22.9	1.15	2.29
CO	0.21	g/hp-hr	Vendor	0.776	8.88E-03	0	0.776	0.0388	0.0776
PM _{10/2.5}	0.02	g/hp-hr	Vendor	0.0739	8.46E-04	0	0.0739	0.00370	0.0074
VOC	0.1	g/hp-hr	Vendor	0.370	4.23E-03	0	0.370	0.0185	0.0370
SO ₂	0.0015	lb/MMBtu	AP-42 3.4	0.0181	2.08E-04	0	0.0181	0.000907	0.0018
CO ₂	165	lb/MMBtu	AP-42 3.4	1,976	2.26E+01	0	1,976	98.8	198

South Valley Technology Center

Substation Engines

HAP Emissions

February 24, 2026

Model:	Caterpillar C32	1250 kW	
Number of Generators:	2		
Fuel:	Diesel	2.5	Engine Rated Backup Power (MW)
Hours/yr:	100		
Operating Factor:	100%	87.4	100% Load Fuel Consumption (gal/hr)
Engine Power (kWh):	1,250	8,740	Fuel Consumption (gal/yr/engine)
Max Potential Engine Power (HP):	1,676	17,480	Total Fuel Consumption (gal/yr)
Total Engine Power (kWh):	2,500	11.97	Fuel Consumption (MMBtu/hr)
Total Engine Power (HP):	3,353		
Exhaust Airflow (CFM):	10,005.8		
Exhaust Temperature (F):	806.6		

Hazardous Air Pollutants	Uncontrolled Emission Factor (lb/MMBtu)	Controlled Emissions			
		Emissions Per Engine (lb/hr)	Emissions All Engines (lb/hr)	Emissions Per Engine (TPY)	Emissions All Engines (TPY)
Benzene	7.76E-04	9.29E-03	1.86E-02	4.65E-04	9.29E-04
Toluene	2.81E-04	3.36E-03	6.73E-03	1.68E-04	3.36E-04
Xylenes	1.93E-04	2.31E-03	4.62E-03	1.16E-04	2.31E-04
Formaldehyde	7.89E-05	9.45E-04	1.89E-03	4.72E-05	9.45E-05
Acetaldehyde	2.52E-05	3.02E-04	6.03E-04	1.51E-05	3.02E-05
Acrolein	7.88E-06	9.44E-05	1.89E-04	4.72E-06	9.44E-06
Naphthalene	1.30E-04	1.56E-03	3.11E-03	7.78E-05	1.56E-04
Total PAH	2.12E-04	2.54E-03	5.08E-03	1.27E-04	2.54E-04
TOTAL HAPs		0.020	0.041	0.0010	0.0020

Emission factors for large uncontrolled diesel-fueled engines, AP-42, Chapter 3, Section 4, Table 3.4-3 and 3.4-4 (4/25).

South Valley Technology Center

Fire Pump Engines

Criteria Pollutants and CO₂

February 24, 2026

Model: Clarke C18H0-UFAD12			
Number of Engines:	2	31.5	100% Load Fuel Consumption (gal/hr)
Fuel:	Diesel	1,260	Fuel Consumption (gal/yr/engine)
Hours/yr:	40	2,520	Total Fuel Consumption (gal/yr)
Operating Factor:	100%	4.32	Fuel Consumption (MMBtu/hr/engine)
Fuel:	364		
Total Engine Power (kWh):	728		
Total Engine Power (HP):	488		
Exhaust Airflow (CFM):	3,830		
Exhaust Temperature (F):	953		

Pollutant	Emission Factor	EF Units	Emission Factor Source	Uncontrolled Estimated Emissions @ Full Load (lb/hr)	Pollutant Control (%)	Controlled Estimated Emissions @ Full Load (lb/hr)	Controlled Annual Estimated Emissions per Engine @ Full Load (TPY)	Controlled Estimated Emissions (TPY)
NO _x	2.94	g/kWh	Vendor	2.36	0	2.36	0.0472	0.0944
CO	1.9	g/kWh	Vendor	1.52	0	1.52	0.0305	0.0610
PM _{10/2.5}	0.199	g/kWh	Vendor	0.160	0	0.160	0.00319	0.0064
VOC	0.17	g/kWh	Vendor	0.136	0	0.136	0.00273	0.0055
SO ₂	0.00205	lb/hp-hr	AP-42 3.3	1.00	0	1.00	0.0200	0.0400
CO ₂	1.15	lb/hp-hr	AP-42 3.3	561	0	561	11.2	22.4

South Valley Technology Center

Fire Pump Engines

HAP Emissions

February 24, 2026

Model: Clarke C13H0-UFAD50
Number of Engines: 2
Fuel: Diesel
Hours/yr: 40
Engine Power (kWh): 364
Total Engine Power (kWh): 728
Total Engine Power (HP): 488
Max Operating Hours/Day: 1

Hazardous Air Pollutants	Emission Factor (lb/MMBtu)	Maximum Potential Emissions Per Engine (lb/hr)	Maximum Potential Emissions All Engines (lb/hr)	Maximum Potential Emissions Per Engine (lb/day)	Maximum Potential Emissions All Engines (lb/day)	Maximum Potential Emissions Per Engine (TPY)	Maximum Potential Emissions All Engines (TPY)
Benzene	9.33E-04	3.19E-03	6.37E-03	3.19E-03	6.37E-03	6.37E-05	1.27E-04
Toluene	4.09E-04	1.40E-03	2.79E-03	1.40E-03	2.79E-03	2.79E-05	5.59E-05
Xylenes	2.85E-04	9.74E-04	1.95E-03	9.74E-04	1.95E-03	1.95E-05	3.89E-05
Formaldehyde	1.18E-03	4.03E-03	8.06E-03	4.03E-03	8.06E-03	8.06E-05	1.61E-04
Acetaldehyde	7.67E-04	2.62E-03	5.24E-03	2.62E-03	5.24E-03	5.24E-05	1.05E-04
Acrolein	9.25E-05	3.16E-04	6.32E-04	3.16E-04	6.32E-04	6.32E-06	1.26E-05
Naphthalene	8.48E-05	2.90E-04	5.79E-04	2.90E-04	5.79E-04	5.79E-06	1.16E-05
Total PAHs	1.68E-04	5.74E-04	1.15E-03	5.74E-04	1.15E-03	1.15E-05	2.30E-05
1,3-Butadiene	3.91E-05	1.34E-04	2.67E-04	1.34E-04	2.67E-04	2.67E-06	5.34E-06
TOTAL HAPs		0.014	0.027	0.014	0.027	0.00027	5.41E-04

Emission factors for uncontrolled diesel-fueled engines, AP-42, Chapter 3, Section 3, Table 3.3-2 (4/25).

South Valley Technology Center

Diesel Fuel Storage Tanks - VOC Emissions

February 24, 2026

Modeled using EPA TANKS 5.1: <https://www.epa.gov/air-emissions-factors-and-quantification/tanks-emissions-estimation-software-version-5>

Data Center Diesel Storage Fuel Tanks

Number of tanks: 14
 Tank type: Horizontal Fixed Roof
 Petroleum Type: No.2 Fuel Oil (Diesel)
 Shell Length (ft): 47.3
 Shell Diameter (ft): 12
 Max. Liquid Height (ft): 12
 Min. Liquid Height (ft): 1
 Vacuum Setting (psig): -0.03
 Pressure Setting (psig): 0.03
 Vapor Space Pressure at Normal Operating Conditions (psig): 0
 Insulated or Underground? Not Insulated
 Equipped with Control Device? No Control Device
 Calculation Method: AP-42
 Shell Color: White
 Shell Condition: New
 Met Data Location: Reno, NV

Engine Tanks

Number of tanks: 114
 Engine Tank: Storage Tank Ratio 8.143

Annual Throughput (all tanks, gal/yr) 2,226,780

Annual Throughput (per tank, gal/yr) 159,056

Annual Throughput (all tanks, gal/yr): 2,226,780

Annual Throughput (per tank, gal/yr): 19,533

TANKS Modeling Results - VOC Emissions:

Tank Description	Annual Standing Losses Per Tank (lb/yr)	Annual Working Losses Per Tank (lb/yr)	Total Annual Losses Per Tank (lb/yr)	Total Annual Losses Per Tank (TPY)	Total Annual Losses All Tanks (TPY)	Total Annual Losses All Tanks (lb/hr)
Diesel Storage Fuel Tanks	6.42	3.08	9.50	0.0048	0.067	3.80E-09
Engine Tanks*	0.79	0.38	1.17	0.00058	0.067	3.80E-09

*It is conservatively assumed that the VOC emissions from the engine tanks are equal to the VOC emissions from the storage fuel tanks.

APPENDIX C

MANUFACTURER SPECIFICATIONS

JENBACHER TYPE 4

An efficiency milestone

Based on the proven design concepts of Types 3 and 6, the modern Jenbacher Type 4 engines in the 800 to 1,560 kW power range are characterized by a high-power density and outstanding efficiency. The enhanced control and monitoring provide easy preventive maintenance, high reliability and availability.



Reference installations

J416—AGR Fenland Glasshouse, UK



AGR's Fenland Glasshouse and energy center includes a combined heat and power (CHP) plant comprising three high-efficiency Jenbacher engines that deliver electricity, while an exhaust cooling system delivers recovered CO₂ to help the plants grow. Additionally, an innovative 33 MWth heat pump system provides renewable hot water heating for the facility.

Engines	1 x J416, 1 x J620, 1 x J624
Electrical output	9 MW
Thermal output	11.2 MW
Energy source	Pipeline gas
Commissioning	2022

J420—Heslerhof, Germany



With the installation of a Jenbacher J420 engine and investments into a large buffer storage tank and a gas storage tank, the biogas plant at the Heslerhof farm in Germany was converted into a renewable storage power plant with flexible, power market-driven operation. The farm generates its own power, which is used to supply all the electricity it requires, and surplus power is fed into the grid at attractive feed-in tariffs at market rates.

Engine	1 x J420
Electrical output	1.56 MW
Thermal output	1.8 MW
Energy source	Biogas
Commissioning	2021

J420—Chok Yuen Yong Industry Co., LTD, Thailand



Five Jenbacher J420 biogas-fueled engines produce more than enough electric power to supply Chok Yuen Yong Industry Co., LTD's tapioca starch factory. The excess electricity produced by the engines—about 1,000 kW—is supplied to the public grid to further reduce the facility's power costs.

Engines	5 x J420
Electrical output	7.1 MW
Thermal output	5.2 MW
Energy source	Biogas
Commissioning	2012, 2017

J420—Hefei Xiaomiao Organic Waste Treatment Center Project, China



At the Hefei Xiaomiao Organic Waste Treatment Center Project, organic waste is pretreated and turned into biogas through anaerobic digestion at a nearly 67,000-square-meter facility. Two Jenbacher J420 biogas-fueled gensets power the facility and also supply power to the local grid.

Engines	2 x J420
Electrical output	3 MW
Thermal output	1.2 MW
Energy source	Biogas
Commissioning	2021

Technical features

Feature	Description	Advantages
Heat recovery	Flexible arrangement of heat exchanger, two stage oil plate heat exchanger on demand	– High thermal efficiency, even at high and fluctuating return temperatures
Gas dosing valve	Electronically controlled gas dosing valve with high degree of control accuracy	– Very quick response time – Rapid adjustment of air/gas ratio – Large adjustable caloric value range
Four-valve cylinder head	Enhanced swirl and channel geometry using advanced calculation and simulation methods (CFD)	– Reduced charge-exchange losses – Central spark-plug position resulting in optimal cooling and combustion conditions
Crack connecting rod	Applying a technology—tried and tested in the automotive industry—in our powerful stationary engines	– High dimensional stability and accuracy – Reduced connecting rod bearing wear – Easy to maintain

Technical data

Configuration		Dimensions l x w x h (mm)	
Bore (mm)	145	J412	5,400 x 1,800 x 2,200
Stroke (mm)	185	Generator set	J416 6,200 x 1,800 x 2,200
Displacement / cylinder (lit)	3.06	J420	7,100 x 1,900 x 2,200
Speed (rpm)	1,800/1,200 (60 Hz) 1,500 (50 Hz)	J412	6,000 x 1,800 x 2,200
Mean piston speed (m/s)	7.4 (1,200 l/min) 9.3 (1,500 l/min) 11.2 (1,800 l/min)	Cogeneration system	J416 6,700 x 1,800 x 2,200
Scope of supply	Generator set, cogeneration system, generator set / cogeneration in container	J420	7,100 x 1,800 x 2,200
Applicable gas types	Natural gas, flare gas, biogas, landfill gas, sewage gas, special gases (e.g., coal mine gas, coke gas, wood gas, pyrolysis gas)	J412	12,200 x 3,000 x 2,700 – 5,300
Engine type	J412 J416 J420	Container ¹ 40-foot	J416 12,200 x 3,000 x 2,700 – 5,300
No. of cylinders	12 16 20	J420	12,200 x 3,000 x 2,700 – 5,300
Total displacement (lit)	36.7 48.9 61.1	Weights empty (kg)	
		J412	11,200
		Generator set	J416 13,500
		J420	17,200
		J412	11,800
		Cogeneration system	J416 14,100
		J420	17,800

Outputs and efficiencies

Natural gas		1,500 l/min 50 Hz					1,800 l/min 60 Hz					1,200 l/min 60 Hz				
NO _x ^c	Type	Pel (kW) ²	Pth (kW) ²	η _{el} (%) ²	η _{th} (%) ²	η _{tot} (%)	Pel (kW) ²	Pth (kW) ²	η _{el} (%) ²	η _{th} (%) ²	η _{tot} (%)	Pel (kW) ²	Pth (kW) ²	η _{el} (%) ²	η _{th} (%) ²	η _{tot} (%)
500 mg/m ³ _{N₂}	J412	902	928	43.4	44.6	88.0	853	960	41.7	46.9	88.6	630	618	42.8	41.9	84.7
	J416	1,201	1,244	43.4	44.9	88.3	1,142	1,281	41.8	46.9	88.7	846	824	43.0	41.9	85.0
	J416	1,003	1,029	43.5	44.6	88.1	–	–	–	–	–	–	–	–	–	–
	J420	1,562	1,649	43.7	46.1	89.9	1,427	1,602	41.8	46.9	88.8	1,057	1,029	43.0	41.9	84.9
	J420	1,562	1,833	42.4	49.7	92.1	–	–	–	–	–	–	–	–	–	–
	J412	902	967	42.2	45.2	87.4	853	1,003	40.7	47.9	88.5	630	641	41.8	42.5	84.4
250 mg/m ³ _{N₂}	J416	1,201	1,285	42.3	45.2	87.5	1,142	1,338	40.9	47.9	88.7	846	856	42.1	42.6	84.7
	J416	1,003	1,045	42.9	44.7	87.6	–	–	–	–	–	–	–	–	–	–
	J420	1,501	1,605	42.7	45.6	88.4	1,427	1,648	41.1	47.5	88.7	1,057	1,085	41.7	42.8	84.6
	J420	1,562	1,906	41.4	50.5	91.9	–	–	–	–	–	–	–	–	–	–
Biogas		1,500 l/min 50 Hz					1,800 l/min 60 Hz									
NO _x ^c	Type	Pel (kW) ²	Pth (kW) ²	η _{el} (%) ²	η _{th} (%) ²	η _{tot} (%)	Pel (kW) ²	Pth (kW) ²	η _{el} (%) ²	η _{th} (%) ²	η _{tot} (%)					
500 mg/m ³ _{N₂}	J412	751	750	42.2	42.2	84.3	–	–	–	–	–					
	J412	902	916	42.7	43.3	86.0	853	916	41.2	44.2	85.4					
	J412	935	914	43.3	42.3	85.6	–	–	–	–	–					
	J416	1,004	994	42.5	42.1	84.6	–	–	–	–	–					
	J416	1,201	1,217	42.7	43.3	86.0	1,142	1,220	41.4	44.2	85.5					
	J416	1,248	1,225	43.3	42.4	85.7	–	–	–	–	–					
250 mg/m ³ _{N₂}	J420	1,501	1,518	42.8	43.3	86.1	1,427	1,527	41.3	44.2	85.6					
	J420	1,562	1,538	43.3	42.6	85.9	–	–	–	–	–					
	J412	902	930	42.0	43.4	85.4	853	933	40.5	44.3	84.8					
	J416	1,205	1,240	42.1	43.4	85.5	1,142	1,237	40.6	44.0	84.7					
	J420	1,501	1,544	42.2	43.4	85.6	1,427	1,556	40.6	44.3	85.0					

¹ The dimensions refer to the standard base models with horizontal exhaust silencer

² Technical data according to ISO 3046

³ Total heat output with a tolerance of +/- 8%, exhaust gas outlet temperature 120°C, for biogas gas outlet temperature 180°C

All data according to full load and subject to technical development and modification. Further engine versions available on request



In general, "Ready for H₂" Jenbacher units can be converted to operate on up to 100% hydrogen in the future. Details on the cost and timeline for a future conversion may vary and need to be clarified individually.

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jenbacher.com/en/contact

III. Heat Rate Guarantee.¹

Site Details

Name	South Valley
Rating	34.9kV, 60Hz
Maximum Ambient Temperature	[95°F (35°C) BEFORE DERATE] ²
Maximum Altitude	6562ft (2000m) BEFORE DERATE
Main Fuel Type	LNG
Methan Index	74 or above
Pressure	50psi

Gas Flow to Each J420 Generator Set	460 m3/hr @40C (worst case) 395 m3/hr @40C when package operate at 1200kWe
-------------------------------------	---

At full power output genset consumes 3847kW of energy in gas per hour - 13,127,000 BTU per hour
At expected derate genset consumption will reduce to 3300kW of energy in gas per hour - 11,250,000 BTU per hour

Heating Value

Consumption in scf per hour will be (scf/hr):
16245 scf/hr @ full power output (worst case)
13950 scf/hr @ derate 1.2MWe output (worst case)

Then we expect to see:
8,752 BTU/kWe @1500kWe package output
9,375 BTU/kWe @1200KWe package output
- worst case @40degC

Description	Measurement	Total
Total Gen Units	Count	90

¹ **Note to Draft:** Provisions are to be added to address the heat rate guarantee of the Generation Equipment contemplated in Seller's operational workbook provided to Buyer. Provisions to be added will address not only the guaranteed heat rate, but also responsibility for Fuel costs in excess of the guaranteed heat rate and related impacts on take-or-pay arrangement. These provisions are to be further discussed by the Parties. **Seller NTD:** Heat rate guarantee and figures subject to further review and refinement. In the interest of progressing the discussion, Seller has shared the testing information that will flow into the heat rate guarantee.

² **Note to Draft:** Operations teams to discuss temperature based de-rating.

Nameplate of each generator	MW	1.5MWe (expected reduction to 1.2MWe due to altitude)
Ancillary MW each generator (N)	MW	Included in power output above. Parasitic loads per package are: 53.6kW – Reference C02000193
Derating due to site conditions each generator	MW	20% derate 1.2MWe
Net output per generator with deration and ancillaries	MW	1.2MWe – parasitic loads are always included in our technical spec – Reference
Running prime power (N)	Count	90
Running prime power (N)	MW	108
Total installed power with deration and ancillary power	MW	111.56

Application & Performance Warranty Data
Project Information

Site Location: US
 Project Name: Jenbacher J420 SCR - No EPA Pre-Cat
 Application: Prime Power
 Number Of Engines: 90
 Operating Hours per Year: 8000

Engine Specifications

Engine Manufacturer: Jenbacher
 Model Number: J420
 Rated Speed: 1800 RPM
 Type of Fuel: Natural Gas
 Type of Lube Oil: 1 wt% sulfated ash or less
 Lube Oil Consumption: 0.1 % Fuel Consumption
 Number of Exhaust Manifolds: 1

Engine Cycle Data

Load	Speed	Power	Exhaust Flow	Exhaust Temp.	Fuel Cons.	NO _x	CO	NMNEHC	CH ₂ O	PM	O ₂	H ₂ O
%		bhp	lb/hr	° F		g/bhp-hr	g/bhp-hr	g/bhp-hr	g/bhp-hr	g/bhp-hr	%	%
100	Rated	2,146	18,415	819		0.81	2	0.1	0.2	0.01	10	17

Emission Data (100% Load)

Emission	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	g/bhp-hr	tons/yr	ppmvd @ 15% O ₂	ppmvd	g/kW-hr	lb/MW-hr	g/bhp-hr	tons/yr	ppmvd @ 15% O ₂	ppmvd	g/kW-hr	lb/MW-hr	
NO _x *	0.81	15.33	86	158	1.086	2.39	0.05	0.95	5	10	0.067	0.15	93.8%
CO	2	37.85	347	641	2.682	5.91	0.05	0.98	9	17	0.07	0.15	97.4%
NMNEHC**	0.1	1.89	30	56	0.134	0.3	0.02	0.38	6	11	0.027	0.06	80%
CH ₂ O	0.2	3.78	32	60	0.268	0.59	0.02	0.38	3	6	0.027	0.06	90%
PM	0.01	0.19	4	7	0.013	0.03							
NH ₃							0.04	0.66	10	18	0.047	0.1	

* MW referenced as NO₂

** MW referenced as CH₄. Propane in the exhaust shall not exceed 15% by volume of the NMHC compounds in the exhaust, excluding aldehydes. The 15% (vol.) shall be established on a wet basis, reported on a methane molecular weight basis. The measurement of exhaust NMHC composition shall be based upon EPA method 320 (FTIR), and shall exclude formaldehyde.

System Specifications**SCR/Oxidation System Specifications (NRLZ-36-J-TBD, ACIS II, Commissioning & Startup, SP-IQ2-34-TBD, MS3-20PF-3, IB-NRLZ-36-TBD, SP-RTS-350-TBD, PLZ-96239-36-TBD, SP-RACK-TBD)**

Housing Model Number:	SP-IQ2-34-TBD-HSG-0
Element Model Number:	SCRC-140-150-450
Number of Catalyst Elements per Engine:	2
Number of Spare Catalyst Layers:	0
SCR Catalyst Space Velocity:	9,334 1/hr
Sound Attenuation:	25-30 dBA insertion loss
Reactant:	Urea
Percent Concentration:	32.5%
Design Exhaust Flow Rate:	18,415 lb/hr
Design Exhaust Temperature ¹ :	819° F
Exhaust Temperature Limits:	572° F – 977° F
SCR Catalyst Volume:	26 ft ³
System Dosing Capacity:	6 L/hr
System Pressure Loss:	14.4 inH ₂ O (Clean)
Total Catalyst Volume:	26 ft ³
Estimated Reactant Consumption:	1.0 gal/hr (4 L/hr) / Per Engine



LIMITED WARRANTY

1. **Warranty Period** Products have different warranty periods and are subject to the conditions and exclusions contained herein. Seller warrants that the:

APX1 (One-Year) Catalyst Elements for Reciprocating Engine applications. The product shall achieve the emission levels defined in the Proposal, within the conditions and limitations defined in Section 2 (below), for a period of twelve (12) months from the date the Product is complete and ready for shipment;

APX2 (Two-Year) Catalyst Elements for Reciprocating Engine applications. The product shall achieve the emission levels defined in the Proposal, within the conditions and limitations defined in Section 2 (below), for a period of twenty-four (24) months from the date the Product is complete and ready for shipment;

APX3 (Three-Year) Catalyst Elements for Reciprocating Engine applications. The product shall achieve the emission levels defined in the Proposal, within the conditions and limitations defined in Section 2 (below), for a period of thirty-six (36) months from the date the Product is complete and ready for shipment;

APXP (Propane) Catalyst Elements for Reciprocating Engine applications. The product shall achieve the emission levels defined in the Proposal, within the conditions and limitations defined in Section 2 (below), for a period of thirty-six (36) months from the date the Product is complete and ready for shipment

Gas Turbine Catalyst Elements shall achieve the emission levels and performance warranty period defined in the Proposal within the conditions and limitations defined in Section 2 (below). Gas Turbine Catalyst is a custom product. Please consult your Proposal for project-specific warranties and emission guarantees;

Specialty Catalyst Elements shall be free of defects in material and workmanship and shall be free of defects in material and workmanship and shall achieve the emission levels defined in the Proposal, within the conditions and limitations defined in Section 2 (below), for a period of twelve (12) months from the date the Product is complete and ready for shipment;

Siloxane Gas (designated with "SG") Catalyst Elements for Reciprocating Engine applications operating on landfill gas, digester gas, sewage gas and other siloxane-bearing fuels, carry no warranty;

SCR Products. Unless other terms are specified in the Proposal (which shall supersede these General Terms and Conditions), SCR Products shall be free of defects in material and workmanship and shall achieve the emission levels within the conditions and limitations defined in Section 2 (below), for a period of twenty-four (24) months from the date the Product is placed in operation or thirty (30) months from the date the Product is complete and ready for shipment, whichever shall first occur;

Passive Diesel Particulate Filter Products shall be free of defects in material and workmanship and shall achieve the emission levels defined in the Proposal, within the conditions and limitations defined in Section 2 (below), for a period of for a period of 8,000 hours of operation or twenty-four (24) months from the date the Product is ready for shipment, whichever shall first occur;

Active Diesel Particulate Filter Products included with AT-IV shall be free of defects in material and workmanship and shall achieve the emission levels defined in the Proposal, within the conditions and limitations defined in Section 2 (below), for a period of 2,600 hours of operation, twelve (12) months from the date the Product is commissioned by an authorized MIRATECH field service representative, or eighteen (18) months from the date the Product is ready for shipment to Purchaser, whichever shall first occur;

Service shall be free of defects of workmanship for a period of ninety (90) days from the date the final Service is provided by Seller to Purchaser;

Housings shall be free of defects in material and workmanship for a period of twelve (12) months from the date the Product is complete and ready for shipment;

Silencer Only Products shall be free of defects in material and workmanship for a period of twelve (12) months from the date the Silencer Only Product is placed in operation or eighteen (18) months from the date the Silencer Only Product is complete and ready for shipment, whichever shall first occur;

Emissions Data for Stabilis Gas Fired Vaporizers

- Quantity of two – Dual Burner Vaporizers at South Valley Site
 - Potential for three – Single Burner could be used, but two – Dual Burner Vaporizers is worst case scenario.
- Exhaust stack diameter for Gas Fired Vaporizer – 24 in (2 qty)
- Top of Gas Fired Vaporizer exhaust stack from base – 22 ft (2 qty)
- Exhaust Temperature – Between 650°F and 750°F
- Velocity of Exhaust Flow – Between 75 ft/s and 85 ft/s

Note: Stabilis is currently proposing the use of two dual-burner, gas-fired vaporizers. Each vaporizer will utilize the 30 ppm model, resulting in a maximum burn rate of 26 MMBtu/hr per burner. With two dual-burner vaporizers, we can expect approximately 4 tons of NOx per burner, bringing the total annual output to 16.85 tons.

There is potential for a reduction in NOx emissions if the Stabilis team can implement three single-burner vaporizers instead. However, we are still awaiting the final solution from Stabilis.

MMBTU/Hr	26
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Constituent	Abbr.	Pounds of Emissions per MMBTU Input	Total Pounds per Hr	Total Pounds per Day	Total Pounds per Year	Total Tons per Year
Nitrogen Oxide Model: *30ppm*	NOx	0.037	0.962	23.088	8,427	4
Carbon Dioxide	CO2	9%	2.34	56.16	20,498	10
Carbon Monoxide	CO	0.037	0.962	23.088	8,427	4
Hydrocarbons	HC	0.025	0.65	15.6	5,694	3
VOC (Non-Methane)	VOC	0.0054	0.1404	3.3696	1,230	1
Particulate Matter	PM	0.0075	0.195	4.68	1,708	1
Sulfur Dioxide	Sox	0.0006	0.0156	0.3744	137	0

Up to Four (4) Burners
16.85
41.00
16.85
11.39
2.46
3.42
0.27

* Final vaporization solution will consist of up to four (4) burners.

** Column is estimated max annual emissions for the LNG system based on all units at high fire continuously 24/7/365

VOLVO PENTA

NO: 164069

EXHAUST EMISSION DECLARATION

The emission data in this declaration are measured according to the test procedures specified below and on one member engine of the engine type. Emission data may vary among production engines.

TECHNICAL SPECIFICATION

Engine type: TWD1683GE
Module No: 138090511
Rated crankshaft power *): 685 kW
Rated speed: 1800 rpm
*) Stand-by power without fan acc. to ISO 3046.

TEST INFORMATION

Test conditions: 40 CFR part 1039
Test identification: 22011844
Test date: 2019-04-06
Test cycle: D2 Test cycle

EXHAUST EMISSIONS (weighted cycle)

CO (g/kWh)	0,066
HC (g/kWh)	0,013
NOx (g/kWh)	0,40
PM (g/kWh)	0,0137

EXHAUST EMISSIONS (per cycle mode)

Mode	#	1	2	3	4	5
Power	(kW)	685	514	342	171	68
NOx	(g/h)	141,1	154,5	106,6	112,1	194,4
HC	(g/h)	6,378	6,112	5,793	4,198	3,643
CO	(g/h)	47,73	31,35	20,05	11,62	15,2
CO ₂	(kg/h)	432,9	320	219,1	121,5	63,37
NOx Dry	(ppm)	24,29	31,35	26,47	40,33	99,68
HC Wet	(ppm)	3,578	4,039	4,679	4,907	6,059
CO Dry	(ppm)	14,42	11,07	8,588	7,145	13,06
CO ₂	(%)	8,27	7,133	5,907	4,69	3,44
O ₂	(%)	9,651	11,2	12,87	14,56	16,25

TA-Luft

Test identification: 22011844
Test date: 2019-04-06

Mode	#	1	2	3	4
Power	(kW)	685,4	514,1	342,7	171,4
NOx (O ₂)	(mg/Nm ³)	2348	2689	2523	2301
HC (O ₂)	(mg/Nm ³)	22,43	28,61	37,64	56,13
CO (O ₂)	(mg/Nm ³)	46,55	41,5	52,85	108,9
PM (O ₂)	(mg/Nm ³)	5,813	4,376	4,756	4,83

Gothenburg 2019-07-10



Jennifer Åhlberg
Director Emission Compliance
Quality, Environment, Product Compliance
AB Volvo Penta

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TWD1683GE

23776347**03****Important**

This Technical Data Sheet and the corresponding Installation Instructions provide important information to ensure the installed engine will operate according to the design specification in the Volvo Penta application for certification.

Requirements marked with  are considered as critical for exhaust emissions compliance according to the design specification in the Volvo Penta application for certification.

Failing to follow and meet these instructions and requirements when installing a certified engine in a piece of nonroad equipment for use in the United States violates U.S. federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act.

General

In-line four stroke turbocharged diesel engine with direct injection.

Rotation direction, anti-clockwise viewed towards flywheel.

Number of cylinders			6
Displacement, total	litre		16,12
	in ³		983,9
Firing order			1-5-3-6-2-4
Bore	mm		144
	in		5,67
Stroke	mm		165
	in		6,50
Compression ratio			16,8:1
Wet weight w/o EATS	Engine only	kg	1810
		lb	3990
	Engine incl. cooling system and air filtration system	kg	2217
		lb	4888
	Engine incl. cooling system, air filtration system, and frame	kg	2767
		lb	6100
Wet weight EATS only	EATS (XL Urea Tank, 165 Liters)	kg	255
		lb	562
	EATS (L Urea Tank, 70 Liters)	kg	226
		lb	498

Performance

		rpm	1500	1800
Prime Power	without fan	kW	590	626
		hp	802	851
	with fan	kW	570	596
		hp	775	811
Standby Power	without fan	kW	647	685
		hp	880	932
	with fan	kW	627	655
		hp	853	891
COP Power	without fan	kW	443	470
		hp	602	639
	with fan	kW	428	447
		hp	581	608
Torque at:	Prime Power	Nm	3756	3321
		lbft	2770	2449
	Standby Power	Nm	4119	3634
		lbft	3038	2680
Total mass moment of inertia, J (mR ²)		kgm ²	2,50	
		lbft ²	59,3	

Derating due to altitude - see Technical Diagrams

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03**Engine noise emission**

Test Standards: ISO 3744-1981 (E) sound power with fan

Tolerance ± 0.75 dB(A)

		rpm	1500	1800
Measured sound power Lw	No load	dB(A)	118,2	119,3
	Prime Power	dB(A)	118,2	119,8
	Standby Power	dB(A)	117,8	119,9
Calculated sound pressure Lp at 1 m	No load	dB(A)	106,2	107,3
	Prime Power	dB(A)	106,2	107,8
	Standby Power	dB(A)	105,8	107,9

Test conditions for load acceptance data

Warm engine.	Generator	Model	Type of AVR
	ABB	AMG 0355CC04 DBPM	Basler-Electric DECS-150
AVR Settings	UFRO (Hz):	3 DIP: 1.4	DWELL: 1.4
		Voltage (V): 400	Power factor: 1.0

Load acceptance performance can vary due to actual alternator inertia, voltage regulator, type of load and local ambient conditions.

Abbreviation:	Full name:	Descriptions
AVR	Automatic Voltage Regulator	Generator performance and safety control unit
UFRO	Under Frequency Roll Off	Overheating protection at under frequency
DIP		Controls the slope of voltage drop when the UFRO is active
DWELL		Controls the slope of voltage recovery when the UFRO is active.

Load Acceptance at 1500 rpm

Genset Classification

This engine fulfills G1, G2 and G3 classes, according to ISO8528-5. For other class, please, see the table below.

Load (%)	Speed diff (%)	Speed Recovery time (s)	
0-47	7 (G3)	1,8	G3 boundary conditions
0-54	10 (G2)	2,0	G2 boundary conditions

Load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)	Remaining load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)
0-20	1,9	1,3	-	-	20-100	19,8	3,3	19,0	1,9
0-40	4,9	1,2	0,8	0,8	40-100	10,3	1,9	7,5	1,2
0-60	14,9	2,1	13,1	1,7	60-100	4,0	1,3	1,5	1,3
0-80	23,2	3,6	25,4	2,5	80-100	1,7	0,7	0,8	0,8
0-100	30,0	4,6	35,5	3,5					
0-110	31,7	5,0	38,3	3,7					
100-0	9,8	2,6	4,3	2,0					

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TWD1683GE**23776347****03****Load Acceptance at 1800 rpm**

Genset Classification

This engine fulfills G1, G2 and G3 classes, according to ISO8528-5. For other class, please, see the table below.

Load (%)	Speed diff (%)	Speed Recovery time (s)	
0-55	7 (G3)	1,2	G3 boundary conditions
0-64	10 (G2)	1,3	G2 boundary conditions

Load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)	Remaining load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)
0-20	1,3	0,5	-	-	20-100	11,4	1,5	12,0	1,2
0-40	2,8	0,8	-	-	40-100	6,2	0,9	3,2	0,9
0-60	7,5	1,0	5,0	1,0	60-100	3,4	0,7	1,3	0,9
0-80	13,8	1,6	15,8	1,6	80-100	1,4	0,7	1,0	0,6
0-100	19,6	2,2	25,8	2,0					
0-110	21,6	2,5	29,5	2,4					
100-0	4,0	1,2	4,3	1,8					

Cold start performance	Ambient Temp. [°C]	Manifold Heater	Block heater	RPM	
				1500	1800
Time to Set Speed from start	20	-	-	4,7 sec.	5,0 sec.
	5	-	-	4,8 sec.	6,3 sec.
	-15 *	Yes	-	7,0 sec.	6,8 sec.
	-30 **	Yes	Yes	6,2 sec.	6,7 sec.

Min start temp w/o Block Heater* -30 °C

* With manifold heater 6 kW engaged, lubrication oil SAE 10W/30.

** With manifold heater 6 kW engaged, lubrication oil SAE 10W/30 and block heater, Fuel MK-1.

Block heater type	Power kW	Engaged hours	Cooling water temp engine block
Volvo partnumber: 23012775	2	15	7°C 45°F

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Lubrication system		rpm	1500	1800
Lubricating oil consumption	Prime Power	litre/h	0,07	0,08
		US gal/h	0,018	0,022
	Standby Power	litre/h	0,10	0,10
		US gal/h	0,025	0,026
Oil system capacity including filters		litre	48	
		US gal	12,7	
Oil sump capacity:	max	litre	42	
		US gal	11,1	
	min	litre	32	
		US gal	8,5	
Oil change intervals/specifications:	VDS 4.5 10W/30	h	500	
Engine angularity limits:	front up	°	30	
	front down	°	30	
	side tilt	°	30	
Oil pressure at rated speed		kPa	395 - 415	
		psi	57 - 60	
Lubrication oil temperature in oil sump:	max	°C	130	
		°F	266	
Oil filter micron size		μ	40,000	

* See also general section in the sales guide

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TWD1683GE**23776347****03****Fuel system****Prime Power**Specific **fuel** consumption at:

		rpm	1500	1800
	25%	g/kWh	214	230
		lb/hph	0,347	0,373
	50%	g/kWh	195	203
		lb/hph	0,316	0,329
	75%	g/kWh	191	196
		lb/hph	0,309	0,317
	100%	g/kWh	191	195
		lb/hph	0,309	0,315
% DEF consumption at: (Compare to Fuel consumption by Volyme)	25%	%	6,3	5,6
	50%	%	7,2	6,3
	75%	%	7,0	6,8
	100%	%	6,6	6,2

Standby PowerSpecific **fuel** consumption at:

	25%	g/kWh	211	225
		lb/hph	0,341	0,364
	50%	g/kWh	194	201
		lb/hph	0,315	0,325
	75%	g/kWh	191	194
		lb/hph	0,310	0,315
	100%	g/kWh	193	196
		lb/hph	0,313	0,318
% DEF consumption at: (Compare to Fuel consumption by Volume)	25%	%	6,6	5,7
	50%	%	7,2	6,4
	75%	%	6,7	6,7
	100%	%	6,4	5,9

CO2 emission declarationCarbon dioxide (CO₂) emissions determined during the EU type approval process, NRSC-D2.

	rpm	1500	1800
g/kWh		619	647

Fuel system

Fuel to conform to

EN590:2013
 ASTM D 975 1-D and 2-D
 EN15940:2016 (GTL/HVO)
 SS-155435:201 (MK1)

	rpm	1500	1800
System supply flow at:	litre/h	177,0	195,0
	US gal/h	46,8	51,5
Fuel supply line max restriction (Measured at fuel inlet connection)	kPa	-20,0	-20,0
	psi	-2,9	-2,9
Fuel supply line max pressure, engine stopped	kPa	16,5	16,5
	psi	2,4	2,4
System return flow	litre/h	25,0	25,0
	US gal/h	6,6	6,6
Fuel return line max restriction (Measured at fuel return connection)	kPa	20,0	20,0
	psi	2,9	2,9
Maximum allowable inlet fuel temp (Measured at fuel inlet connection)	°C	60	60
	°F	140	140
Prefilter / Water separator micron size	μ	30	
Fuel filter micron size	μ	5	
Governor type/make, standard	Volvo / EMS 2.4		
Injection pump type/make	Unit Injector Delphi		

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TWD1683GE**23776347****03****Intake and exhaust system**

		rpm	1500	1800
Air consumption at: (+25°C and 100kPa)	Prime Power	m ³ /min	43	48
		cfm	1519	1695
	Standby Power	m ³ /min	45	51
		cfm	1589	1801

**See front page for important information**

Max allowable air intake restriction including piping

kPa	3	3
psi	0,4	0,4

Air filter restriction clean Volvo Penta filter

kPa	2,3	2,5
psi	0,3	0,4

Heat rejection to exhaust at:

Prime Power

kW	393	438
BTU/min	22350	24909

Standby Power

kW	448	495
BTU/min	25477	28150

Exhaust gas temperature after turbine at:

Prime Power

°C	434	432
°F	813	810

Standby Power

°C	464	461
°F	867	862

**See front page for important information**Max allowable back pressure in exhaust line
(after turbine)

Prime Power

kPa	20	20
psi	2,9	2,9

Pipe dimension Ø: 200 mm

Standby Power

kPa	20	20
psi	2,9	2,9

**See front page for important information**Max allowable temperature drop between turbine and SCR
muffler inlet.

Prime Power

Δ°C	10	10
Δ°F	18	18

Standby Power

Δ°C	10	10
Δ°F	18	18

SCR muffler pressure drop
(at exhaust max Power)

Standby Power

kPa	10	10
psi	1,5	1,5

Exhaust gas flow at:
(temp and pressure after turbine at max Power)

Standby Power

m ³ /min	104,0	113,0
cfm	3673	3991

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TWD1683GE**23776347****03****Cooling system**

Cooling system		rpm	1500	1800
Heat rejection radiation from engine at max Power:		kW	20	20
		BTU/min	1137	1137
Radiator cooling system type		Closed circuit		
Standard radiator core area		m²	1,68	
		foot²	18,08	
Fan diameter		mm	965	
		in	37,99	
Fan power consumption		kW	20	30
		hp	27	41
Fan drive ratio		1,04:1		
Coolant capacity,	engine only	litre	33	
		US gal	8,72	
	charge air coolers	litre	10	
		US gal	2,64	
	coolant radiators incl piping	litre	48	
		US gal	12,68	
	expansion tank	litre	20	
		US gal	5,28	
Coolant pump		drive/ratio	Belt / 1,85:1	
Thermostat	start to open	°C	82	
		°F	180	
	fully open	°C	92	
		°F	198	
Maximum static pressure head		kPa	100	
(expansion tank height + pressure cap setting)		psi	14,5	
Minimum static pressure head		kPa	70	
(expansion tank height + pressure cap setting)		psi	10,2	
Standard pressure cap setting		kPa	100	
		psi	14,5	
Maximum top tank temperature		°C	107	
		°F	225	
Charge air pressure		kPa	350	
(after charge air coolers)		psi	50,8	

**See front page for important information**

Max allowable Charge air outlet temp. (Charge air temp after intercooler)	Prime Power	°C	50	50
		°F	122	122
Amb. Temp. 25°C	Standby Power	°C	50	50
		°F	122	122

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03**OEM cooling system design:****- remote position of standard radiators**

	rpm	1500	1800
Maximum additional coolant with standard expansion tank	litre	15	15
	US gal	4	4
Maximum distance in vertical direction with standard pressure cap (100 kPa)	m	4	4
	ft	13	13
Maximum additional pressure drop due to remote position	KPa	10	10
	psi	1	1

OEM cooling system design: 2-circuit system**- engine coolant circuit**

		rpm	1500	1800
Heat rejection to coolant	Prime Power	kW	188	214
		BTU/min	10691	12170
engine coolant circuit:	Standby Power	kW	188	218
		BTU/min	10691	12397
Min coolant flow engine coolant circuit (at fully open thermostat)	litre/s	6,5	7,7	
	US gal/s	1,71	2,04	
Maximum coolant temperature entering engine (25°C amb. Temp.)	°C		82	
	F		180	
Maximum external engine coolant circuit restriction, including piping (25°C amb. Temp.)	kPa		90	
	psi		13,1	
Nominal coolant pressure	kPa	100	100	
	psi	14,5	14,5	
- charge air cooler (CAC) coolant circuit				
Heat rejection to coolant	Prime Power	kW	139	160
		BTU/min	7905	9099
CAC coolant circuit:	Standby Power	kW	151	167
		BTU/min	8587	9497
Nominal coolant flow CAC coolant circuit:	litre/s	1,7	2,0	
	US gal/s	0,45	0,53	
Maximum coolant temperature entering CAC (at air inlet temperature 25°C)	°C		40	
	F		104	
Coolant pressure drop over Low Temp. Radiator (at Nominal coolant flow CAC coolant circuit above)	kPa	65	85	
	psi	9,4	12,3	
Nominal CAC coolant pressure	kPa	100	100	
	psi	14,5	14,5	

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TWD1683GE**23776347****03**

Cooling performance

Standard fan:	Fan ratio: 1: 1,04	Fan type: FIX
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Cooling air flow and external restriction at different radiator air temperatures based on 107°C TTT and 40% antifreeze. Valid at 1 atm.
(radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp °C	PRIME POWER		STANDBY POWER	
		Air flow m ³ /s	External restriction Pa	Air flow m ³ /s	External restriction Pa
1500	66	11,4	0		
	64	11,0	100		
	63	10,4	200		
	62	10,0	300	11,4	0
	60			11,0	100
	59			10,4	200
	58			10,0	300
1800	67	13,4	0		
	66	12,7	100		
	65	12,2	200		
	64	11,7	300	13,4	0
	62			12,7	100
	61			12,2	200
	59			11,7	300

Note! External restrictions are calculated for values >0 Pa

VOLVO PENTA

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03**Engine management system**

Functionality	Alternatives	Default setting
Governor mode	Isochronous	Isochronous
Governor droop		
Governor response	Adjustable PID-constants (VODIA)	
Dual speed	1500rpm 50Hz/ 1800 rpm 60Hz	1500 rpm 50 Hz
Idle speed	900-1200rpm	900rpm
Fine speed adjustment	+ - 90 rpm	
Stop function		
Preheating function	On / Off	
Lamp test		

Engine sensor and switch settings

Parameter	Unit	Warning Level (Yellow)	Alarm level (Red)	Engine protection	
				Default	Optional
Oil temp	°C	125	130,0	Shut down.	N/A
Oil pressure	Low idle	170	145,0	Shut down	N/A
	1500 rpm	300,0	275,0	Shut down	N/A
	1800 rpm	300,0	275,0	Shut down	N/A
Oil level			Low level		N/A
DEF Dosing injector failure		Min. Level		Shut down	N/A
Piston cooling pressure >1000 rpm	kPa	N/A	N/A	N/A	N/A
Coolant temp	°C	103	107,0	Shut down.	N/A
Coolant level		On	Low level	Shut down.	N/A
Fuel feed pressure	Low idle				N/A
	>1400 rpm				N/A
Water in fuel					N/A
Crank case pressure	kPa	N/A	N/A	N/A	N/A
Air filter pressure droop	kPa				N/A
Altitude, above sea	m			Automatic derating, see section derating	N/A
Charge air temp	°C	80	82,5	Shut down	N/A
Charge air pressure	kPa	30 above demanded	40 above demanded	Shut down	N/A
Engine speed	rpm	115% of rated speed	Alarm level	Shut down.	N/A
Exhaust Temperature (Before SCR volume)	°C	530	550,0	Shut down.	N/A

Engine protection can be disabled. For consequences please see VP International Limited Warranty Policy

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03**Electrical system**

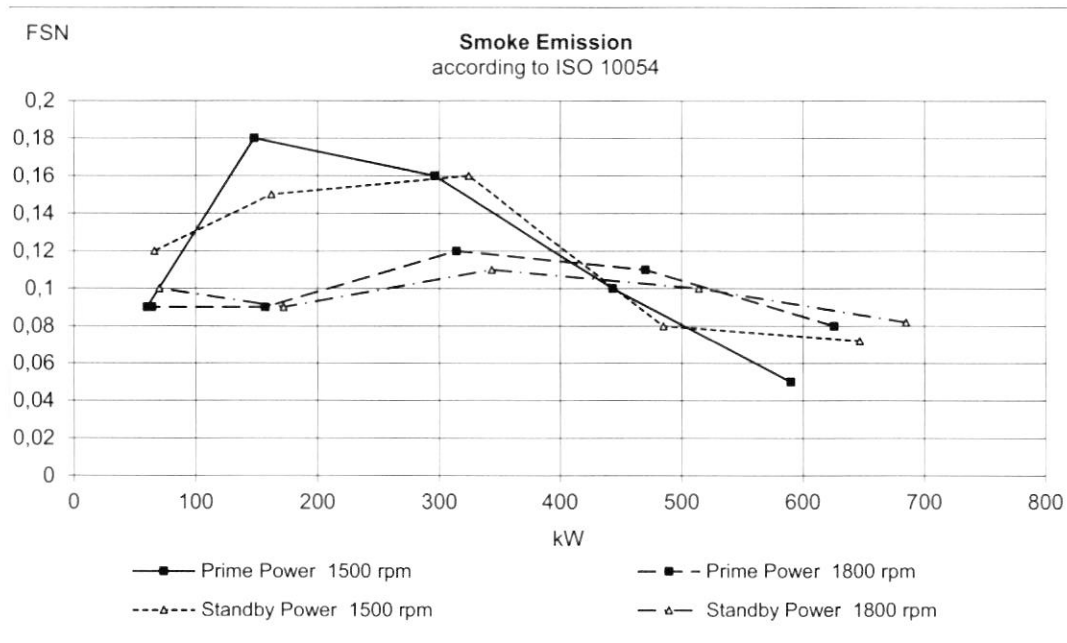
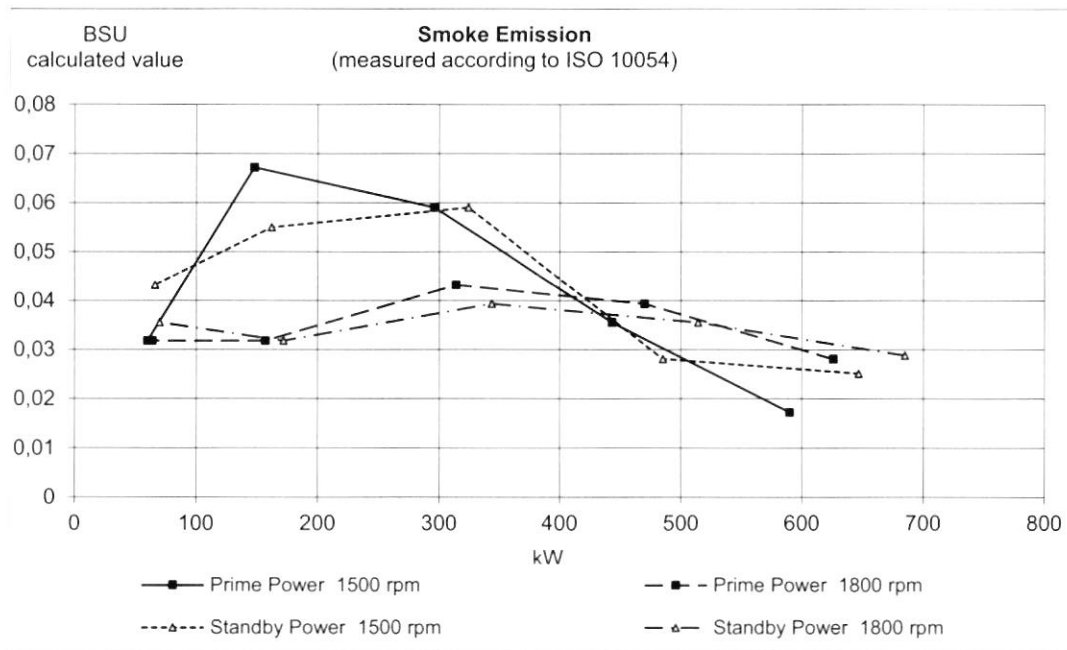
Voltage and type		24 V /insulated from earth
Alternator:	make/output	A Bosch / 80
	tacho output	Hz/alt. Rev 6
	drive ratio	3,94 : 1
Starter motor	make	Mitsubishi electric
	type	24 V 7 kW 12/3. 17F
	kW	7,0
Number of teeth on:	flywheel	153
	starter motor	12
Max wiring resistance main circuit	mΩ	3
Cranking current at +20°C	A	400
Crank engine speed at 20°C	rpm	155
Starter motor battery capacity:	min	Ah 2 x 145
	CCA at -18°C	Ah/A 900
Inlet manifold heater (at 24 V)	kW	3,6
Power relay for the manifold heater	A	1

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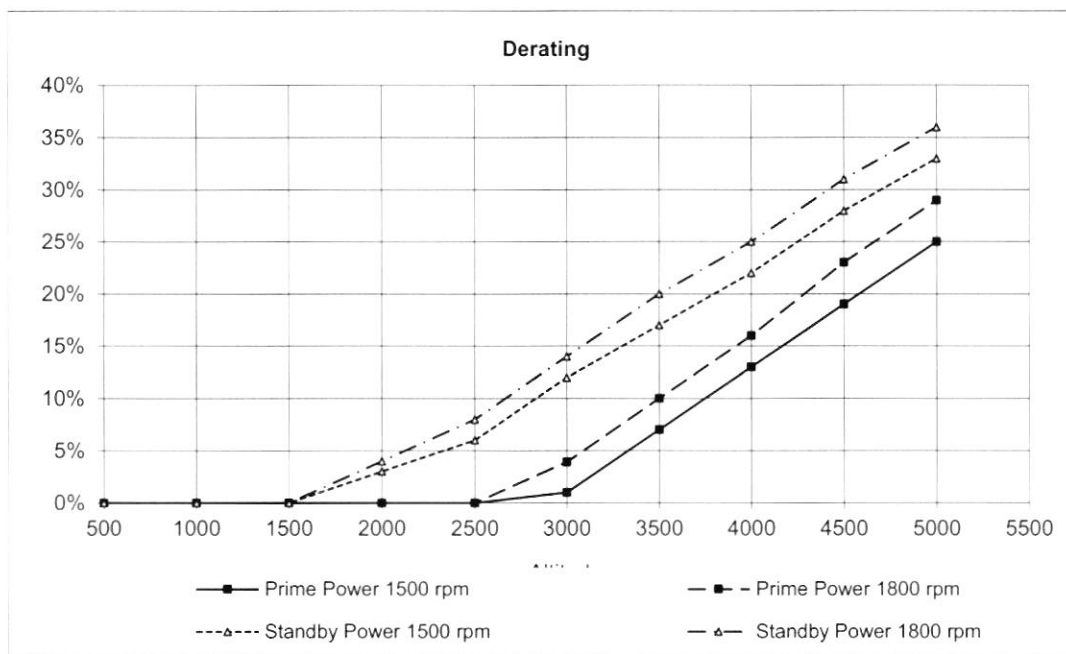
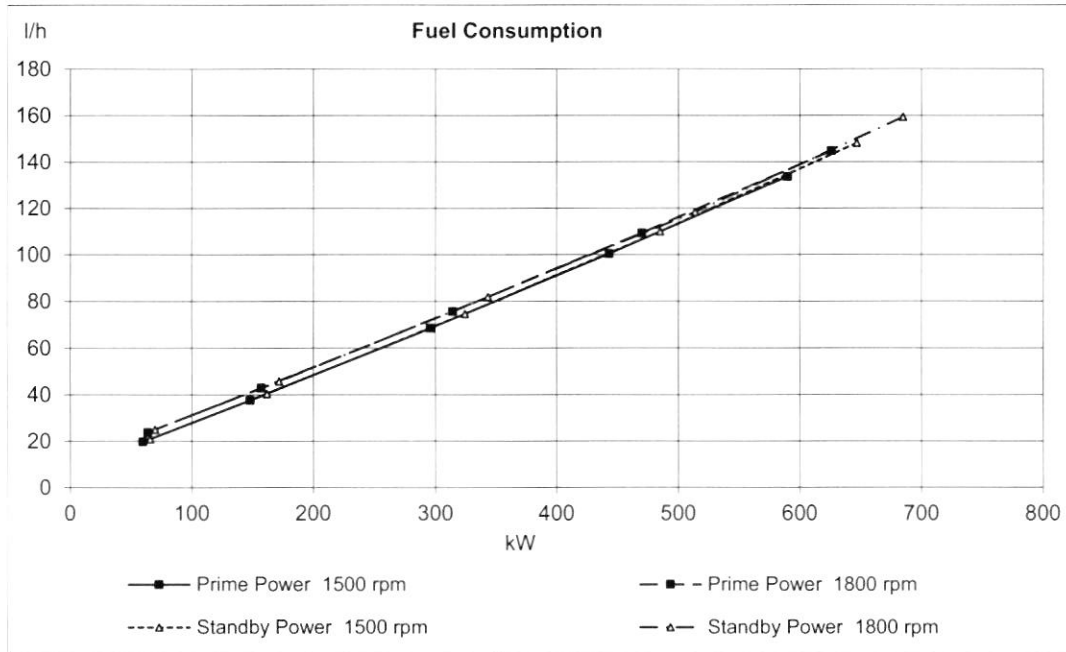
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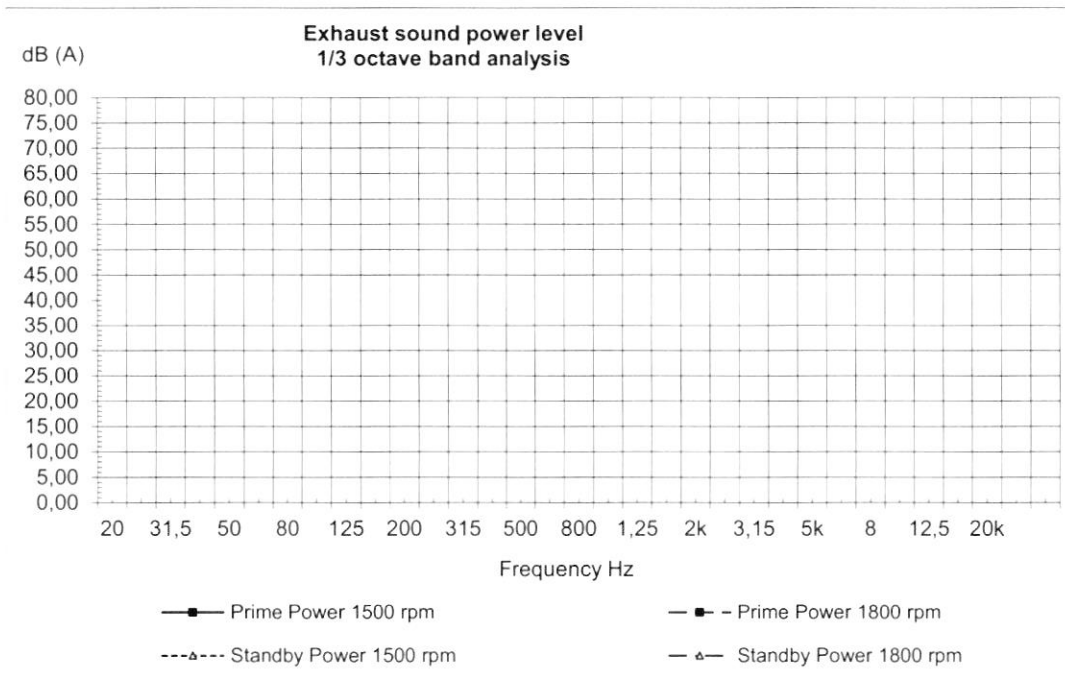
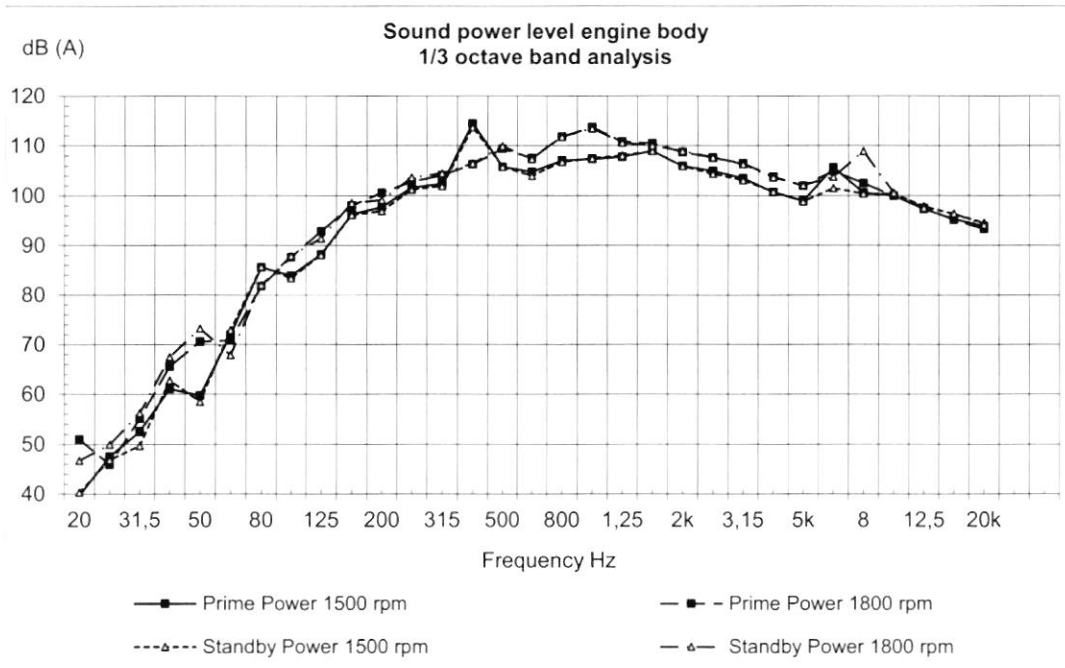
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VOLVO PENTA**TWD1683GE**

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03

Cat® 3516E

High Power Density (HPD) Diesel Generator Sets

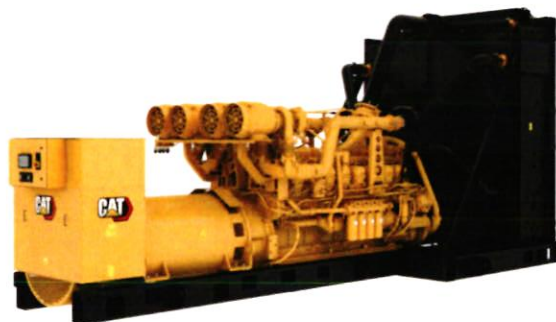


Image shown may not reflect actual configuration.

Bore – mm (in)	170 (6.69)
Stroke – mm (in)	215 (8.46)
Displacement – L (in ³)	78.1 (4766)
Compression Ratio	13.9:1
Aspiration	TA
Fuel System	MEUI
Governor Type	ADEM™ A5

Mission Critical 60 Hz kW (kVA)	Emissions Performance
3000 (3750)	U.S. EPA Certified for Emergency Stationary Applications (Tier 2)

Features

Cat® Diesel Engine

- Meets U.S. EPA Stationary Emergency Use Only (Tier 2) emissions standards
- Reliable performance proven in thousands of applications worldwide
- Certified alternative fuels including Hydrotreated Vegetable Oil (HVO), Renewable Diesel (RD) and Hydrotreated Renewable Diesel (HRD) which meet EN 15940 or ASTM D975 can be used or blended with EN 590 diesel

Generator Set Package

- Accepts 100% block load in one step
- Meets NFPA 110 loading requirements
- Conforms to ISO 8528-5 G3 load acceptance requirements
- Reliability verified through torsional vibration, fuel consumption, oil consumption, transient performance, and endurance testing

Alternators

- Superior motor starting capability minimizes need for oversizing generator
- Designed to match performance and output characteristics of Cat diesel engines

Cooling System

- Cooling systems available to operate in ambient temperatures up to 50°C (122°F)
- Tested to ensure proper generator set cooling

Cat Energy Control System (ECS)

- User-friendly interface and navigation
- Scalable system to meet a wide range of installation requirements
- Expansion modules and site specific programming for specific customer requirements
- Graphical touchscreen display
- Easily upgradeable

Warranty

- 24 months/1000-hour warranty for standby and mission critical ratings
- Extended service protection is available to provide extended coverage options

Worldwide Product Support

- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- Your local Cat dealer provides extensive post-sale support, including maintenance and repair agreements

Financing

- Caterpillar offers an array of financial products to help you succeed through financial service excellence
- Options include loans, finance lease, operating lease, working capital, and revolving line of credit
- Contact your local Cat dealer for availability in your region

**3516E Diesel Generator Sets
High Power Density (HPD)
Electric Power**



Standard and Optional Equipment

Engine

Air Cleaner

- ☐ Single element
- ☐ Dual element

Muffler

- ☐ Industrial grade (15 dB)
- ☐ Critical grade (25 dB)
- ☐ Hospital grade (35 dB)

Starting

- ☐ Standard batteries
- ☐ Oversized batteries
- ☐ Dual electric starting motors
- ☐ Air starter(s)
- ☐ Jacket water heater

Alternator

Output voltage

- ☐ 480V ☐ 12470V
- ☐ 600V ☐ 13200V
- ☐ 4160V ☐ 13800V

**Temperature Rise
(over 40°C ambient)**

- ☐ 150 °C
- ☐ 125 °C/130 °C

Winding type

- ☐ Random wound
- ☐ Form wound

Excitation

- ☐ Internal excitation (IE)
- ☐ Permanent magnet (PM)

Attachments

- ☐ Anti-condensation heater
- ☐ Stator and bearing temperature monitoring and protection

Power Termination

Type

- ☐ Bus bar
- ☐ Circuit breaker
- ☐ 5000A ☐ UL
- ☐ 3-pole ☐ 4-pole
- ☐ Manually operated
- ☐ Electrically operated

Trip Unit

- ☐ LSI ☐ LSI-G
- ☐ LSIG-P

Control System

Controller

- ☐ Cat ECS 100
- ☐ Cat ECS 200
- ☐ EMCP 4.4

Attachments

- ☐ Local annunciator module
- ☐ Remote annunciator module
- ☐ Expansion I/O module
- ☐ Remote monitoring software

Charging

- ☐ Battery charger – 10A
- ☐ Battery charger – 20A
- ☐ Battery charger – 35A

Vibration Isolators

- ☐ Spring
- ☐ Seismic rated

Cat Connect

Connectivity

- ☐ Ethernet
- ☐ Cellular

Extended Service Options

Terms

- ☐ 3 year
- ☐ 5 year
- ☐ 10 year

Coverage

- ☐ Silver
- ☐ Gold
- ☐ Platinum
- ☐ Platinum Plus

Ancillary Equipment

- ☐ Automatic transfer switch (ATS)
- ☐ Paralleling switchgear
- ☐ Paralleling controls

Certifications

- ☐ ULC 2200 Listed
- ☐ IBC seismic certification

Note: Some options may not be available on all models. Certifications may not be available with all model configurations. Consult factory for availability.

3516E Diesel Generator Sets High Power Density (HPD) Electric Power



Package Performance

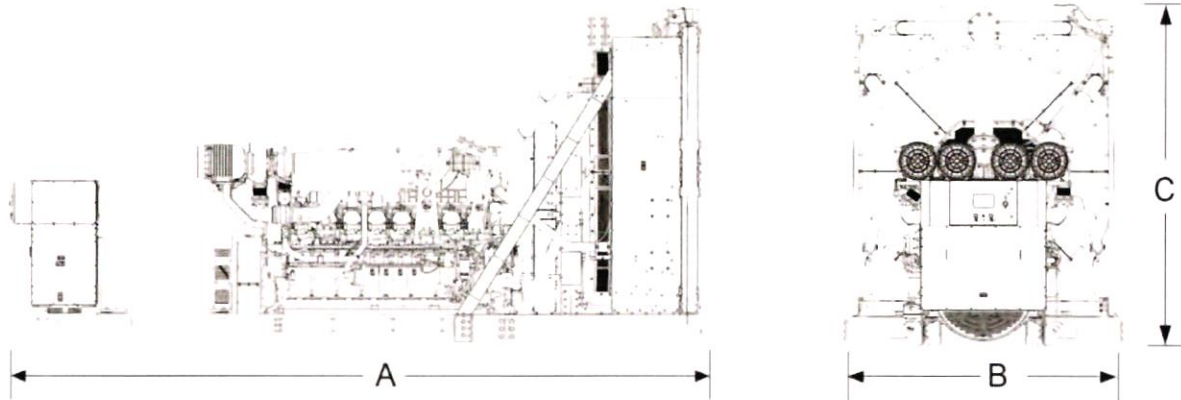
Performance	Mission Critical	
Engine Speed	1800 rpm	
Frequency	60 Hz	
Gen set power rating with fan	3000 ekW	
Gen set power rating with fan @ 0.8 power factor	3750 kVA	
Emissions	Tier 2 (EPA ESE)	
Performance number	EM4718-02	
Fuel Consumption		
100% load with fan – L/hr (gal/hr)	773.2	(204.3)
75% load with fan – L/hr (gal/hr)	624.2	(164.9)
50% load with fan – L/hr (gal/hr)	467.5	(123.5)
25% load with fan – L/hr (gal/hr)	246.4	(65.1)
Cooling System		
Radiator air flow restriction (system) – kPa (in. water)	0.12	(0.48)
Radiator air flow – m³/min (cfm)	3476	(122753)
Engine coolant capacity – L (gal)	179.0	(47.3)
Radiator coolant capacity – L (gal)	255.0	(67.4)
Total coolant capacity – L (gal)	434.0	(114.7)
Inlet Air		
Combustion air inlet flow rate – m³/min (cfm)	246.1	(8690.9)
Exhaust System		
Exhaust stack gas temperature – °C (°F)	483.3	(902.0)
Exhaust gas flow rate – m³/min (cfm)	645.8	(22806.2)
Exhaust system backpressure (maximum allowable) – kPa (in. water)	7.0	(28.1)
Heat Rejection		
Heat rejection to jacket water – kW (Btu/min)	917	(52144)
Heat rejection to exhaust (total) – kW (Btu/min)	3091	(175769)
Heat rejection to aftercooler – kW (Btu/min)	944	(53683)
Heat rejection to atmosphere from engine – kW (Btu/min)	158	(8993)
Heat rejection from alternator – kW (Btu/min)	119	(6739)
Emissions* (Nominal)		
NOx mg/Nm³ (g/hp-h)	2610.4	(5.63)
CO mg/Nm³ (g/hp-h)	305.9	(0.66)
HC mg/Nm³ (g/hp-h)	17.4	(0.04)
PM mg/Nm³ (g/hp-h)	17.6	(0.05)
Emissions* (Potential Site Variation)		
NOx mg/Nm³ (g/hp-h)	3132.5	(6.76)
CO mg/Nm³ (g/hp-h)	550.6	(1.20)
HC mg/Nm³ (g/hp-h)	23.1	(0.06)
PM mg/Nm³ (g/hp-h)	24.6	(0.06)

*mg/Nm³ levels are corrected to 5% O₂. Contact your local Cat dealer for further information.

3516E Diesel Generator Sets High Power Density (HPD) Electric Power



Weights and Dimensions



Standby Rating ekW (kVA)	Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
3000 (3750)	7678 (302.3)	2874 (113.2)	3639 (143.3)	20 380 (44,930)

Note: For reference only. Do not use for installation design. Contact your local Cat dealer for precise weights and dimensions.

Ratings Definitions

Mission Critical

Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the mission critical rated ekW. Typical peak demand up to 100% of rated ekW for up to 5% of the operating time. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Applicable Codes and Standards

AS 1359, ULC 2200 3rd edition, UL 489, UL 869A, IBC, IEC 60034-1, ISO 3046, ISO 8528, NEMA MG1-22, NEMA MG1-33, 2014/35/EU, 2006/42/EC, 2014/30/EU and facilitates compliance to NFPA 37, NFPA 70, NFPA 99, NFPA 110.

Note: Codes may not be available in all model configurations. Please consult your local Cat dealer for availability.

Data Center Applications

- All ratings Tier III/Tier IV compliant per Uptime Institute requirements.
- All ratings ANSI/TIA-942 compliant for Rated-1 through Rated-4 data centers.

Fuel Rates

Fuel consumption reported in accordance with ISO 3046-1, based on fuel oil of 35° API [16°C (60°F)] gravity having an LHV of 42,780 kJ/kg (18,390 Btu/lb) when used at 15°C (59°F) and weighing 850 g/liter (7.0936 lbs/U.S. gal). All fuel consumption values refer to rated engine power.

www.cat.com/electricpower

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Materials and specifications are subject to change without notice.

The International System of Units (SI) is used in this publication.

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PERFORMANCE DATA[EM4718]

May 15, 2025

Performance Number: EM4718

Change Level: 02

SALES MODEL:	3516E	COMBUSTION:	DIRECT INJECTION
BRAND:	CAT	ENGINE SPEED (RPM):	1,800
MACHINE SALES MODEL:		HERTZ:	60
ENGINE POWER (BHP):	4,393	FAN POWER (HP):	154.2
GEN POWER WITH FAN (EKW):	3,000.0	ASPIRATION:	TA
COMPRESSION RATIO:	13.9	AFTERCOOLER TYPE:	ATAAC
RATING LEVEL:	MISSION CRITICAL STANDBY	AFTERCOOLER CIRCUIT TYPE:	JW+OC, ATAAC
PUMP QUANTITY:	1	INLET MANIFOLD AIR TEMP (F):	122
FUEL TYPE:	DIESEL	JACKET WATER TEMP (F):	219.2
MANIFOLD TYPE:	DRY	TURBO CONFIGURATION:	PARALLEL
GOVERNOR TYPE:	ADEM5	TURBO QUANTITY:	4
ELECTRONICS TYPE:	ADEM5	TURBOCHARGER MODEL:	TPX44-H32-CT70-CA50-TT70-TA80
IGNITION TYPE:	CI	CERTIFICATION YEAR:	2020
INJECTOR TYPE:	MEUI-C	CRANKCASE BLOWBY RATE (FT3/HR):	4,390.2
FUEL INJECTOR:	5816980	FUEL RATE (RATED RPM) NO LOAD (GAL/HR):	17.2
UNIT INJECTOR TIMING (IN):	0.88	PISTON SPD @ RATED ENG SPD (FT/MIN):	2,539.4
REF EXH STACK DIAMETER (IN):	12		
MAX OPERATING ALTITUDE (FT):	6,562		

INDUSTRY	SUBINDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET

General Performance Data

THE INLET MANIFOLD AIR TEMP LISTED IN THE HEADER, AND IN THE GENERAL PERFORMANCE DATA, IS THE AVERAGE INLET MANIFOLD TEMP FRONT TO REAR ON THE ENGINE.

THIS STANDBY RATING IS FOR A STANDBY ONLY ENGINE ARRANGEMENT. RERATING THE ENGINE TO A STANDARD PRIME OR CONTINUOUS RATING IS NOT PERMITTED.

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	ISO BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	ISO VOL FUEL CONSUMPTN (VFC)	ELEC SPEC FUEL CONSUMPTN (ESFC)	ISO ELEC SPEC FUEL CONSUMPTN (ESFC)
EKW	%	BHP	PSI	LB/BHP-HR	LB/BHP-HR	GAL/HR	GAL/HR	LB/EKW-HR	LB/EKW-HR
3,000.0	100	4,393	406	0.336	0.330	208.2	204.3	0.492	0.483
2,700.0	90	3,976	367	0.340	0.333	190.3	186.7	0.500	0.491
2,400.0	80	3,557	328	0.349	0.343	175.1	171.7	0.517	0.508
2,250.0	75	3,347	309	0.356	0.349	168.1	164.9	0.530	0.520
2,100.0	70	3,137	290	0.362	0.355	160.2	157.1	0.541	0.531
1,800.0	60	2,716	251	0.370	0.363	141.7	139.0	0.559	0.548
1,500.0	50	2,294	212	0.389	0.382	125.9	123.5	0.595	0.584
1,200.0	40	1,872	173	0.406	0.398	107.2	105.2	0.634	0.622
900.0	30	1,449	134	0.401	0.393	81.8	80.3	0.645	0.633
750.0	25	1,236	114	0.381	0.374	66.4	65.1	0.628	0.616
600.0	20	1,022	94	0.392	0.384	56.4	55.4	0.667	0.655
300.0	10	590	55	0.441	0.433	36.7	36.0	0.869	0.852

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
EKW	%	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
3,000.0	100	4,393	91.7	119.6	1,263.2	61.5	901.9	100	451.3
2,700.0	90	3,976	82.2	119.3	1,247.8	54.4	904.4	90	423.5
2,400.0	80	3,557	74.9	118.9	1,242.3	48.9	913.3	82	403.8
2,250.0	75	3,347	72.1	119.0	1,240.1	46.9	917.3	79	395.9
2,100.0	70	3,137	67.8	119.3	1,240.0	43.8	925.8	74	384.0
1,800.0	60	2,716	56.0	120.2	1,245.9	35.5	953.4	62	348.0
1,500.0	50	2,294	47.1	118.6	1,248.2	29.9	973.6	52	318.8
1,200.0	40	1,872	33.9	114.2	1,255.9	21.9	1,002.7	38	269.7
900.0	30	1,449	16.7	112.4	1,203.6	12.3	984.1	20	191.4
750.0	25	1,236	8.9	110.5	1,091.8	8.1	915.3	11	150.2
600.0	20	1,022	5.8	108.3	1,004.5	6.6	847.7	8	133.3
300.0	10	590	0.9	104.2	780.2	4.2	671.9	3	108.0

General Performance Data (Continued)

GENSET POWER	PERCENT LOAD	ENGINE POWER	WET INLET AIR VOL	ENGINE OUTLET	WET INLET AIR	WET EXH GAS	WET EXH VOL	DRY EXH VOL
--------------	--------------	--------------	-------------------	---------------	---------------	-------------	-------------	-------------

PERFORMANCE DATA[EM4718]

May 15, 2025

WITH FAN			FLOW RATE	WET EXH GAS VOL FLOW RATE	MASS FLOW RATE	MASS FLOW RATE	FLOW RATE (32 DEG F AND 29.98 IN HG)	FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
3,000.0	100	4,393	8,689.8	22,803.0	37,643.0	39,120.1	8,234.2	7,508.7
2,700.0	90	3,976	8,100.6	21,092.5	34,770.1	36,119.8	7,602.7	6,941.1
2,400.0	80	3,557	7,618.2	19,872.8	32,572.6	33,813.7	7,116.5	6,503.0
2,250.0	75	3,347	7,434.9	19,421.7	31,724.7	32,917.4	6,934.8	6,343.9
2,100.0	70	3,137	7,140.4	18,713.3	30,413.9	31,551.3	6,641.0	6,078.0
1,800.0	60	2,716	6,316.6	16,737.0	26,667.4	27,671.7	5,823.4	5,324.6
1,500.0	50	2,294	5,698.5	15,244.3	23,951.1	24,844.2	5,229.6	4,787.6
1,200.0	40	1,872	4,748.1	12,895.5	19,832.8	20,593.5	4,335.7	3,959.7
900.0	30	1,449	3,421.3	9,198.1	14,210.7	14,791.0	3,132.4	2,847.7
750.0	25	1,236	2,813.2	7,143.6	11,655.6	12,126.4	2,554.4	2,323.7
600.0	20	1,022	2,588.4	6,214.7	10,705.5	11,105.8	2,337.3	2,139.1
300.0	10	590	2,189.5	4,545.1	9,126.5	9,387.3	1,974.8	1,838.2

Heat Rejection Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
3,000.0	100	4,393	52,144	8,993	175,769	91,810	23,854	53,683	186,315	447,861	477,084
2,700.0	90	3,976	48,348	8,755	162,671	85,129	21,755	46,560	168,590	408,442	435,094
2,400.0	80	3,557	45,188	8,663	152,310	80,972	19,852	39,923	150,835	372,717	397,037
2,250.0	75	3,347	43,721	8,625	147,003	79,360	18,929	37,161	141,942	355,388	378,578
2,100.0	70	3,137	42,430	8,593	141,837	77,229	18,002	34,024	133,031	337,986	360,040
1,800.0	60	2,716	40,153	8,591	130,286	71,150	16,087	27,442	115,184	302,034	321,742
1,500.0	50	2,294	37,137	8,662	118,761	66,069	14,137	20,821	97,288	265,422	282,742

Emissions Data

PARTICULATE EMISSIONS WERE NOT MEASURED FOR THIS RATING. PUBLISHED PM DATA IS ESTIMATED FROM MEASURED SMOKE METER DATA.

DIESEL

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN	EKW	3,000.0	2,250.0	1,500.0	750.0	300.0
PERCENT LOAD	%	100	75	50	25	10
ENGINE POWER	BHP	4,393	3,347	2,294	1,236	590
TOTAL NOX (AS NO2)	G/HR	24,589	12,160	6,934	8,735	6,302
TOTAL CO	G/HR	2,899	2,470	1,673	2,077	1,535
TOTAL HC	G/HR	190	142	118	84	160
TOTAL CO2	KG/HR	2,097	1,691	1,268	673	371
PART MATTER	G/HR	200.9	249.8	229.1	153.7	16.6
TOTAL NOX (AS NO2) (CORR 5% O2)	MG/NM3	2,610.4	1,597.8	1,214.4	2,955.6	3,548.5
TOTAL CO (CORR 5% O2)	MG/NM3	305.9	319.2	290.7	686.3	917.4
TOTAL HC (CORR 5% O2)	MG/NM3	17.4	16.0	17.7	24.0	84.5
PART MATTER (CORR 5% O2)	MG/NM3	17.6	27.2	33.4	41.1	11.3
TOTAL NOX (AS NO2) (CORR 15% O2)	MG/NM3	968.6	592.9	450.6	1,096.7	1,316.7
TOTAL CO (CORR 15% O2)	MG/NM3	113.5	118.5	107.9	254.7	340.4
TOTAL HC (CORR 15% O2)	MG/NM3	6.4	5.9	6.6	8.9	31.4
PART MATTER (CORR 15% O2)	MG/NM3	6.5	10.1	12.4	15.3	4.2
TOTAL NOX (AS NO2) (CORR 5% O2)	PPM	1,272	778	592	1,440	1,728
TOTAL CO (CORR 5% O2)	PPM	245	255	233	549	734
TOTAL HC (CORR 5% O2)	PPM	32	30	33	45	158
TOTAL NOX (AS NO2) (CORR 15% O2)	PPM	472	289	219	534	641
TOTAL CO (CORR 15% O2)	PPM	91	95	86	204	272
TOTAL HC (CORR 15% O2)	PPM	12	11	12	17	59
TOTAL NOX (AS NO2)	G/HP-HR	5.63	3.65	3.03	7.07	10.68
TOTAL CO	G/HP-HR	0.66	0.74	0.73	1.68	2.60
TOTAL HC	G/HP-HR	0.04	0.04	0.05	0.07	0.27

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PART MATTER	G/HP-HR	0.05	0.07	0.10	0.12	0.03
TOTAL NOX (AS NO2)	G/KW-HR	7.66	4.96	4.12	9.61	14.53
TOTAL CO	G/KW-HR	0.90	1.01	0.99	2.29	3.54
TOTAL HC	G/KW-HR	0.06	0.06	0.07	0.09	0.37
PART MATTER	G/KW-HR	0.06	0.10	0.14	0.17	0.04
TOTAL NOX (AS NO2)	LB/HR	54.21	26.81	15.29	19.26	13.89
TOTAL CO	LB/HR	6.39	5.44	3.69	4.58	3.38
TOTAL HC	LB/HR	0.42	0.31	0.26	0.18	0.35
TOTAL CO2	LB/HR	4.623	3.728	2.794	1.484	819
PART MATTER	LB/HR	0.44	0.55	0.51	0.34	0.04
OXYGEN IN EXH	%	8.9	9.4	9.5	8.5	12.0
DRY SMOKE OPACITY	%	2.0	2.6	2.9	4.3	0.2
BOSCH SMOKE NUMBER		0.86	0.96	1.02	1.16	0.70

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN	EKW	3,000.0	2,250.0	1,500.0	750.0	300.0
PERCENT LOAD	%	100	75	50	25	10
ENGINE POWER	BHP	4,393	3,347	2,294	1,236	590
TOTAL NOX (AS NO2)	G/HR	29,507	14,592	8,321	10,482	7,562
TOTAL CO	G/HR	5,219	4,446	3,012	3,738	2,763
TOTAL HC	G/HR	253	188	157	111	213
PART MATTER	G/HR	281.2	349.8	320.7	215.1	23.3
TOTAL NOX (AS NO2) (CORR 5% O2)	MG/NM3	3,132.5	1,917.4	1,457.3	3,546.7	4,258.2
TOTAL CO (CORR 5% O2)	MG/NM3	550.6	574.6	523.3	1,235.4	1,651.3
TOTAL HC (CORR 5% O2)	MG/NM3	23.1	21.3	23.6	31.9	112.4
PART MATTER (CORR 5% O2)	MG/NM3	24.6	38.1	46.7	57.6	15.8
TOTAL NOX (AS NO2) (CORR 15% O2)	MG/NM3	1,162.4	711.5	540.8	1,316.1	1,580.1
TOTAL CO (CORR 15% O2)	MG/NM3	204.3	213.2	194.2	458.4	612.8
TOTAL HC (CORR 15% O2)	MG/NM3	8.6	7.9	8.8	11.8	41.7
PART MATTER (CORR 15% O2)	MG/NM3	9.1	14.1	17.3	21.4	5.9
TOTAL NOX (AS NO2) (CORR 5% O2)	PPM	1,526	934	710	1,728	2,074
TOTAL CO (CORR 5% O2)	PPM	441	460	419	988	1,321
TOTAL HC (CORR 5% O2)	PPM	43	40	44	60	210
TOTAL NOX (AS NO2) (CORR 15% O2)	PPM	566	347	263	641	770
TOTAL CO (CORR 15% O2)	PPM	163	171	155	367	490
TOTAL HC (CORR 15% O2)	PPM	16	15	16	22	78
TOTAL NOX (AS NO2)	G/HP-HR	6.76	4.38	3.64	8.49	12.82
TOTAL CO	G/HP-HR	1.20	1.33	1.32	3.03	4.68
TOTAL HC	G/HP-HR	0.06	0.06	0.07	0.09	0.36
PART MATTER	G/HP-HR	0.06	0.10	0.14	0.17	0.04
TOTAL NOX (AS NO2)	G/KW-HR	9.19	5.95	4.94	11.54	17.43
TOTAL CO	G/KW-HR	1.63	1.81	1.79	4.11	6.37
TOTAL HC	G/KW-HR	0.08	0.08	0.09	0.12	0.49
PART MATTER	G/KW-HR	0.09	0.14	0.19	0.24	0.05
TOTAL NOX (AS NO2)	LB/HR	65.05	32.17	18.34	23.11	16.67
TOTAL CO	LB/HR	11.51	9.80	6.64	8.24	6.09
TOTAL HC	LB/HR	0.56	0.42	0.35	0.25	0.47
PART MATTER	LB/HR	0.62	0.77	0.71	0.47	0.05

Regulatory Information

EPA EMERGENCY STATIONARY			2011 - ----	
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE EMERGENCY STATIONARY REGULATIONS.				
Locality U.S. (INCL CALIF)	Agency EPA	Regulation STATIONARY	Tier/Stage EMERGENCY STATIONARY	Max Limits - G/BKW - HR CO: 3.5 NOx + HC: 6.4 PM: 0.20

Altitude Derate Data

A BLANK IN THE ALTITUDE DERATE TABLE SIGNIFIES THAT NO RATING IS AVAILABLE AT THAT SPECIFIED ALTITUDE AND AMBIENT TEMPERATURE.

THE TEMPERATURES LISTED IN THE CHART ARE AMBIENT TEMPERATURES. THE FOLLOWING DERATE CHART WAS CALCULATED ASSUMING A 5 DEG C RISE IN AIR TEMPERATURE BETWEEN AMBIENT AND THE TURBOCHARGER INLET.

STANDARD

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	30	40	50	60	70	80	90	100	110	120	130	140	NORMAL
ALTITUDE (FT)													
0	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,393	1,927		4,393
1,000	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,393	1,860		4,393
2,000	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,304		4,393
3,000	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,313	2,786			4,393
4,000	4,393	4,393	4,393	4,393	4,393	4,393	4,393	4,355	4,037	1,625			4,393
5,000	4,393	4,393	4,393	4,393	4,393	4,383	4,334	4,221	3,517				4,393
6,000	4,393	4,393	4,393	4,356	4,307	4,246	4,183	4,064	2,023				4,393
7,000	4,393	4,380	4,306	4,226	4,160	4,072	3,968	3,778					4,378
8,000	4,347	4,247	4,153	4,051	3,974	3,836	3,573	3,093					4,274
9,000	4,203	4,068	3,954	3,831	3,738	3,550	3,208	2,621					4,152
10,000	3,990	3,831	3,691	3,541	3,442	3,250	2,968	2,196					3,986
11,000	3,755	3,560	3,390	3,239	3,162	3,018	2,762	1,678					3,815
12,000	3,413	3,252	3,123	3,015	2,940	2,762	2,300	1,104					3,539
13,000	3,070	2,977	2,897	2,829	2,750	2,477	1,702						3,198
14,000	2,754	2,728	2,691	2,660	2,553	2,240							2,841
15,000	2,454	2,461	2,285	2,143	2,057	1,713							2,523

Cross Reference

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
5643812	LL2329	5577462	PG296	-	ZNL00001	

Supplementary Data

Type	Classification	Performance Number
ALTITUDE DATA	HIGH RESOLUTION	EM5585

Performance Parameter Reference

Parameters Reference:DM9600-15
PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600

APPLICATION:

Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS:

Power +/- 3%

Torque +/- 3%

Exhaust stack temperature +/- 8%

Inlet airflow +/- 5%

Intake manifold pressure-gage +/- 10%

Exhaust flow +/- 6%

Specific fuel consumption +/- 3%

Specific fuel consumption (C7-C18) +/- 4%

Fuel rate +/- 5%

Specific DEF consumption +/- 3%

DEF rate +/- 5%

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Heat rejection +/- 5%

Heat rejection exhaust only +/- 10%

Heat rejection CEM only +/- 10%

Heat Rejection values based on using treated water.

Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.

On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.

On 3500 and C175 engines, at speeds below Peak Torque these values are provided for reference only, and may not meet the tolerance listed.

These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS:

Heat rejection +/- 10%

Heat rejection to Atmosphere +/- 50%

Heat rejection to Lube Oil +/- 20%

Heat rejection to Aftercooler +/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS:

Torque +/- 0.5%

Speed +/- 0.2%

Fuel flow +/- 1.0%

Temperature +/- 2.0 C degrees

Intake manifold pressure +/- 0.1 kPa

OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE

AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR

FOR 3500 ENGINES AND SMALLER

SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.

FOR 3600 ENGINES

Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE

Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER

The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL

DIESEL

Reference fuel is #2 distillate diesel with a 35API gravity;

A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 15 deg C (59 deg F), where the density is 850 G/Liter (7.0936 Lbs/Gal).

GAS

Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS

EXTERNAL AUXILIARY LOAD

Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY

Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set.

Standard temperature values versus altitude could be seen on TM2001.

When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.

Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values

PERFORMANCE DATA[EM4718]

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defined, see TM2001.

Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE

TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.

Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

EMISSION CYCLE LIMITS:

Cycle emissions Max Limits apply to cycle-weighted averages only. Emissions at individual load points may exceed the cycle-weighted limit.

WET & DRY EXHAUST/EMISSIONS DESCRIPTION:

Wet - Total exhaust flow or concentration of total exhaust flow

Dry - Total exhaust flow minus water vapor or concentration of exhaust flow with water vapor excluded

EMISSIONS DEFINITIONS:

Emissions : DM1176

EMISSION CYCLE DEFINITIONS

1. For constant-speed marine engines for ship main propulsion, including diesel-electric drive, test cycle E2 shall be applied, for controllably-pitch propeller sets
test cycle E2 shall be applied.

2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.

3. For constant-speed auxiliary engines test cycle D2 shall be applied.

4. For variable-speed, variable-load auxiliary engines, not included above, test cycle C1 shall be applied.

HEAT REJECTION DEFINITIONS:

Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS:

3500: EM1500

RATING DEFINITIONS:

Agriculture : TM6008

Fire Pump : TM6009

Generator Set : TM6035

Generator (Gas) : TM6041

Industrial Diesel : TM6010

Industrial (Gas) : TM6040

Irrigation : TM5749

Locomotive : TM6037

Marine Auxiliary : TM6036

Marine Prop (Except 3600) : TM5747

Marine Prop (3600 only) : TM5748

MSHA : TM6042

Oil Field (Petroleum) : TM6011

Off-Highway Truck : TM6039

On-Highway Truck : TM6038

SOUND DEFINITIONS:

Sound Power : DM8702

Sound Pressure : TM7080

Date Released : 03/12/24

Engine Parameters					
Engine Manufacturer	Caterpillar			Raw Emissions	
Engine Model	3516E			NOx	6.76 g/bhp-hr
Engine Power	4393	bhp		CO	1.20 g/bhp-hr
Exhaust Flowrate	39120	lb/hr		THC	0.06 g/bhp-hr
Exhaust Temperature	902	° F		PM	0.06 g/bhp-hr
Load	100%			Oxygen	8.9 %
Fuel	Diesel				
Engine Data Sheet	3516E_3.0MW_EM4718-02_Perf Data_E.pdf				

System Performance					
Guaranteed Emissions for EPA Tier IV Compliance (6)			Expected Backpressure		
NOx	0.34	g/bhp-hr	Fresh	17.76	inches of water
CO	0.13	g/bhp-hr	DPF Fully Loaded	25.64	inches of water
THC	0.05	g/bhp-hr			
PM	0.02	g/bhp-hr	Required Utilities		
Attenuation	35 - 45	dBA	Urea Flow Rate	15.10	gal/hr

Cat® C32

Diesel Generator Sets



Image shown may not reflect actual configuration

Bore – mm (in)	145 (5.7)
Stroke – mm (in)	162 (6.4)
Displacement – L (in³)	32.1 (1959)
Compression Ratio	14.0:1
Aspiration	TA
Fuel System	EUI
Governor Type	ADEM™ A4

Standby 60 Hz kW (kVA)	Mission Critical 60 Hz kW (kVA)	Prime 60 Hz kW (kVA)	Emissions Performance
1100 (1375.0)	1100 (1375.0)	1000 (1250.0)	U.S. EPA Emergency Stationary Use Only (Tier 2)
1250 (1562.5)	1250 (1562.5)	1136 (1420.0)	

Standard Features

Cat® Diesel Engine

- Designed and tested to meet the U.S. EPA Emergency Stationary Use Only (Tier 2) emission standards
- Reliable and consistent performance proven in thousands of applications worldwide

Generator Set Package

- Accepts 100% block load in one step and meets NFPA 110 loading requirements
- Conforms to ISO 8528-5 G3 load acceptance requirements
- Reliability is verified through prototype testing, which includes torsional vibration, fuel consumption, oil consumption, transient performance, and endurance testing

Alternators

- Superior motor starting capability minimizes the need for oversizing the generator
- Designed to match the performance and output characteristics of Cat diesel engines

Cooling System

- Cooling systems available to operate in ambient temperatures up to 50°C (122°F)
- Tested to ensure proper generator set cooling

EMCP 4 Control Panels

- User-friendly interface and navigation
- Scalable system to meet a wide range of installation requirements
- Expansion modules and site specific programming for specific customer requirements

Warranty

- 24 months/1000-hour warranty for standby and mission critical ratings
- 12 months/unlimited hour warranty for prime and continuous ratings
- Extended service protection is available to provide extended coverage options

Worldwide Product Support

- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- Your local Cat dealer provides extensive post-sale support, including maintenance and repair agreements

Financing

- Caterpillar offers an array of financial products to help you succeed through financial service excellence
- Options include loans, finance lease, operating lease, working capital, and revolving line of credit
- Contact your local Cat dealer for availability in your region

Optional Equipment

Engine

Air Cleaner

- ☐ Single element
- ☐ Dual element
- ☐ Heavy duty

Muffler

- ☐ Industrial grade (15 dB)

Starting

- ☐ Standard batteries
- ☐ Oversized batteries
- ☐ Standard electric starter
- ☐ Dual duty electric starter
- ☐ Jacket water heater

Alternator

Output voltage

- ☐ 220V ☐ 440V
- ☐ 240V ☐ 480V
- ☐ 380V ☐ 600V
- ☐ 400V

Temperature Rise (over 40°C ambient)

- ☐ 150°C
- ☐ 125°C/130°C
- ☐ 105°C
- ☐ 80°C

Winding type

- ☐ Random wound
- ☐ Form wound

Excitation

- ☐ Self excited
- ☐ Internal excitation (IE)
- ☐ Permanent magnet (PM)

Attachments

- ☐ Anti-condensation heater
- ☐ Stator and bearing temperature monitoring and protection

Power Termination

Type

- ☐ Bus bar
- ☐ Circuit breaker
- ☐ 400A ☐ 800A
- ☐ 1200A ☐ 1600A
- ☐ 2000A ☐ 2500A
- ☐ 3000A ☐ 3200A
- ☐ UL ☐ IEC
- ☐ 3-pole ☐ 4-pole
- ☐ Manually operated
- ☐ Electrically operated

Trip Unit

- ☐ LSI ☐ LSI-G
- ☐ LSIG-P

Factory Enclosure

- ☐ Weather protective
- ☐ Sound attenuated

Attachments

- ☐ Cold weather bundle
- ☐ DC lighting package
- ☐ AC lighting package
- ☐ Motorized louvers

Fuel Tank

- ☐ Sub-base
- ☐ 1000 gal (3875 L)
- ☐ 2000 gal (7570 L)
- ☐ 3600 gal (13627 L)

Control System

Controller

- ☐ EMCP 4.2B
- ☐ EMCP 4.3
- ☐ EMCP 4.4

Attachments

- ☐ Local annunciator module
- ☐ Remote annunciator module
- ☐ Expansion I/O module
- ☐ Remote monitoring software

Charging

- ☐ Battery charger – 10A

Vibration Isolators

- ☐ Rubber
- ☐ Spring
- ☐ Seismic rated

Cat Connect

Connectivity

- ☐ Ethernet
- ☐ Cellular
- ☐ Satellite

Extended Service Options

Terms

- ☐ 2 year (prime)
- ☐ 3 year
- ☐ 5 year
- ☐ 10 year

Coverage

- ☐ Silver
- ☐ Gold
- ☐ Platinum
- ☐ Platinum Plus

Ancillary Equipment

- ☐ Automatic transfer switch (ATS)
- ☐ Uninterruptible power supply (UPS)
- ☐ Paralleling switchgear
- ☐ Paralleling controls

Certifications

- ☐ UL 2200 Listed
- ☐ CSA
- ☐ IBC seismic certification
- ☐ OSHPD pre-approval

Note: Some options may not be available on all models. Certifications may not be available with all model configurations. Consult factory for availability.

Package Performance

Performance	Standby		Mission Critical		Prime	
Frequency	60 Hz		60 Hz		60 Hz	
Gen set power rating with fan	1250 ekW		1250 ekW		1136 ekW	
Gen set power rating with fan @ 0.8 power factor	1562.5 kVA		1562.5 kVA		1420.0 kVA	
Emissions	EPA ESE (Tier 2)		EPA ESE (Tier 2)		EPA ESE (Tier 2)	
Performance number	EM2324-09		EM2532-03		EM2538-01	
Fuel Consumption						
100% load with fan – L/hr (gal/hr)	330.9	(87.4)	330.9	(87.4)	306.6	(81.0)
75% load with fan – L/hr (gal/hr)	268.9	(71.0)	269.1	(71.1)	241.4	(63.8)
50% load with fan – L/hr (gal/hr)	181.1	(47.8)	181.3	(47.9)	167.5	(44.3)
25% load with fan – L/hr (gal/hr)	102.1	(27.0)	102.3	(27.0)	94.7	(25.0)
Cooling System						
Radiator air flow restriction (system) – kPa (in. water)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)
Radiator air flow – m³/min (cfm)	1432	(50571)	1432	(50571)	1432	(50571)
Engine coolant capacity – L (gal)	55.0	(14.5)	55.0	(14.5)	55.0	(14.5)
Radiator coolant capacity – L (gal)	55.0	(14.5)	55.0	(14.5)	55.0	(14.5)
Total coolant capacity – L (gal)	110	(29.0)	110	(29.0)	110	(29.0)
Inlet Air						
Combustion air inlet flow rate – m³/min (cfm)	118.0	(4168.3)	118.0	(4168.3)	114.4	(4039.9)
Exhaust System						
Exhaust stack gas temperature – °C (°F)	430.3	(806.6)	430.3	(806.6)	420.1	(788.2)
Exhaust gas flow rate – m³/min (cfm)	283.4	(10005.8)	283.4	(10005.8)	270.7	(9558.9)
Exhaust system backpressure (maximum allowable) – kPa (in. water)	6.7	(27.0)	6.7	(27.0)	6.7	(27.0)
Heat Rejection						
Heat rejection to jacket water – kW (Btu/min)	403	(22908)	403	(22908)	390	(22199)
Heat rejection to exhaust (total) – kW (Btu/min)	1097	(62361)	1097	(62361)	1053	(59888)
Heat rejection to aftercooler – kW (Btu/min)	452	(25715)	452	(25715)	433	(24627)
Heat rejection to atmosphere from engine – kW (Btu/min)	222	(12620)	222	(12620)	209	(11880)
Heat rejection from alternator – kW (Btu/min)	58.9	(3350)	58.9	(3350)	52.2	(2969)
Emissions* (Nominal)						
NOx mg/Nm³ (g/hp-h)	2416.9	(5.13)	2416.9	(5.13)	2127.0	(4.58)
CO mg/Nm³ (g/hp-h)	53.0	(0.11)	53.0	(0.11)	40.4	(0.09)
HC mg/Nm³ (g/hp-h)	21.6	(0.05)	21.6	(0.05)	22.2	(0.06)
PM mg/Nm³ (g/hp-h)	5.1	(0.01)	5.1	(0.01)	6.8	(0.02)
Emissions* (Potential Site Variation)						
NOx mg/Nm³ (g/hp-h)	2924.5	(6.20)	2924.5	(6.20)	2573.7	(5.54)
CO mg/Nm³ (g/hp-h)	99.1	(0.21)	99.1	(0.21)	75.5	(0.16)
HC mg/Nm³ (g/hp-h)	40.8	(0.10)	40.8	(0.10)	42.0	(0.10)
PM mg/Nm³ (g/hp-h)	10.0	(0.02)	10.0	(0.02)	13.2	(0.03)

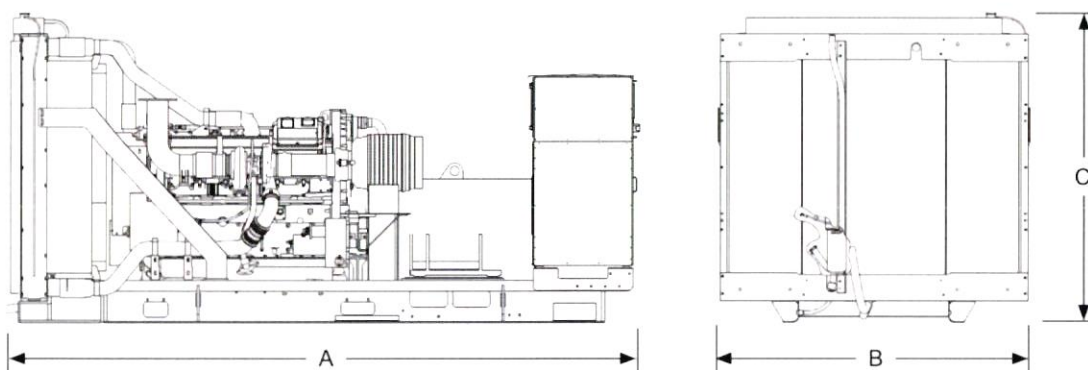
*mg/Nm³ levels are corrected to 5% O₂. Contact your local Cat dealer for further information

Package Performance

Performance	Standby		Mission Critical		Prime	
Frequency	60 Hz		60 Hz		60 Hz	
Gen set power rating with fan	1100 ekW		1100 ekW		1000 ekW	
Gen set power rating with fan @ 0.8 power factor	1375 kVA		1375 kVA		1250 kVA	
Emissions	EPA ESE (Tier 2)		EPA ESE (Tier 2)		EPA ESE (Tier 2)	
Performance number	EM2325-07		EM2533-03		EM2539-01	
Fuel Consumption						
100% load with fan – L/hr (gal/hr)	299.8	(79.2)	299.8	(79.2)	281.2	(74.3)
75% load with fan – L/hr (gal/hr)	232.8	(61.5)	232.8	(61.5)	210.6	(55.6)
50% load with fan – L/hr (gal/hr)	163.2	(43.1)	163.2	(43.1)	151.3	(40.0)
25% load with fan – L/hr (gal/hr)	92.3	(24.4)	92.3	(24.4)	85.4	(22.6)
Cooling System						
Radiator air flow restriction (system) – kPa (in. water)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)
Radiator air flow – m³/min (cfm)	1432	(50571)	1432	(50571)	1432	(50571)
Engine coolant capacity – L (gal)	55.0	(14.5)	55.0	(14.5)	55.0	(14.5)
Radiator coolant capacity – L (gal)	55.0	(14.5)	55.0	(14.5)	55.0	(14.5)
Total coolant capacity – L (gal)	110	(29.0)	110	(29.0)	110	(29.0)
Inlet Air						
Combustion air inlet flow rate – m³/min (cfm)	113.4	(4004.9)	113.4	(4004.9)	110.6	(3905.2)
Exhaust System						
Exhaust stack gas temperature – °C (°F)	417.3	(783.2)	417.3	(783.2)	410.6	(771.1)
Exhaust gas flow rate – m³/min (cfm)	266.9	(9425.0)	266.9	(9425.0)	257.6	(9097.1)
Exhaust system backpressure (maximum allowable) – kPa (in. water)	6.7	(27.0)	6.7	(27.0)	6.7	(27.0)
Heat Rejection						
Heat rejection to jacket water – kW (Btu/min)	385	(21898)	385	(21898)	367	(20867)
Heat rejection to exhaust (total) – kW (Btu/min)	1036	(58923)	1036	(58923)	981	(55782)
Heat rejection to aftercooler – kW (Btu/min)	424	(24138)	424	(24138)	394	(22416)
Heat rejection to atmosphere from engine – kW (Btu/min)	204	(11618)	204	(11618)	190	(10824)
Heat rejection from alternator – kW (Btu/min)	54.2	(3082)	54.2	(3082)	49.3	(2804)
Emissions* (Nominal)						
NOx mg/Nm³ (g/hp-h)	2018.8	(4.38)	2018.8	(4.38)	1717.3	(3.83)
CO mg/Nm³ (g/hp-h)	37.4	(0.08)	37.4	(0.08)	41.4	(0.09)
HC mg/Nm³ (g/hp-h)	22.5	(0.06)	22.5	(0.06)	23.2	(0.06)
PM mg/Nm³ (g/hp-h)	7.2	(0.02)	7.2	(0.02)	8.3	(0.02)
Emissions* (Potential Site Variation)						
NOx mg/Nm³ (g/hp-h)	2442.7	(5.30)	2442.7	(5.30)	2077.9	(4.63)
CO mg/Nm³ (g/hp-h)	69.9	(0.15)	69.9	(0.15)	77.4	(0.17)
HC mg/Nm³ (g/hp-h)	42.6	(0.11)	42.6	(0.11)	43.9	(0.11)
PM mg/Nm³ (g/hp-h)	14.1	(0.04)	14.1	(0.04)	16.1	(0.04)

*mg/Nm³ levels are corrected to 5% O₂. Contact your local Cat dealer for further information

Weights and Dimensions



Standby 60 Hz ekW (kVA)	Mission Critical 60 Hz ekW (kVA)	Prime 60 Hz ekW (kVA)	Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
1100 (1375.0)	1100 (1375.0)	1000 (1250.0)	4285 (168.7)	2228 (87.7)	2194 (86.4)	7400 (16,314)
1250 (1562.5)	1250 (1562.5)	1136 (1420.0)	4385 (172.7)	2228 (87.7)	2194 (86.4)	7600 (16,755)

Note: For reference only. Do not use for installation design. Contact your local Cat dealer for precise weights and dimensions.

Ratings Definition

Standby

Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Mission Critical

Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the mission critical power rating. Typical peak demand up to 100% of rated power for up to 5% of the operating time. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Prime

Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand is 100% of prime rated kW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year.

Applicable Codes and Standards

AS 1359, CSA C22.2 No. 100-04, UL 142, UL 489, UL 869, UL 2200, NFPA 37, NFPA 70, NFPA 99, NFPA 110, IBC, IEC 60034-1, ISO 3046, ISO 8528, NEMA MG1-22, NEMA MG1-33, 2014/35/EU, 2006/42/EC, 2014/30/EU.

Note: Codes may not be available in all model configurations. Please consult your local Cat dealer for availability.

Data Center Applications

- ISO 8528-1 Data Center Power (DCP) compliant per DCP application of Cat diesel generator set prime power rating.
- All ratings Tier III/Tier IV compliant per Uptime Institute requirements.
- All ratings ANSI/TIA-942 compliant for Rated-1 through Rated-4 data centers.

Fuel Rates

Fuel rates are based on fuel oil of 35° API [16°C (60°F)] gravity having an LHV of 42,780 kJ/kg (18,390 Btu/lb) when used at 29°C (85°F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.)

www.cat.com/electricpower

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Materials and specifications are subject to change without notice.
The International System of Units (SI) is used in this publication.



Engine Selection | De-rate Calculator | Speed Interpolator

USA Purchased, PLD, Export

Date 2/19/2026 Log Number 147788

Type Clarke Engine Enclosure: None

Pump Requirements Pump Max Power: 415 BHP
RPM(s): 2100

Derate Parameters Altitude: 4500 feet
Ambient Temperature: 77° F
Right Angle Gear Loss: 0%
Derate Percent: 12.6%

Application Information Customer:
Job Name:
Job Number:
Run By:

No engines match the selection criteria given.

Alternate NSPS Certified engine selections:

Model	RPM	Rated BHP (kW)	Ventilation Fan Loss BHP (kW)	Available BHP (kW)	Derate BHP (kW)	Interpolation Data (RPM, BHP)	EPA Emission Tier	Emission Data Available
C18H0-UFAD12-D	2100	488 (364)	-	-	426.5 (318.1)	Not Used	NSPS Tier 3-Certified	No

Note: Derated BHP takes into account all the input derates for altitude, temperature and right angle gearbox. When no derates are input, this column will be blank and engine selection(s) will be based upon rated BHP. When the Derated BHP column is filled in, then the engine selection(s) are based upon this value. These derates are based on NFPA 20 standard.

Definitions: **UL/FM** - Engine that is Underwriters Laboratories Listed and Factory Mutual Approved.
LPCB - Engine that is Loss Prevention Council Board Approved
NL - Non-Listed Engine has no private agency certification, like UL, or insurance company certification, like FM. It applies to any engine that is not UL Listed or FM Approved, and is built to meet individual European country specifications.



C18H0 MODELS

UFAD12 UFAD22 UFAD32
UFAD42

UL/FM - cUL APPROVED RATINGS BHP/kW

C18H0 MODEL	RATED SPEED							
	1470		1760		1900		2100	
UFAD12-D	450	335	460	343	488	364	488	364
FMAD12-S*	450	335	460	343	488	364	488	364
FMAD12-DS*	450	335	460	343	488	364	488	364
UFAD22-D	475	354	510	380	525	392	525	392
FMAD22-S*	475	354	510	380	525	392	525	392
FMAD22-DS*	475	354	510	380	525	392	525	392
UFAD32-D	491	366	542	404	556	414	556	414
FMAD32-S*	491	366	542	404	556	414	556	414
FMAD32-DS*	491	366	542	404	556	414	556	414
UFAD42-D	570	425	614	458	618	460	618	460
FMAD42-S*	570	425	614	458	618	460	618	460
FMAD42-DS*	570	425	614	458	618	460	618	460

All Models are EPA Tier 3 Certified.

♦ All Models are available for export and suitable for installations in the US and US territories.

* -S Suction and -DS Discharge & Suction PLD Engine Models are Factory Mutual (FM) Only

Note 1: PLD-D Use the Clarke PLD-D Calculator on www.clarkefire.com to verify if the Clarke PLD-D will work in your specific application. To order a PLD-D engine, you must submit the PLD-D discharge pressure set point and a copy of the PLD-D calculator results. Discharge (-D) set point pressure can be factory set between 100-350 psi.

Note 2: PLD-S Use the Clarke PLD-D Calculator on www.clarkefire.com to verify the flow requirements for the PLD-S to reach the pressure suction set point, enabling the PLD-S engine to adjust speed and maintain suction pressure. To order a PLD-S engine, you must submit a copy of the PLD-S calculator results. Suction (-S) set point pressure can be factory set between 8-30 psi.

Note 3: PLD-DS Engine orders with both Discharge (-D) and Suction (-S) control must include a copy of both the PLD-D and PLD-S calculator results.



Image shown represents a C18H0 NSR with TSP-E Dual Turbo model

ENGINE SPECIFICATIONS

Number of Cylinders	6
Aspiration	TRWA
Rotation*	CW
Overall Dimensions - in. (mm)	66.1(1678) H X 79.6(2022) L X 45.2(1147) W
Crankshaft Centerline Height - in. (mm)	17.0 (432)
Weight - lb (kg)	4100 (1860)
Compression Ratio	16.3:1
Displacement - cu. in. (l)	1104 (18.1)
Engine Type	4 Stroke Cycle - Inline Construction

Abbreviations: TRWA - Turbocharged and Raw Water Aftercooled CW - Clockwise

*Rotation viewed from Heat Exchanger / Front of engine

CERTIFIED POWER RATING

- Each engine is factory tested to verify power and performance
- FM-UL power ratings are shown at specific speeds. Clarke engines can be applied at a single rated RPM setting +/- 50 RPM.



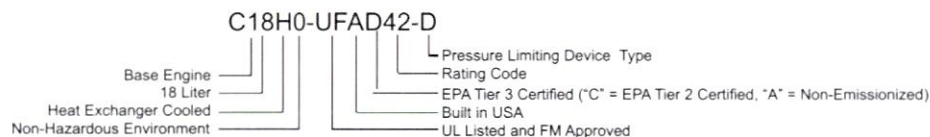
ENGINE RATINGS BASELINES

- Engines are to be used for stationary emergency standby fire pump service only. Engines are to be tested in accordance with NFPA 25.
- Engines are rated at standard SAE conditions of 29.61 in. (752.1 mm) 77°F (25°C) inlet air temperature [approximates 300 ft. (91.4 m) above sea level] by the testing laboratory (see SAE Standard J 1349).
- A deduction of 3 percent from engine horsepower rating at standard SAE conditions shall be made for diesel engines for each 1000 ft. (305 m) altitude above 300 ft. (91.4 m)
- A deduction of 1 percent from engine horsepower rating as corrected to standard SAE conditions shall be made for diesel engines for every 10°F (5.6°C) above 77°F (25°C) ambient temperature.

**C18H0 MODELS**UFAD12 UFAD22 UFAD32
UFAD42**ENGINE EQUIPMENT**

EQUIPMENT	STANDARD	OPTIONAL
Air Cleaner with Air Differential Gauge	Direct Mounted, Washable, Indoor Service with Drip Shield	Disposable, Drip Proof, Indoor Service Outdoor Type, Single or Two Stage
Alarm	Overspeed Alarm & Shutdown, Low Oil Pressure, Low & High Coolant Temperature, Low Raw Water Flow, High Raw Water Temperature, Alternate ECM Warning, Fuel Injection Malfunction, ECM Warning and Failure with Automatic Switching	Low Coolant Level, Low Oil Level, Oil Filter Differential Pressure, Fuel Filter Differential Pressure, Air Filter Restriction
Alternator	24V-DC, 50 Amps with V-Belt and Guard	
Coupling	Bare Flywheel	Driveshaft and Guard
Crankcase Ventilation		Crankcase Breather
Engine Heater	230V-AC, 3500 Watt	
Exhaust Flex Connection	SS Flex, 150# ANSI Flanged Connection. 8"	SS Flex, 150# ANSI Flanged Connection. 10"
Exhaust Protection	Metal Guard on Manifold and Turbochargers	
Flywheel Housing	SAE #1	
Flywheel Power Take Off	14" SAE Industrial Flywheel Connection	
Fuel Connections	Fire Resistent Supply and Return Lines	SS, Braided, cUL Listed, Supply and Return Lines
Fuel Filter	Primary Filter / Water Separator with Priming Pump, Secondary Filter	
Fuel Injection System	Unit Injector	
Governor, Speed	Electronic, Dual Electronic Engine Control Modules	
Heat Exchanger	Serviceable Shell and Tube Type, 60 PSI (4 Bar), NPT (F) Connections, Fresh Water Only	Serviceable 90/10 CuNi Sea Water Compatible (Provided with optional sea water, 316 stainless steel or 90/10 CuNi cooling loop)
Instrument Panel	Standard NEMA Type 4 (IP66) touch screen panel with digital tachometer, hour meter, water temperature, oil pressure and voltmeter gauges. Front Opening. <i>Note: Some models may include powerview display in place of TSP-E</i>	Stainless Steel NEMA Type 4X (IP66) touch screen panel with digital tachometer, hour meter, water temperature, oil pressure and voltmeter gauges. Front Opening.
Junction Box	Integral with Instrument Panel; For DC Wiring Interconnection to Engine Controller	
Lube Oil Cooler	Jacket Water Cooled, Shell and Tube Type	
Lube Oil Filter	Full Flow, Dual Element	
Lube Oil Pump	Gear Driven, Gear Type	
Manual Start Control	Dual Manual Start Contactors & On Instrument Panel with Control Position Warning Light	
Overspeed Control	Electronic, Factory Set	
Raw Water Cooling Loop w/ Alarms	Galvanized	Seawater, All 316 SS, High Pressure
Raw Water Solenoid Operation	Automatic from Fire Pump Controller and from Engine Instrument Panel (for Horizontal Fire Pump Applications)	
Run - Stop Control	On Instrument Panel with Control Position Warning Light	
Starters	One (1) 24V-DC	
Throttle Control	Adjustable Speed Control by Increase/Decrease Button, Tamper Proof Adjustable Speed Control	
Water Pump	Centrifugal Type, Gear Driven	

Abbreviations: DC - Direct Current, AC - Alternating Current, SAE - Society of Automotive Engineers, BSP(F) - British Standard Pipe Thread (Female), SS - Stainless Steel

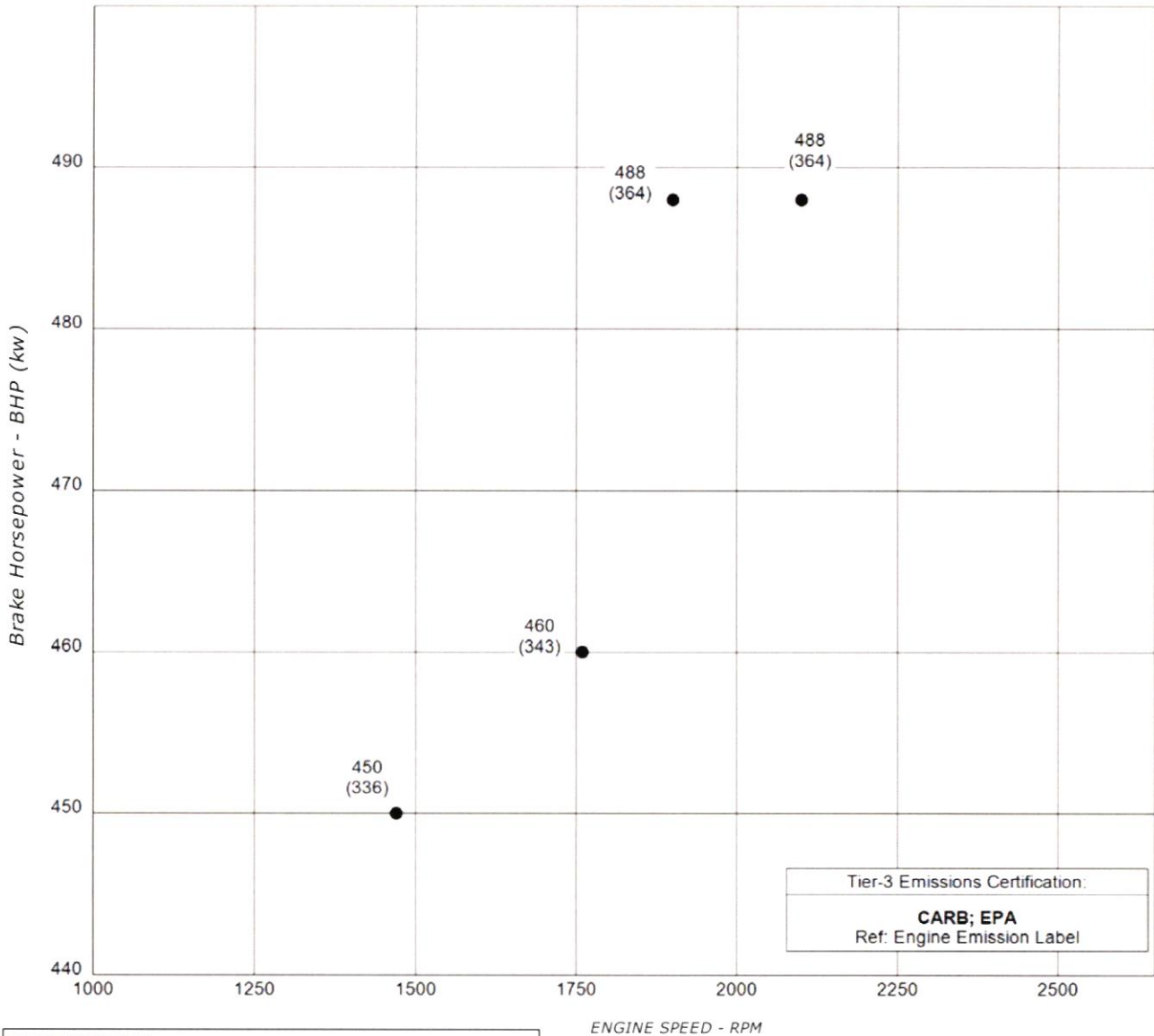
MODEL NOMENCLATURE (11 Digit Models)

Specifications and information contained in this brochure is subject to change without notice.

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CLARKE®

FIRE PUMP MODEL: C18H0-UFAD12
Heat Exchanger Cooled/Turbocharged
Raw Water Charge Cooling
18 Liter, 6 Cylinder



RESTRICTED:

Use only for Stand-By Fire Pump Applications

ENGINE PERFORMANCE:

STANDARD CONDITIONS: (SAE J1349, ISO 3046)
77°F (25°C) AIR INLET TEMPERATURE
29.61 IN. (752.1MM) HG BAROMETRIC PRESSURE
#2 DIESEL FUEL (SEE C130902)

Cory Robbins 11MAY19

ENGINE SPEED - RPM

NAMEPLATE BHP (MAXIMUM PUMP LOAD)

1760, 1900, & 2100 SPEED RATINGS AVAILABLE AS VARIABLE SPEED PLD ONLY

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CREATED

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DATE CREATED

12/02/19

ENGINE MODEL C18H0-UFAD12

DRAWING NO.

C137955

REV

B

Basic Engine Description

Engine Manufacturer	Caterpillar
Ignition Type	Compression (Diesel)
Number of Cylinders	6
Bore and Stroke - in (mm)	5.71 (145) X 7.2 (183)
Displacement - in ³ (L)	1106 (18.1)
Compression Ratio	16.3:1
Valves per cylinder	
Intake	2
Exhaust	2
Combustion System	Direct Injection
Engine Type	In-Line, 4 Stroke Cycle
Fuel Management Control	Electronic, Unit Injector
Firing Order (CW Rotation)	1-5-3-6-2-4
Aspiration	Turbocharged
Charge Air Cooling Type	Raw Water Cooled
Rotation, viewed from front of engine, Clockwise (CW)	Standard
Engine Crankcase Vent System	Open
Installation Drawing	D857
Weight - lb (kg)	4100 (1860)

Power Rating

	1470	1760	1900	2100
Nameplate Power - HP (kW) ¹	450 (336)	460 (343)	488 (364)	488 (364)

Cooling System

	1470	1760	1900	2100
Engine Coolant Heat - Btu/sec (kW)	165 (174)	192 (203)	202 (213)	232 (245)
Engine Radiated Heat - Btu/sec (kW)	50 (52.8)	41 (43.3)	43 (45.4)	57 (60.1)
Heat Exchanger (Brazed Non-Removeable Bundle) Minimum Flow - [C051389]				
60°F (15°C) Raw H ₂ O - gal/min (L/min)	16 (60.6)	18 (68.1)	20 (75.7)	23 (87.1)
100°F (37°C) Raw H ₂ O - gal/min (L/min)	22 (83.3)	24 (90.8)	26 (98.4)	31 (117)
Heat Exchanger (Brazed Non-Removeable Bundle) Maximum Cooling Raw Water - [C051389]				
Inlet Pressure - psi (bar)	60 (4.1)			
Flow - gal/min (L/min)	190 (719)			
Heat Exchanger (NSR Standard Removable Bundle) Minimum Flow - [C053643]				
60°F (15°C) Raw H ₂ O - gal/min (L/min)	16 (60.6)	18 (68.1)	20 (75.7)	23 (87.1)
100°F (37°C) Raw H ₂ O - gal/min (L/min)	22 (83.3)	24 (90.8)	26 (98.4)	31 (117)
Heat Exchanger (NSR Standard Removable Bundle) Maximum Cooling Raw Water - [C053643]				
Inlet Pressure - psi (bar)	60 (4.1)			
Flow - gal/min (L/min)	190 (719)			
Heat Exchanger (NSR Seawater Removable Bundle) Minimum Flow - [C053878]				
60°F (15°C) Raw H ₂ O - gal/min (L/min)	21 (79.5)	22 (83.3)	25 (94.6)	28 (106)
100°F (37°C) Raw H ₂ O - gal/min (L/min)	26 (98.4)	29 (110)	30 (114)	34 (129)
Heat Exchanger (NSR Seawater Removable Bundle) Maximum Cooling Raw Water - [C053878]				
Inlet Pressure - psi (bar)	60 (4.1)			
Flow - gal/min (L/min)	190 (719)			
Typical Engine H ₂ O Operating Temp - °F (°C)	185 (85) - 200 (93.3)			
Thermostat				
Start to Open - °F (°C)	189 (87.2)			
Fully Opened - °F (°C)	208 (97.8)			
Engine Coolant Capacity - qt (L)	40 (37.9)			
Coolant Pressure Cap - lb/in ² (kPa)	10 (68.9)			
Maximum Engine Coolant Temperature - °F (°C)	219 (104)			
Minimum Engine Coolant Temperature - °F (°C)	160 (71.1)			
High Coolant Temp Alarm Switch - °F (°C)	217 (103)			

Electric System - DC

	Standard	
System Voltage (Nominal)	24	
Battery Capacity for Ambients Above 32°F (0°C)		
Voltage (Nominal)12	12	{C07633}
Qty. Per Battery Bank	2	
SAE size per J537	8D	
CCA @ 0°F (-18°C) per J537	1200	
Reserve Capacity - Minutes per J537	430	
Battery Cable Circuit, Max Resistance - ohm	0.0012	
Battery Cable Minimum Size		
0-120 in. Circuit Length ²	00	
121-160 in. Circuit Length ²	000	
161-200 in. Circuit Length ²	0000	
Charging Alternator Maximum Output - Amp,	50	{1693345}
Starter Cranking Amps, Rolling - @60°F (15°C)	375	{C072743}

Exhaust System (Single Exhaust Outlet)

	1470	1760	1900	2100
Exhaust Flow - ft. ³ /min (m ³ /min)	2945 (83.4)	3170 (89.8)	3470 (98.3)	3830 (108)
Exhaust Temperature - °F (°C) (corrected to 77°F)	996 (536)	880 (471)	908 (487)	953 (512)
Maximum Allowable Back Pressure - in H ₂ O (kPa)	40 (10)	40 (10)	40 (10)	40 (10)
Minimum Exhaust Pipe Dia. - in (mm) ³	8 (203)	8 (203)	8 (203)	8 (203)

Fuel System

	1470	1760	1900	2100
Fuel Consumption - gal/hr (L/hr)	27.4 (104)	26.5 (100)	29.6 (112)	31.5 (119)
Fuel Return - gal/hr (L/hr)	72.5 (274)	72.5 (274)	71.3 (270)	68.5 (259)
Fuel Supply - gal/hr (L/hr)	99.9 (378)	99.0 (375)	100.9 (382)	100.0 (378)
Fuel Pressure - lb/in ² (kPa)	90 (621) - 110 (758)			
Minimum Line Size - Supply - in.	.75 Schedule 40 Steel Pipe			
Pipe Outer Diameter - in (mm)	1.05 (26.7)			
Minimum Line Size - Return - in.	.50 Schedule 40 Steel Pipe			
Pipe Outer Diameter - in (mm)	0.848 (21.5)			
Max. Allowable Fuel Pump Suction Lift w/ clean Filter				
at Customer Connection Block - in H ₂ O (mH ₂ O)	71 (1.8)			
Maximum Allowable Fuel Head above Fuel pump, Supply or Return - ft (m)	15 (4.6)			
Fuel Filter Micron Size	2 (Secondary)			
Maximum fuel supply temperature - °F (°C)				

Heater System

	Standard	Optional
Engine Coolant Heater		
Wattage (Nominal)	3500	
Voltage - AC, 1 Phase	230	
Part Number	{C127975}	

Air System

System	1470	1760	1900	2100
Combustion Air Flow - ft. ³ /min (m ³ /min)	1135 (32.1)	1189 (33.7)	1350 (38.2)	1505 (42.6)
Air Cleaner	Standard		Optional	
Part Number	{C03595}		{C03330}	
Type	Indoor Service Only, with Shield		Canister, Single-Stage	
Cleaning method	Washable		Disposable	
Air Intake Restriction Maximum Limit				
Dirty Air Cleaner - in H ₂ O (kPa)	25 (6.2)		25 (6.2)	
Clean Air Cleaner - in H ₂ O (kPa)	15 (3.7)		15 (3.7)	
Maximum Allowable Temperature (Air To Engine Inlet) - °F (°C)	120 (48.9)			

Lubrication System

Oil Pressure - normal - lb/in ² (kPa)	40 (276) - 70 (483)
Low Oil Pressure Alarm Switch - lb/in ² (kPa)	22 (152)
In Pan Oil Temperature - °F (°C)	200 (93.3) - 230 (110)
Total Oil Capacity with Filter - qt (L)	48 (45.4)

Lube Oil Heater

Wattage (Nominal)	<u>Optional</u> 300	<u>Optional</u> 300
Voltage	120V (+5%, -10%)	240V (+5%, -10%)
Part Number	{C04559}	{C04560}

Performance

	<u>1470</u>	<u>1760</u>	<u>1900</u>	<u>2100</u>
BMEP - lb/in ² (kPa)	219 (1510)	187 (1290)	184 (1270)	166 (1140)
Piston Speed - ft/min (m/min)	1764 (538)	2112 (644)	2280 (695)	2520 (768)
Mechanical Noise - dB(A) @ 1m	C138028 - Reference Noise data on Engine Page at www.clarkefire.com			
Power Curve	C137955 - Reference Power Curve on Engine Page at www.clarkefire.com			

NOTE: This engine is intended for indoor installation or in a weatherproof enclosure. ¹ Derate 3% per every 1000 ft. 304.8m above 300 ft. 91.4m and derate 1% for every 10°F 5.55 °C above 77°F 25°C. ² Positive and Negative Cables Combined Length. ³ Minimum Exhaust Pipe Diameter is based on: 15 feet of pipe, one 90° elbow, and one Industrial silencer. A Back-pressure flow analysis must be performed on the actual field installed exhaust system to assure engine maximum allowable back pressure is not exceeded. See Exhaust Sizing Calculator on www.clarkefire.com. { } indicates component reference part number.



C18H0 ENGINE MODELS ENGINE MATERIALS AND CONSTRUCTION

Air Cleaner

Type..... Indoor Usage Only
Oiled Fabric Pleats
Material..... Surgical Cotton, Aluminum Mesh

Air Cleaner - Optional

Type..... Canister
Material..... Pleated Paper
Housing..... Enclosed

Camshaft

Material..... Forged Steel, Hardened
Location..... In Head
Drive..... Gear, Spur
Type of Cam..... Ground

Charge Air Cooler

Type..... Raw Water Cooled

Materials (in contact with raw water)

Tubes..... 90/10 CU/NI
Headers..... 36500 Muntz
Covers..... 83600 Red Brass
Plumbing..... 316 Stainless Steel/ Brass
90/10 Silicone

Coolant Pump

Type..... Centrifugal
Drive..... Gear

Coolant Thermostat

Type..... Full Blocking
Qty..... 2

Cooling Loop (Galvanized)

Tees, Elbows, Pipe..... Galvanized Steel
Ball Valves..... Brass ASTM B 124
Solenoid Valve..... Brass
Pressure Regulator..... Bronze
Strainer..... Cast Iron (1/2" - 1" Loops)
or Bronze (1.25" - 2" Loops)

Cooling Loop (Sea Water)

Tees, Elbows, Pipe..... 316 Stainless Steel
Ball Valves..... 316 Stainless Steel
Solenoid Valve..... 316 Stainless Steel
Pressure Regulator/Strainer..... Cast Brass ASTM B176 C87800

Cooling Loop (316SS)

Tees, Elbows, Pipe..... 316 Stainless Steel
Ball Valves..... 316 Stainless Steel
Solenoid Valve..... 316 Stainless Steel
Pressure Regulator/Strainer..... 316 Stainless Steel

Cooling Loop (90/10 CuNi)

Tees, Elbows, Pipe..... 90/10 CuNi
Ball Valves..... 922 Bronze Body/316SS Ball
Solenoid Valve..... 316 Stainless Steel
Pressure Regulator/Strainer..... Cast Brass C87800

Connecting Rod

Type..... I-Beam Taper
Material..... Forged Steel Alloy

Crank Pin Bearings

Type..... Precision Half Shell
Number..... 1 Pair Per Cylinder

Crankshaft

Material..... Forged Steel
Type of Balance..... Dynamic

Cylinder Block

Type..... One Piece
Material..... Grey Iron

Cylinder Head

Type..... Slab 4 Valve
Material..... Cast Iron

Cylinder Liners

Type..... Centrifugal Cast, Wet Liner
Material..... Compacted Graphite and Iron

Valves

Type..... Poppet
Material..... Steel Alloy
Arrangement..... Overhead Valve
Number/Cylinder..... 2 intake/2 exhaust
Operating Mechanism..... Mechanical Rocker Arm
Type of Lifter..... Solid Roller
Valve Seat Insert..... Replaceable

Exhaust Manifold

Material..... Iron Alloy

Fuel Pump

Type..... Gear
Drive..... Gear

Heat Exchanger (Brazed)

Type..... Shell & Tube

Materials

Tube & Headers..... Copper
Shell..... Copper
Electrode..... Zinc

Heat Exchanger (Serviceable)

Type..... Shell & Tube

Materials

Tube..... Copper C122
Header Assy..... Copper C122/Nylon/EPDM Rubber
Shell..... Aluminum 356-T6
Endcaps..... Cast Iron CL 30/Aluminum 356-T6
Electrode..... Zinc

Sea Water Heat Exchanger (Serviceable, 90/10 CuNi)

Type..... Shell & Tube

Materials

Tube..... CuNi 70600
Header Assy..... CuNi 70600/Nylon/Rubber
Shell..... Aluminum 356-T6
Endcaps..... C836 Bronze
Electrode..... Zinc

Injection Pump

Type..... Electronic Unit Injector
Drive..... Cam Shaft

Lubrication Cooler

Type..... Shell & Tube

Lubrication Pump

Type..... Gear Pump
Drive..... Gear

Main Bearings

Type..... Precision Half Shells

Piston

Type and Material..... Aluminum Alloy
Cooling..... Oil Jet Spray

Piston Pin

Type..... Full Floating

Piston Rings

Number/Piston..... 3

Clarke Model	C18H0-UFAD12			
Derived Rating	364	kW	488	hp
Rated Speed	2100	rpm	2100	rpm
NOx	2.94	g/kW-hr	2.19	g/hp-hr
HC	0.17	g/kW-hr	0.12	g/hp-hr
PM	0.199	g/kW-hr	0.149	g/hp-hr
CO	1.90	g/kW-hr	1.41	g/hp-hr
Certified Rating	470 kW		630 hp	
Rated Speed	2100 rpm		2100 rpm	
NOx	3.86 g/kW-hr		2.88 g/hp-hr	
HC	0.05 g/kW-hr		0.04 g/hp-hr	
PM	0.09 g/kW-hr		0.07 g/hp-hr	
CO	0.60 g/kW-hr		0.45 g/hp-hr	

-Applicable to Cat C18 700hp Tier 3, 630hp Tier 3 fire pump driver engines.

-PQ3060, PQ3061 respectively

-700 hp and 630 hp ratings are U.S. EPA certified as variable speed Emergency Stationary engines per 40 CFR Part 60 Subpart IIII.

-Estimated Nominal Emissions data for the fire pump rating cycle emissions are shown above.

-These engines are Certified to the variable speed 8 Mode C1 cycle that can be used in either constant or variable speed applications.

-This information is Caterpillar Confidential. Unauthorized distribution of this information beyond its intended audience is prohibited.

DATUMS:

- A- MOUNTING FACE OF FLYWHEEL
- B- ENGINE CRANKSHAFT HORIZONTAL
- C- ENGINE CRANKSHAFT VERTICAL
- CENTER OF GRAVITY
- CLOCKWISE (CW) ROTATION WHEN VIEWED FROM FRONT OF ENGINE

CAUTION:

ALL PLUMBING MUST BE SUPPORTED AND/OR ISOLATED SO THAT NO WEIGHT OR STRESS IS APPLIED TO ANY ENGINE COMPONENT

ATTENTION:

REFER TO THE SPECIFIC MODELS' "INSTALLATION AND OPERATION DATA" FOR INSTALLATION GUIDELINES

AVAILABLE MODELS:

C18H0-UFAD12
C18H0-UFAD22
C18H0-UFAD32

C18H0-UFAD12-D
C18H0-UFAD22-D
C18H0-UFAD32-D

MODELS ARE TURBOCHARGED WITH RAW WATER AFTER COOLING

NOTES:

- FUEL SUPPLY PIPING FROM TANK TO ENGINE SHOULD BE 3/4" MINIMUM PIPE DIAMETER
- FUEL RETURN PIPING FROM TANK TO ENGINE SHOULD BE 1/2" MINIMUM PIPE DIAMETER
- THE LOOP SHOWN IS BASED ON STANDARD LOOP CONSTRUCTION AND FM SIZING CONDITIONS
- HEAT EXCHANGER HAS REMOVABLE ENDCAPS TO SERVICE THE INTERNAL BUNDLE. THE BUNDLE CAN BE REMOVED FROM EITHER END

FOR ALTERNATE LOOP CONSTRUCTION (STAINLESS STEEL, SEA WATER AND HIGH PRESSURE) SIZES MAY VARY

CONTROLLED DRAWING

THIS IS A REGISTERED PART WITH A THIRD PARTY AGENCY FOR USE ON A PRODUCT. NO SUBSTITUTIONS ARE ALLOWED. CONSULT ENGINEERING PRIOR TO AND REGARDING ANY CHANGE.

FOR ENGINE SPECIFIC OPTIONS
SEE www.clarkefire.com

DRAWING SUBJECT
TO CHANGE
WITHOUT NOTICE
DO NOT SCALE

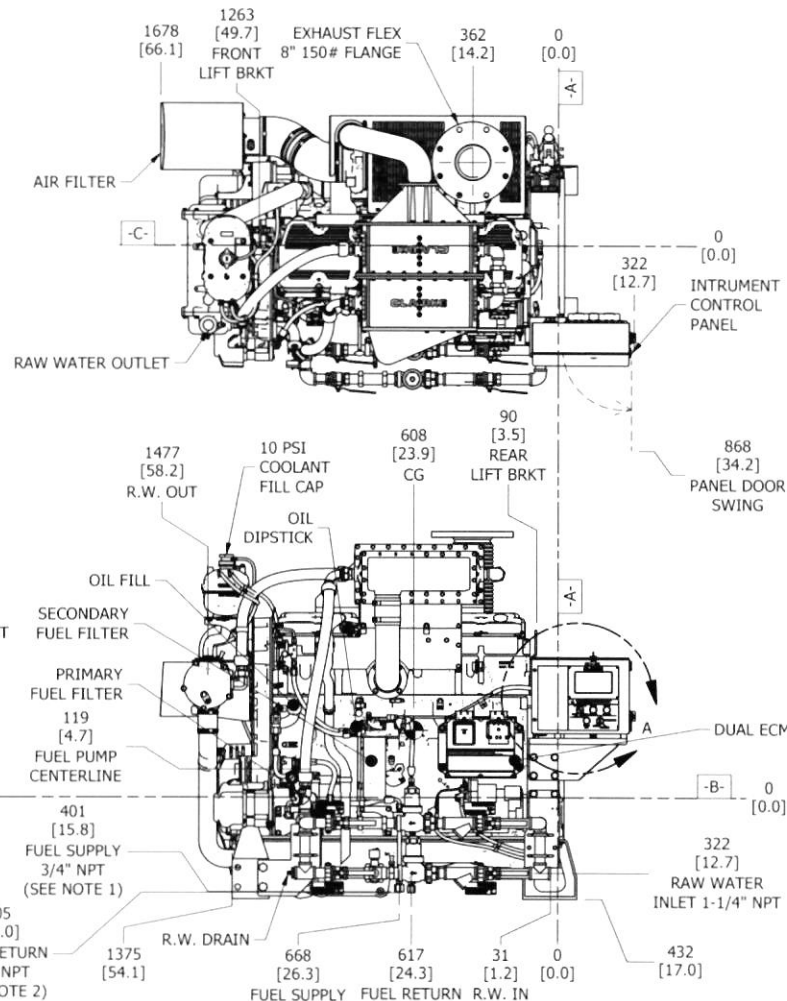
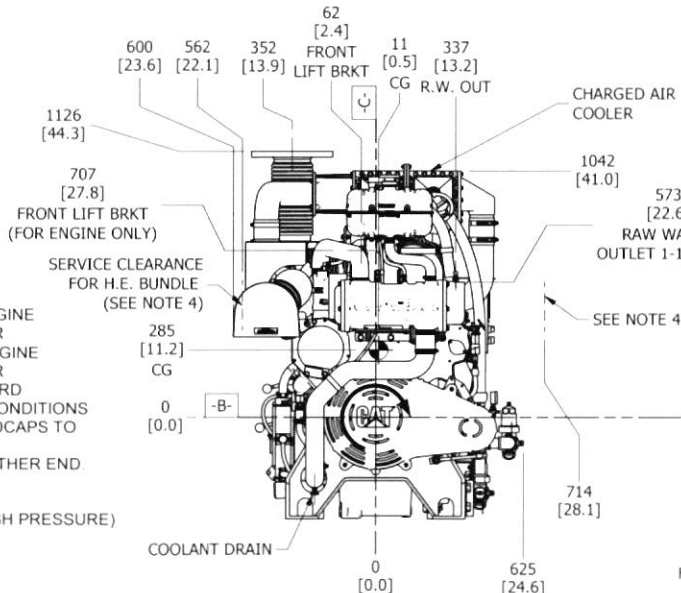
REV	DESCRIPTION	ECN#	DWN	APVD	DATE
A	ISSUED ENGINEERING DRAWING	6917	RAZ	MJD	16JAN25

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DRAWN: LJVANDERMEULEN DATE: 1/16/2025 CHECKED: MJDEMBKOWSKI MATERIAL: ASSEMBLY: TSP-E DIMENSIONS: D883	PART NO: D963 SCALE: NTS UNITS: MM [INCH]	PAGE: 1 OF 2	REV: A

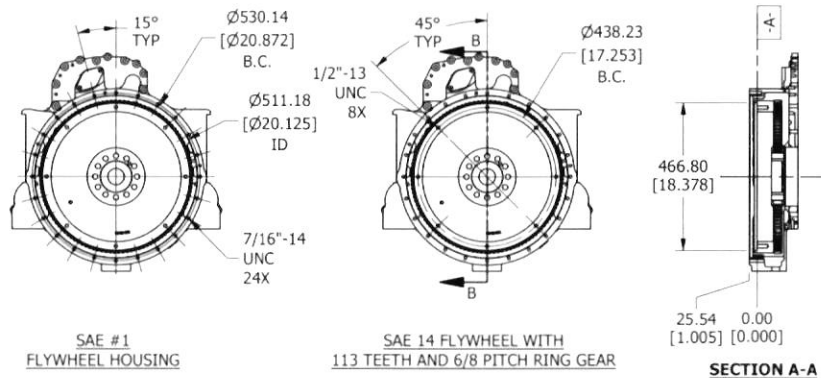
Ø1.375"
CONDUIT HOLE

PANEL CONDUIT ACCESS
1.375" HOLE UNDER PLUG

DETAIL A



DETAIL DATUM -A-

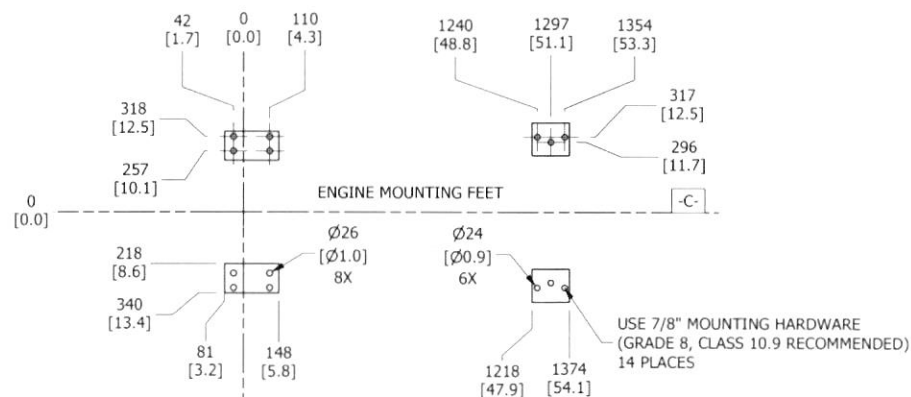


SAE #1
FLYWHEEL HOUSING

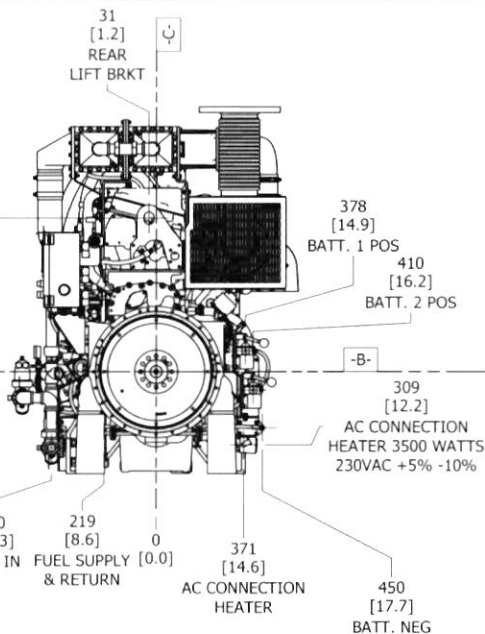
SAE 14 FLYWHEEL WITH
113 TEETH AND 6/8 PITCH RING GEAR

SECTION A-A

ENGINE MOUNTING FEET



652 [25.7]
REAR LIFT BRKT
(FOR ENGINE ONLY)



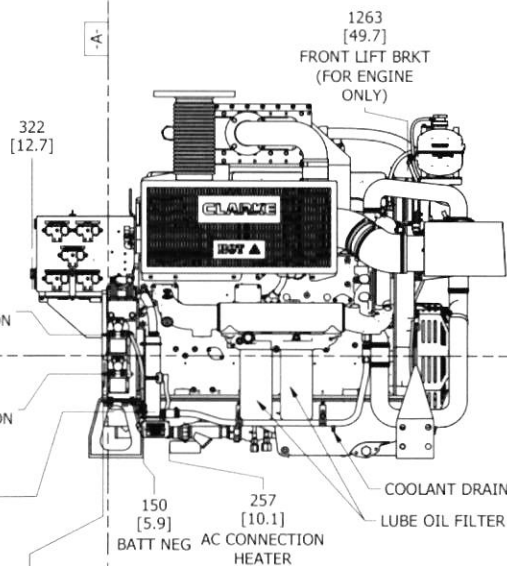
88 [3.4]
24V BATT. 1 POS CONNECTION
3/8\"-16 STUD

78 [3.1]
24V BATT. 2 POS CONNECTION
3/8\"-16 STUD

237 [9.3]
BATT. NEG CONNECTION
M10 X 1.5

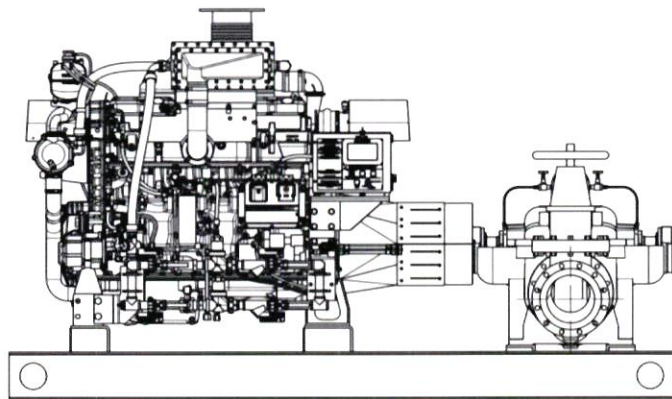
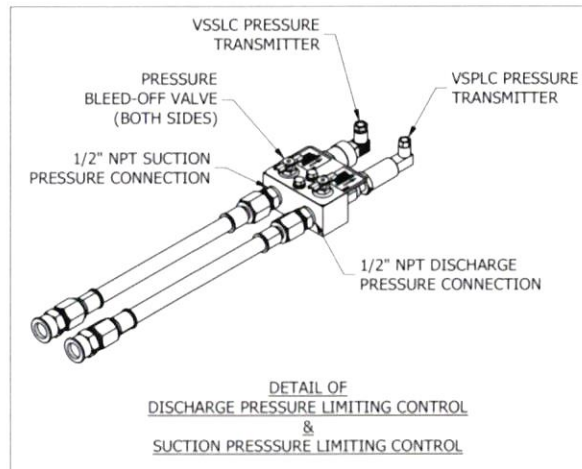
20 [0.8]
BATT POS

1263 [49.7]
FRONT LIFT BRKT
(FOR ENGINE ONLY)



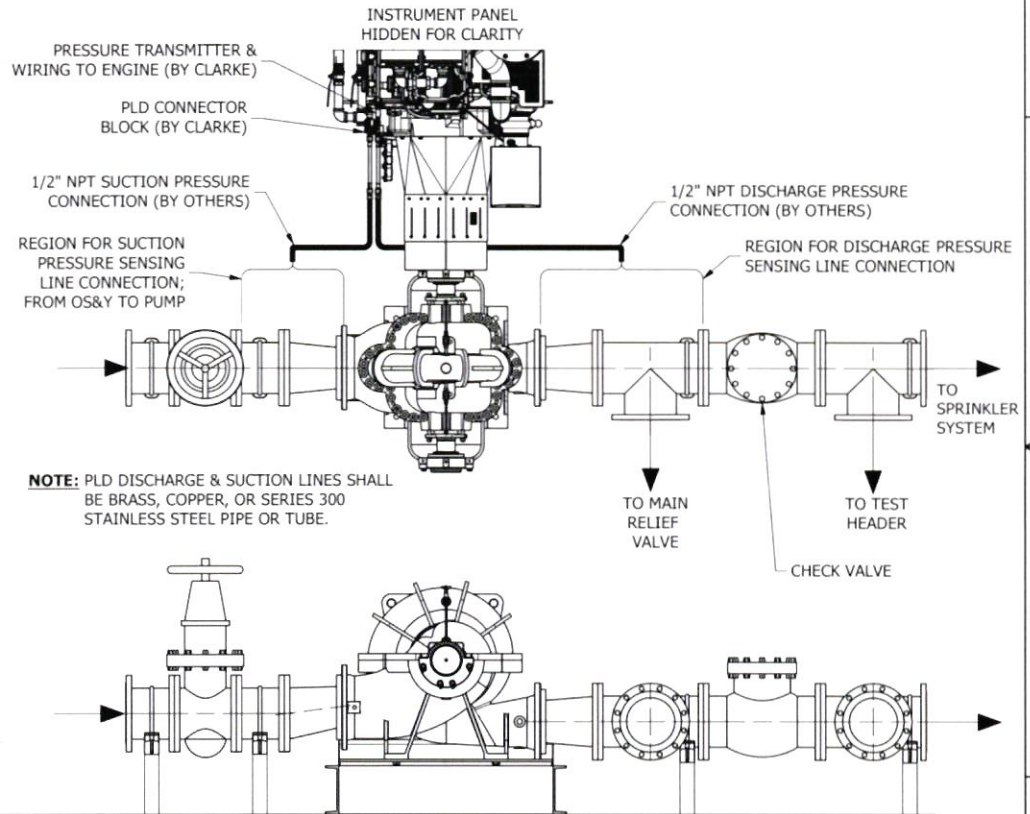
COOLANT DRAIN
LUBE OIL FILTER

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UNLESS NOTED OTHERWISE TOLERANCES SHOWN ARE IN INCHES DECIMALS THEREOF.		NAME: LJVANDERMEULEN	
DATE: 1/16/2025		INSTALLATION DRAWING, FIRE PUMP ENGINE C18H0 & C18H0 PLD T3 NSR w/ TSP-E MODELS	
DRAWN BY: MJDEMBKOWSKI		PART NO: D963	
ASSEMBLY: TSP-E		SCALE: NTS	
DRAWN TO: DBB3		UNITS: MM [INCH]	
PAGE: 2		OF: 2	



SUCTION PRESSURE LIMITING CONTROL SENSING LINE CONNECTION

THE SINGLE SUCTION PRESSURE LIMITING CONTROL SENSING LINE SHALL BE CONNECTED IN THE IMMEDIATE REGION UPSTREAM OF THE PUMP INLET.



DISCHARGE PRESSURE LIMITING CONTROL SENSING LINE CONNECTION

THE SINGLE DISCHARGE PRESSURE CONTROL SENSING LINE SHALL BE CONNECTED IN THE REGION BETWEEN THE PUMP DISCHARGE FLANGE & THE CHECK VALVE.

NOTE: PLD DISCHARGE & SUCTION LINES SHALL BE BRASS, COPPER, OR SERIES 300 STAINLESS STEEL PIPE OR TUBE.

- NOTES:
1. SEE DRAWING FOR ACTUAL CONTENT
 2. SIZE IS 8.5" X 11"
 3. DOCUMENT IS LAMINATED
 4. INK: COLOR
 5. PAGES TO BE DOUBLE SIDED

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UNLESS NOTED OTHERWISE TOLERANCES UNLESS NOTED OTHERWISE ARE AS SHOWN BELOW	DATE	1/17/2025
STANDARD TOLERANCE	ENGINEER	MJDEMBKOWSKI
DECIMAL .001	MATERIAL	TSP-E
A .001	ASSEMBLY	TSP-E
X .001	FINISH TO	C137984
X .001		

CLARKE

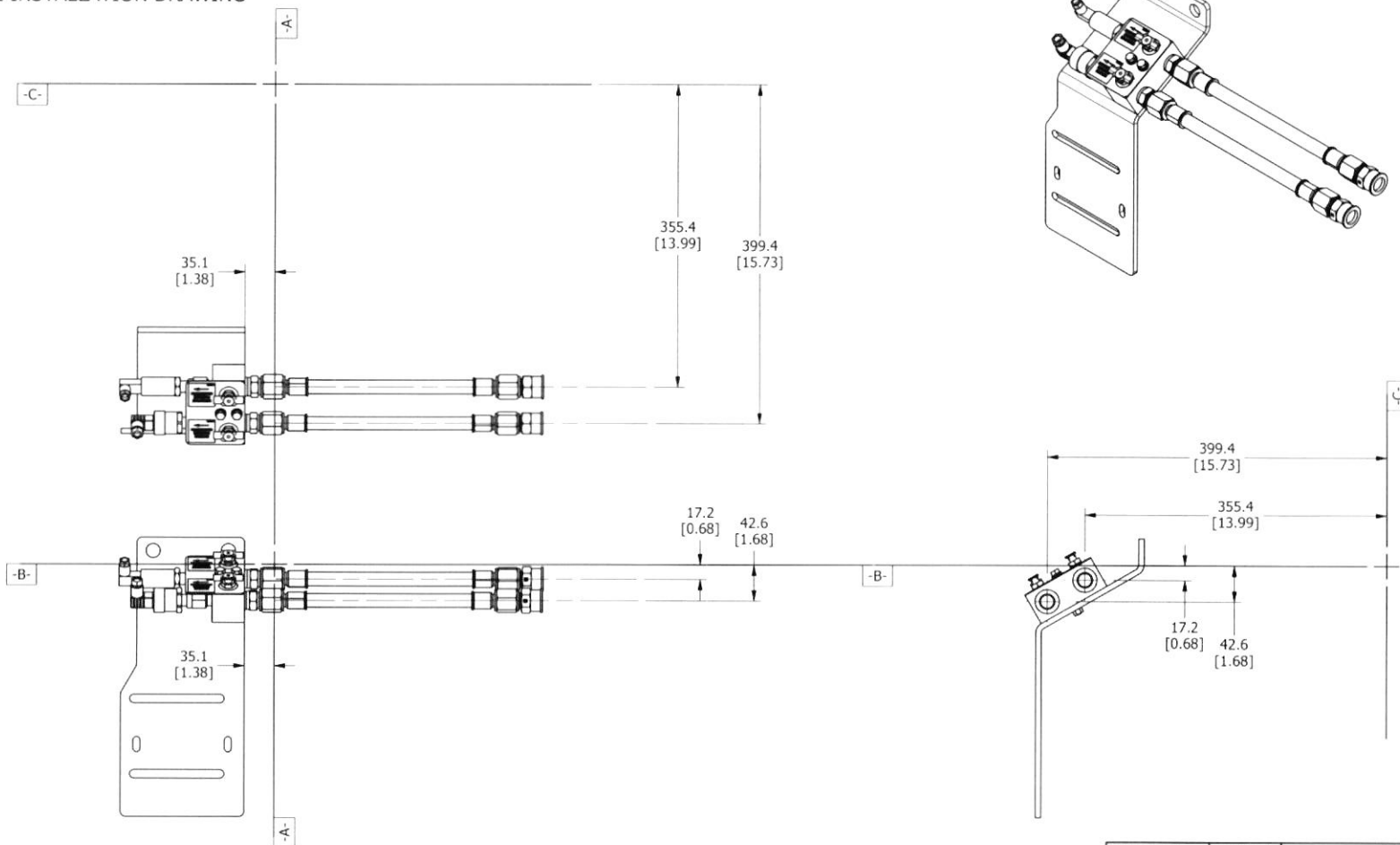
SCHEMATIC, C18 ELECTRONIC PLD, NSR w/ TSP-E

C139520

SCALE NTS UNITS MM [INCH] 1 2

REV	DESCRIPTION	ECN#	DWN	APVD	DATE
A	ISSUED ENGINEERING DRAWING	6917	LJV	<i>MJD</i>	17JAN25

CLARKE C18 ENGINE MODELS
REFERENCE D959 FOR STANDARD
ENGINE INSTALLATION DRAWING



DATUMS:

- A- - MOUNTING FACE OF FLYWHEEL
- B- - ENGINE CRANKSHAFT HORIZONTAL ϵ
- C- - ENGINE CRANKSHAFT VERTICAL ϵ

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UNLESS NOTED OTHERWISE TOLERANCES GIVEN ARE IN MILLIMETERS (INCHES) IN PARENTHESES.		NAME: LJ VANDERMEULEN	
DATE: 1/17/2025		SCHEMATIC, C18 ELECTRONIC PLD, NSR w/ TSP-E	
DESIGN: MJDEMBKOWSKI		PART NO: C139520	
MATERIAL: TSP-E		SCALE: NTS	
ASSEMBLY: C137964		UNITS: MM [INCH]	
ANGLE: 1:1		PAGE 2 OF 2	



C18H0-UFAD12

FIRE PUMP DRIVER

NOISE DATA

Mechanical Engine Noise *

RPM	BHP	OVERALL dB(A)	Octave Band									
			31.5 Hz dB(A)	63 Hz dB(A)	125 Hz dB(A)	250 Hz dB(A)	500 Hz dB(A)	1k Hz dB(A)	2k Hz dB(A)	4k Hz dB(A)	8k Hz dB(A)	16k Hz dB(A)
1470	450	102.10	46.00	62.90	81.90	82.20	93.80	99.50	94.80	92.10	79.50	68.20
1760	460	102.70	57.60	61.30	66.70	83.00	89.20	99.80	98.20	91.30	80.50	67.20
1900	488	108.20	60.10	65.20	70.10	84.50	94.20	106.50	101.50	95.60	84.30	70.70
2100	488	109.60	61.80	66.10	72.90	89.60	96.50	107.70	103.30	96.40	86.50	73.00

Raw Exhaust Engine Noise **

RPM	BHP	OVERALL dB(A)	Octave Band									
			31.5 Hz dB(A)	63 Hz dB(A)	125 Hz dB(A)	250 Hz dB(A)	500 Hz dB(A)	1k Hz dB(A)	2k Hz dB(A)	4k Hz dB(A)	8k Hz dB(A)	16k Hz dB(A)
1470	450	112.30	81.30	108.60	105.10	101.30	103.70	100.60	100.90	93.50	85.10	76.30
1760	460	113.50	64.80	80.50	93.70	101.00	105.80	108.50	108.80	103.10	92.30	85.00
1900	488	113.80	64.80	80.20	93.00	101.20	106.00	109.20	109.00	103.30	93.50	88.00
2100	488	114.20	64.50	80.10	92.20	100.00	105.50	110.30	109.50	103.50	92.50	87.20

* Values above are provided at 3.3ft (1m) from engine block and do not include the raw exhaust noise.

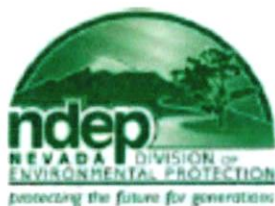
** Values above are provided at 23ft (7m), 90° horizontal, from a vertical exhaust outlet and does not include noise created mechanically by the engine.

The above data reflects values for a typical engine of this model, speed and power in a free-field environment.

Installation specifics such as background noise level and amplification of noise levels from reflecting off of surrounding objects, will affect the overall noise levels observed. As a result of this, Clarke makes no guarantees to the above levels in an actual installation.

ATTACHMENT C

AIR DISPERSION MODELING REPORT



NEVADA DIVISION OF ENVIRONMENTAL PROTECTION BUREAU OF AIR POLLUTION CONTROL

ENVIRONMENTAL EVALUATION (MODELING) CHECKLIST

Facility Name & Permit No. South Valley Technology Park

Type of Permit Application New Class I OPTC

Facility Location 8990 USA Parkway
McCallan, NV 89437 **Date Completed** 02/23/28 **Modeler Name/Firm** BlueScape Environmental

Modeling Protocol Submission (Optional but Recommended)		✓
1	Applicant submitted proposed modeling protocol to NDEP-BAPC for agency review/comment prior to any modeling?	N
Environmental Evaluation Data to be Prepared by the Applicant		✓
2	Detailed facility plot plan drawn to appropriate scale, which clearly shows all fencelines/property-lines, topography, emission units, stacks, storage tanks, facility buildings & roof heights, public roads, neighboring properties, etc.	Y
3	Emissions inventory spreadsheet of all regulated pollutants (PM, PM ₁₀ , SO ₂ , NO _x , CO, VOCs, Pb, HAPs, and H ₂ S) emitted from all emission units and insignificant activities and submitted in hardcopy and electronic formats?	Y
4	Spreadsheet uses appropriate EPA AP-42 emission factors, manufacturer's data, and/or facility stack test results?	Y
5	Applicant researched/considered appropriate ambient background values for all pollutants modeled?	Y
6	Facility's modeling receptor grids are appropriately spaced and reflect surrounding terrain (e.g., flat or complex)?	Y
7	Complex terrain (terrain > stack height) modeling runs incorporate appropriate terrain height data (e.g., USGS)?	Y
8	Effects of nearby facilities (co-located facilities, facilities sharing a common fenceline/property-line) considered?	N/A
Dispersion Modeling Runs		✓
9	Uses an EPA-approved/recommended dispersion model appropriate for the task (e.g., ISCST3)?	Y
10	NDEP-BAPC agrees with use of the selected meteorological data set?	Y
11	Modeled all criteria pollutants at the requested permit emission limits (including all insignificant activity emissions)?	Y
12	Highest impact for each pollutant/averaging time + background shows attainment with all NV ambient standards?	Y
13	Modeled secondary pollutants such as ozone - O ₃ (e.g., Scheffe screening analysis or ISCST3)?	Y
14	Model incorporates appropriate operating schedule (e.g., 24 hrs/day or a lesser operating schedule such as 8-5)?	Y
15	Model runs apply appropriate building downwash effects for all affected stack sources (e.g., BPIP)?	Y
16	Model runs distinguish correctly between stack (point), process fugitive (volume), and area source emissions? sources?	Y
Final Modeling Report (included as part of application submittal)		✓
17	Modeling report includes appropriate summary narrative (e.g., writeup), data tables, plot plan, maps, figures, etc?	Y
18	Data provided is illustrative and clearly demonstrates compliance with all appropriate ambient standards?	Y
19	Modeling report includes appropriate hardcopy printouts of all plots (graphs) and model run outputs?	Y
20	Modeling report includes electronic (diskette or CD-ROM) input/output files and meteorology data set?	Y

AIR DISPERSION MODELING REPORT

SOUTH VALLEY TECHNOLOGY CENTER MCCARRAN, NEVADA

Submitted to:

**Nevada Division of Environmental Protection
Bureau of Air Pollution Control**
901 South Stewart Street, Suite 4001
Carson City, NV 89701

Prepared for:

SV RNO Property Owner 1, LLC
3200 Cherry Creek S Drive, Suite 700
Denver, CO 80209

Prepared by:

BlueScape Environmental
16870 West Bernardo Drive, Suite 400
San Diego, CA 92127



February 25, 2026

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ATTACHMENTS

- Attachment A: Modeling Inputs
- Attachment B: Modeling Scenarios and Emission Rates
- Attachment C: Scheffe Ozone Calculations

1.0 INTRODUCTION

SV RNO Property Owner 1, LLC (SV RNO) is seeking authorization in the form of a new Class I operating permit to construct (OPTC) for the South Valley Technology Center (SVTC or Facility) to be located in McCarran, Nevada. The Facility will have the following proposed equipment: a P1 Power Plant consisting of natural gas-fueled engines with combined rating of 144 megawatts (MW), liquified natural gas (LNG) vaporizers, and diesel-fueled emergency black start engine (BSE) gensets with combined rating of 5.5 MW; diesel-fueled emergency backup data center (DC) engines with a combined rating of 318 MW serving as backup power for a data center; Substation diesel-fueled emergency backup engines; fire pump engines; and associated diesel storage tanks.

All of the diesel-fueled emergency engines, except for the fire pump engines, will be available under NV Energy's demand response (DR) program, which allows for 50 hours per year per engine of emergency use when called upon by NV Energy, in addition to the 50 hours allowed for non-emergency testing and maintenance. The Facility will be located in the northeastern section of an approximately 1,519-acre parcel located in Storey County southwest of Highway 439 on Assessor's Parcel Number (APN) 0047-171-25. The Project site is in an area that is in attainment for all criteria pollutants. The Facility is located within the jurisdiction of the Nevada Division of Environmental Protection (NDEP) Bureau of Air Pollution Control (BAPC). This document presents the results of the air dispersion modeling analysis conducted for the Facility.

Nevada Administrative Code (NAC) Section 445B.310 requires facilities applying for air operating permits that would have the potential to emit (PTE) of greater than 25 tons per year (TPY) of at least one criteria pollutant to perform an environmental evaluation, which includes air dispersion modeling of the proposed Facility. Because the proposed South Valley Technology Center would have a PTE of greater than 25 TPY of at least one criteria pollutant, this analysis has been performed. The air dispersion modeling analysis ensures that the Facility will not cause or contribute to an exceedance of the National Ambient Air Quality Standards (NAAQS) and the Nevada Air Quality Standards (NvAAQS). Because NDEP uses NvAAQS to ensure that impacts from projects that are not classified as Prevention of Significant Deterioration (PSD) do not cause or contribute to an exceedance, the NvAAQS are used in this analysis to demonstrate that the Facility does not have significant impacts.

NDEP also requires that Class I Minor Sources, as well as PSD Major Sources, demonstrate that the thresholds for available PSD nitrogen dioxide (NO₂) and particulate matter of less than 10 microns in diameter (PM₁₀) increments in the region will not be exceeded with the addition of Project emissions (known as Increment Tracking). This analysis addresses the NO₂ and PM₁₀ Increment Tracking requirements.

This air dispersion modeling analysis is conducted in accordance with the NDEP modeling requirements and the NDEP/BAPC *Class I Air Quality Operating Permit*

Guidance Document, dated July 2021, the NDEP's *General Air Dispersion Modeling Guidelines*, dated September 2008 and the United States Environmental Protection Agency's (USEPA) *Guideline on Air Quality Models* (40 CFR 51, Appendix W). The criteria pollutants evaluated in this analysis are particulate matter with an aerodynamic diameter of less than 2.5 microns ($PM_{2.5}$), PM_{10} , oxides of nitrogen (NO_x and NO_2), volatile organic compounds (VOC), sulfur dioxide (SO_2) and carbon monoxide (CO). To analyze impacts from VOC emissions, NDEP requires ozone (O_3) modeling using a method developed by the USEPA entitled *VOC/ NO_x Point Source Screening Tables*, by Richard D. Scheffe. A PSD increment consumption analysis was also completed for NO_2 and PM_{10} emissions from the Project. This modeling analysis demonstrates compliance with the NvAAQS for all criteria pollutants and demonstrates that the Project will not lead to increment consumption exceeding the PSD increment thresholds.

2.0 FACILITY DESCRIPTION

The proposed Facility will construct the P1 Power Plant, four (4) generator buildings with 106 data center (DC) backup engines, one (1) data center building and accessory structures. The P1 Power Plant will have ninety (90) 2,146 brake-horsepower (bhp) (about 1.6 MW) Jenbacher J420 natural gas-fueled engines, with four (4) 1,370 kW (1,864 bhp) Tier 4 Volvo Penta diesel-fueled black start engine (BSE) gensets, each with dual engines, situated in the center of the P1 Plant, to be used for startup of the P1 Plant in an emergency situation, or when called upon for a grid emergency. Two (2) dual-burner LNG vaporizers rated at 52 MMBtu/hr each will support the P1 Plant. The P1 Power Plant with Jenbacher gas engines and BSE diesel gensets will be located at the southeast corner of the site and will be owned and operated by Aggreko. The two (2) LNG vaporizer units will be located just northeast of the P1 Power Plant and will be owned and operated by Stabilis.

Two east generator buildings will each include twenty-nine (29) 3.0 MW emergency backup DC engines. Two west generator buildings will each include twenty-four (24) DC engines. The Facility will also include two (2) 1.25 MW (1,676 bhp) Tier 2 Caterpillar C32 emergency diesel-fueled engines which will be used as "Substation" backup engines for auxiliary operations. Two (2) 364 kW (488 bhp) Tier 3 fire pump diesel-fueled engines will be installed at the Facility.

Fourteen (14) 40,000-gallon diesel storage tanks will be onsite, three (3) per west generator building and four (4) per east generator building, along with 150-gallon diesel day tanks attached to each of the 3.0 MW generators. The BSE gensets will have associated 1,240-gallon diesel tanks. The two Substation emergency backup engines will be located onsite at the Substation. The two fire pumps will be located onsite at the Security/Fire Building (SFB). The Substation engines will also have associated 150-gallon day tanks. The fire pumps will have associated 400-gallon diesel tanks. The diesel backup engines will be operated periodically for equipment maintenance and testing purposes. In addition, the BSE gensets, DC engines and Substation engines may be used for emergency demand-response when called upon by NV Energy. The diesel tank units will be insignificant activities (IAs).

Dispersion modeling for emissions impacts from the P1 Power Plant gas engines was based upon the maximum unit natural gas usage for up to 8,760 hours/year. Dispersion modeling for the emissions impacts from the LNG vaporizers was based upon the maximum burn rate of 52 MMBtu/hr per unit for up to 8,760 hours/year. All diesel-fired engines will be powered by diesel fuel and/or equivalent renewable diesel. Dispersion modeling for emissions impacts from the diesel-fired engines (except the two fire pump engines) was based upon the maximum diesel fuel each engine could use for non-emergency testing and maintenance purposes or for emergency demand-response, at maximum unit rating and 100% load for up to 100 hours/year. Dispersion modeling for impacts from the fire pump engines was based upon the maximum diesel fuel each engine could use for non-emergency testing and maintenance purposes at 100% load for up to 40 hours/year.

See Figures 1, 2 and 3 for the Facility site location, surrounding land uses and a representative site configuration for the P1 Power gas engines, the two LNG vaporizers, the four BSE gensets, the 106 DC backup emergency engines, the two Substation backup engines, and the two diesel fire pump engines.

3.0 SITE DESCRIPTION

The proposed Facility will be located in the northern section of an approximately 1,519-acre parcel located in Storey County about 21 miles east of Reno and about 30 miles northeast of Carson City. Highway 439 runs approximately 0.2 miles northeast of the site, and Interstate 80 runs approximately 9 miles north of the site. Facility emission sources will be centered at about UTM 293415 meters (m) E, 4371533 m N, WGS84 Zone 11. The proposed fenceline and Facility building locations at full buildout are shown in Figure 1. Figure 2 shows the locations of surrounding land uses. Figure 3 is a site map of the Facility showing locations of the P1 Power Plant (Jenbacher J420 engines, LNG vaporizers, and BSE gensets) the DC generator buildings with general engine locations, the data center building, the Substation engines, the fire pump engines, and the auxiliary buildings.

The area immediately surrounding the site is generally characterized by mountainous terrain averaging about 5,520 feet (ft) above sea level. Undeveloped terrain is to the west, east and south of the Project site. Industrial facilities are to the northwest of the Project site. The nearest residential location is about 5.4 miles to the south from the center of the Project site. The nearest school to the Facility is Silver Stage Elementary School located approximately 8.1 miles southwest of the Facility.

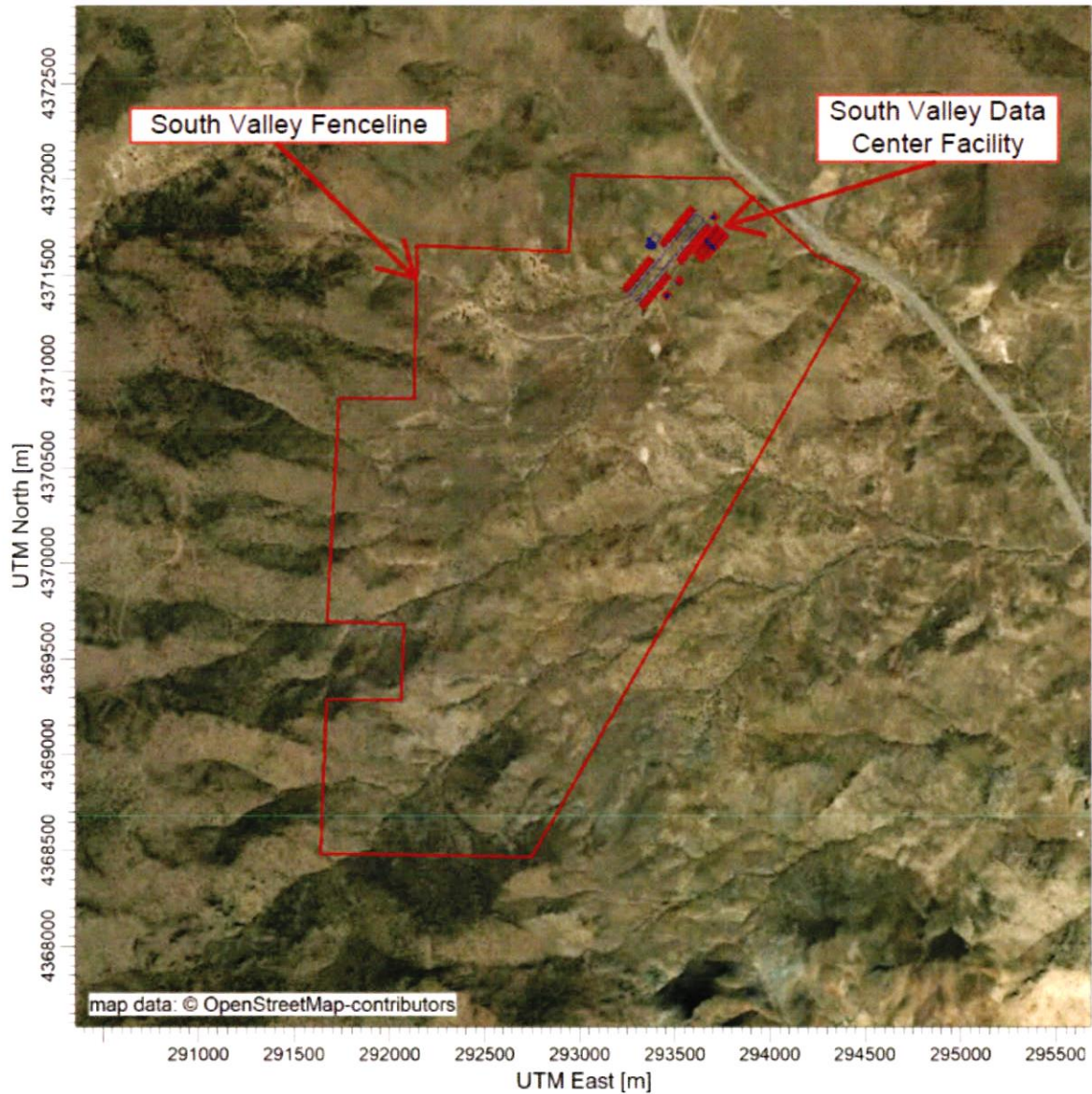
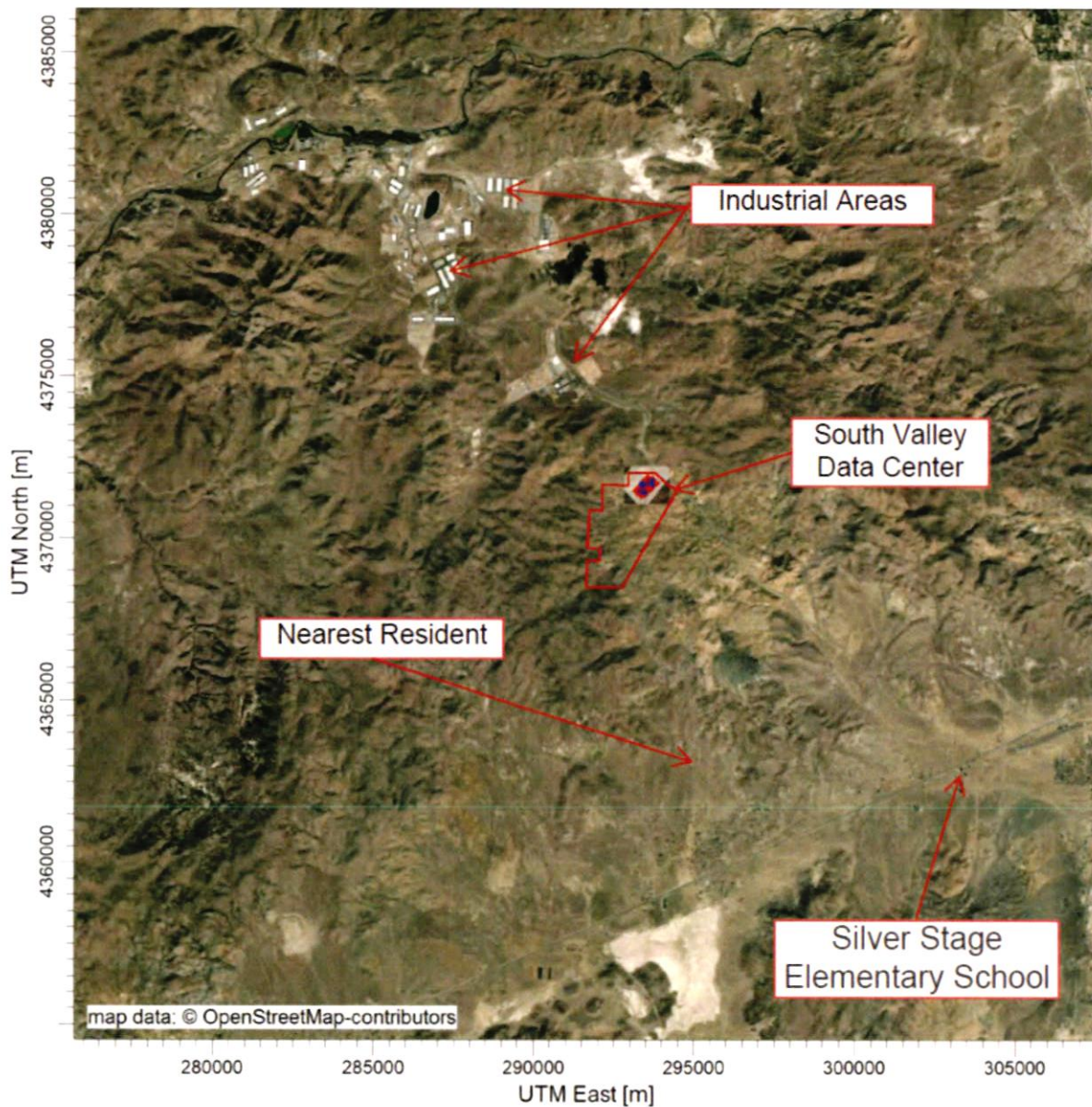


FIGURE 1. LOCATION OF THE SOUTH VALLEY TECHNOLOGY CENTER FACILITY



**FIGURE 2. SOUTH VALLEY TECHNOLOGY CENTER GENERAL LOCATION WITH
SURROUNDING LAND USES**

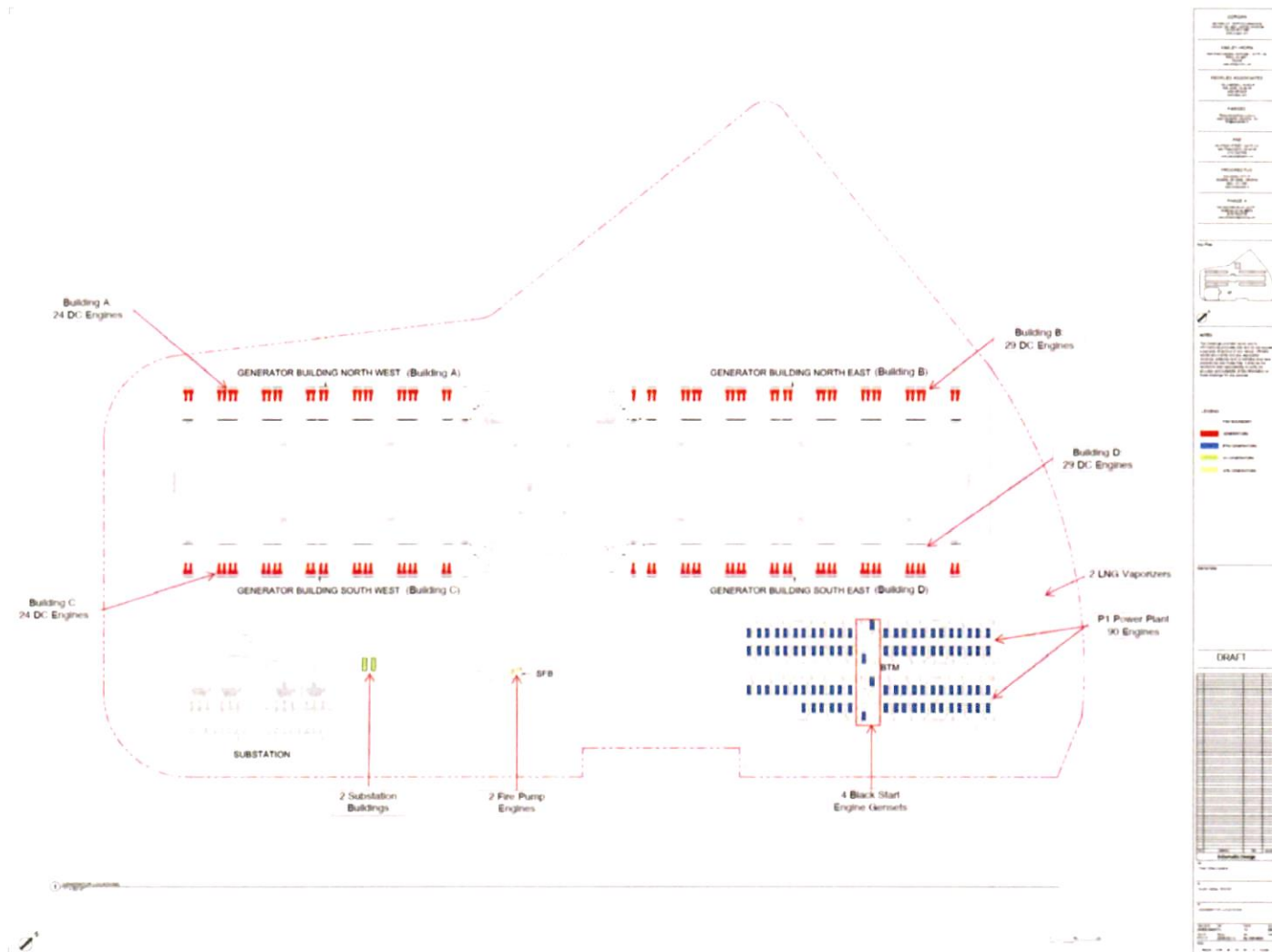


FIGURE 3. SOUTH VALLEY TECHNOLOGY CENTER SITE CONFIGURATION

4.0 MODEL SELECTION AND INPUT

4.1 Model Selection

In accordance with NDEP modeling guidance, the USEPA-approved AERMOD model version 24142 with Lakes Environmental software was used to conduct the modeling analysis. AERMOD is a sequential model that calculates concentrations at each receptor for every hour in the year. The model is designed for rural or urban applications and can be used with a rectangular or polar system of receptors.

4.2 Control Options and Land Use Classification

AERMOD was run in the regulatory default mode, including stack-tip downwash and use of elevated terrain algorithms. A review of the area surrounding the Facility indicated the urban option is not appropriate for this modeling demonstration because the surrounding land characteristics are distinctly rural. Consequently, the rural option was employed.

4.3 Source Data

Only point sources required evaluation using AERMOD. The P1 Power Plant gas engine stacks, two Substation emergency engine stacks and two fire pump engine stacks were modeled as point sources located as shown in Figure 3. The four BSE genset stacks each represent emissions from two engines per genset. The two LNG vaporizer stacks each represent emissions from two fuel burners. The 106 3.0 MW DC engine stacks were placed in each generator building according to detailed site maps, (see Figure 3).

At the P1 Prime Power plant, the P1 Power Plant gas engine stacks were modeled at a height of 25 feet (ft), stack diameter of 1.67 ft, temperature of 819°F and exhaust flow rate of 19,000.9 actual cubic feet per minute (acfm). The BSE genset stacks were modeled at a height of 9.6 ft, stack diameter of 0.93 ft (representing two stacks with 8-inch diameter each), temperature of 810°F and exhaust flow rate of 7,758 acfm. The LNG vaporizer stacks were modeled at a height of 22 ft, stack diameter of 2.828 ft (representing two stacks with 2 ft diameter each), temperature of 650°F and exhaust flow rate of 28,266 acfm.

The DC engine stacks in the generator buildings were modeled at a height of 60 ft, stack diameter of 1.0 ft, temperature of 902°F and exhaust flow rate of 22,806.2 acfm. The Substation emergency engine stacks were modeled at a height of 15 ft, a stack diameter of 1.0 ft, temperature of 806.6°F and a gas exit flow rate of 10,005 acfm. The fire pump engine stacks were modeled at a height of 20.5 ft, a stack diameter of 0.667 ft, temperature of 953°F and a gas exit flow rate of 3,830 acfm. Source locations were based upon a UTM WGS84, UTM Zone 11 projection. Attachment A provides the modeling input data for the sources and buildings.

AERMOD has the capability to account for building downwash produced by airflow over and around structures. Direction-specific building downwash parameters were developed for Project sources for input into AERMOD using the USEPA Building Profile Input Program, or BPIP Model. The BPIP model requires building dimensions as well as stack locations for input. Base elevations for sources and buildings were set at base elevations listed on site maps. The configuration of the Facility and AERMOD sources is shown in Figure 4.

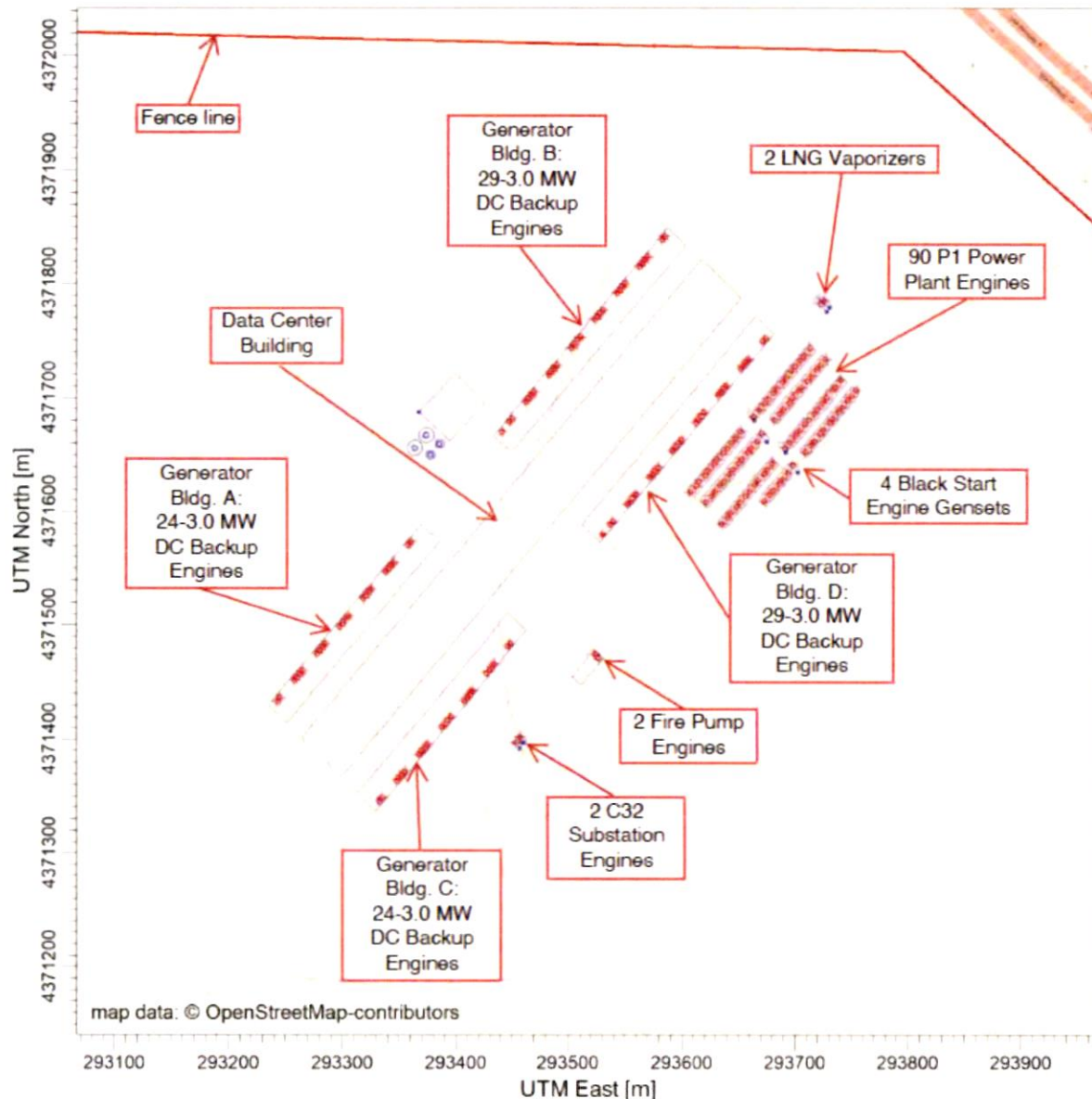


FIGURE 4. AERMOD FACILITY CONFIGURATION

4.4 Background Concentrations and Offsite Sources

Dispersion modeling analyses require evaluation of appropriate background concentrations along with modeled impacts of a proposed facility and nearby facilities. For this analysis, the NDEP "pristine" background concentrations were used for PM_{2.5} and PM₁₀. These concentrations are recommended by NDEP for Storey County as the area is removed from urban sources of anthropogenic pollutants. NDEP does not require the addition of background concentrations for gaseous air pollutants. The background concentrations used in this analysis are shown in Table 1.

NDEP does not require the inclusion of nearby facility sources for the analysis of impacts in Storey County. No nearby sources were included in the analysis.

TABLE 1 BACKGROUND CONCENTRATIONS		
Pollutant	Averaging Period	Background Concentration (µg/m³)
CO	All	0
NO ₂	All	0
SO ₂	All	0
PM _{2.5}	24-hour	8
PM _{2.5}	Annual	2.3
PM ₁₀	24-hour	10.2

Source: NDEP/BAPC

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR §50.1(e) and NDEP guidance. Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access.

Because the Facility is located in a mountainous region, initially a large grid of receptors, measuring out to 50 kilometers (km) from the Facility sources, was modeled in AERMOD for 1-hour (hr) NO₂ and 24-hr PM_{2.5} to ensure that maximum impacts are captured. This initial modeling helped to determine that a receptor grid extending out to 10 km from the Facility sources is more than sufficient to capture maximum impacts for all pollutants/averaging times.

To complete air dispersion modeling, Cartesian receptor grids were developed following NDEP modeling guidance and defined using UTM WGS84 Zone 11. For the NvAAQS modeling analysis, a nested receptor grid was developed to evaluate the effects of the proposed Facility in the area surrounding the Facility. The receptor spacing is as follows:

- 25 m spacing on the Facility boundary;
- 100 m gridded receptor spacing extending from the Facility boundary to approximately 2 kilometers (km) from the Facility boundary;
- 200 m gridded receptor spacing extending from approximately 2 km to approximately 4 km from the Facility boundary; and
- 500 m gridded receptor spacing extending from approximately 4 km to approximately 10 km from the Facility boundary.

In total, 6,452 receptors were included in the modeling analysis. Figure 5 shows the receptor grid used for the NvAAQS modeling analysis.

For Increment Tracking modeling, receptor grids were provided by NDEP. The increment grids consist of receptors spaced 500 m apart covering the Air Quality Hydrographic Areas (HAs) in or near which the Facility will be located (HA-83 and HA-102). Figures 6 and 7 show the receptor grids used for the Increment Tracking analysis. Note that onsite receptors were not included in the Increment Tracking modeling analysis.

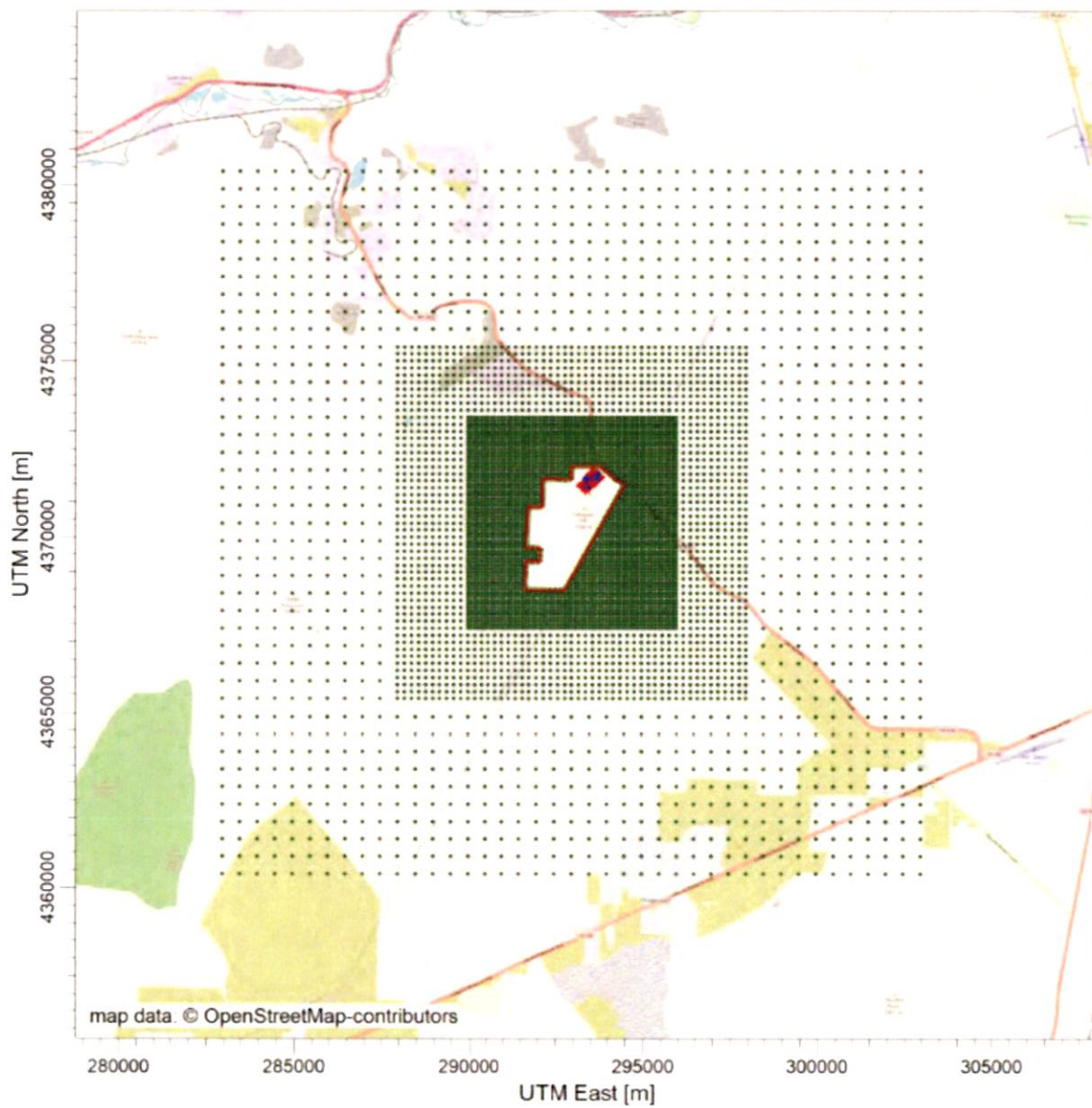


FIGURE 5. RECEPTORS FOR NVAQS ANALYSIS

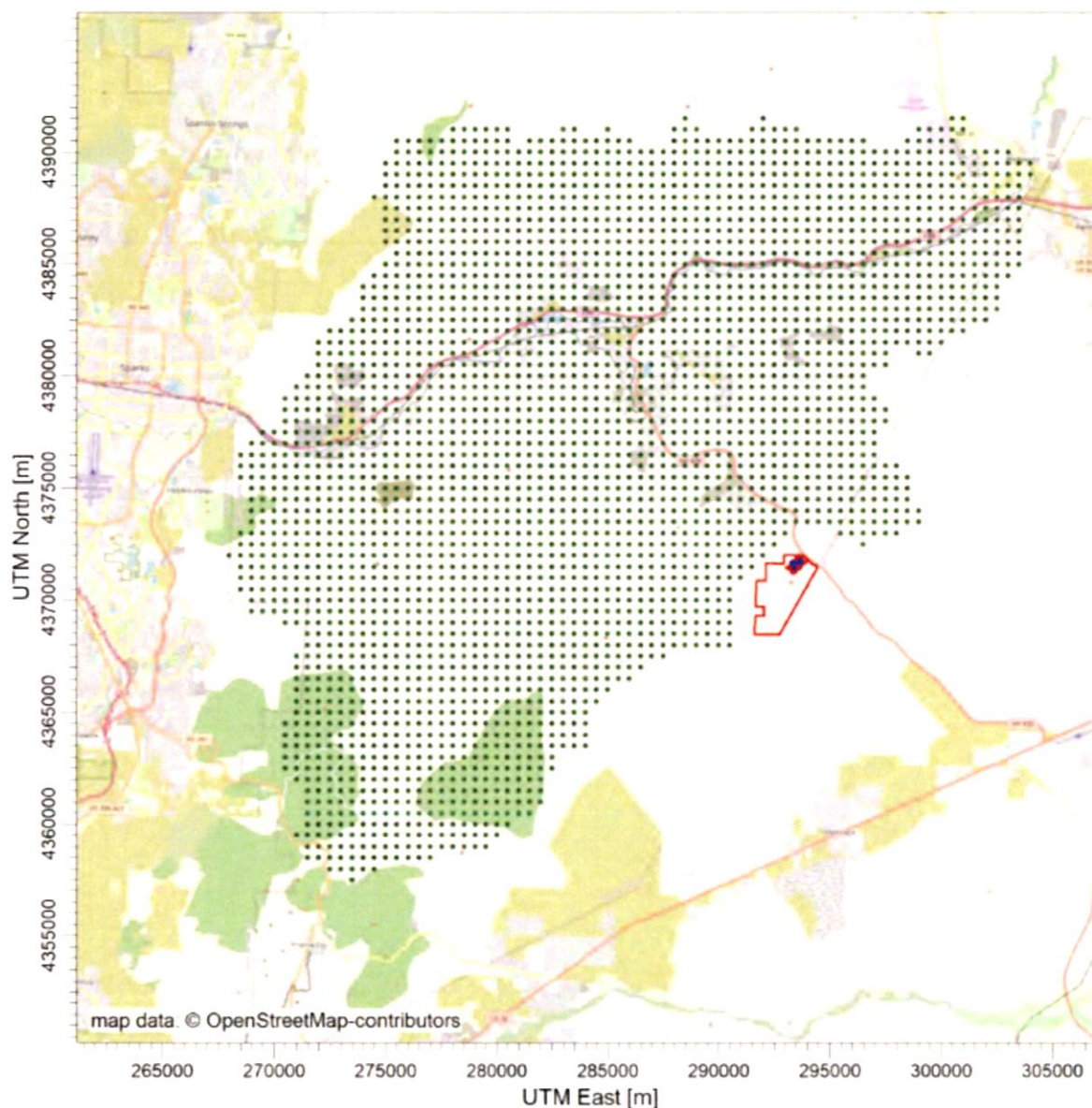


FIGURE 6. RECEPTORS FOR INCREMENT ANALYSIS (HA-83 GRID)

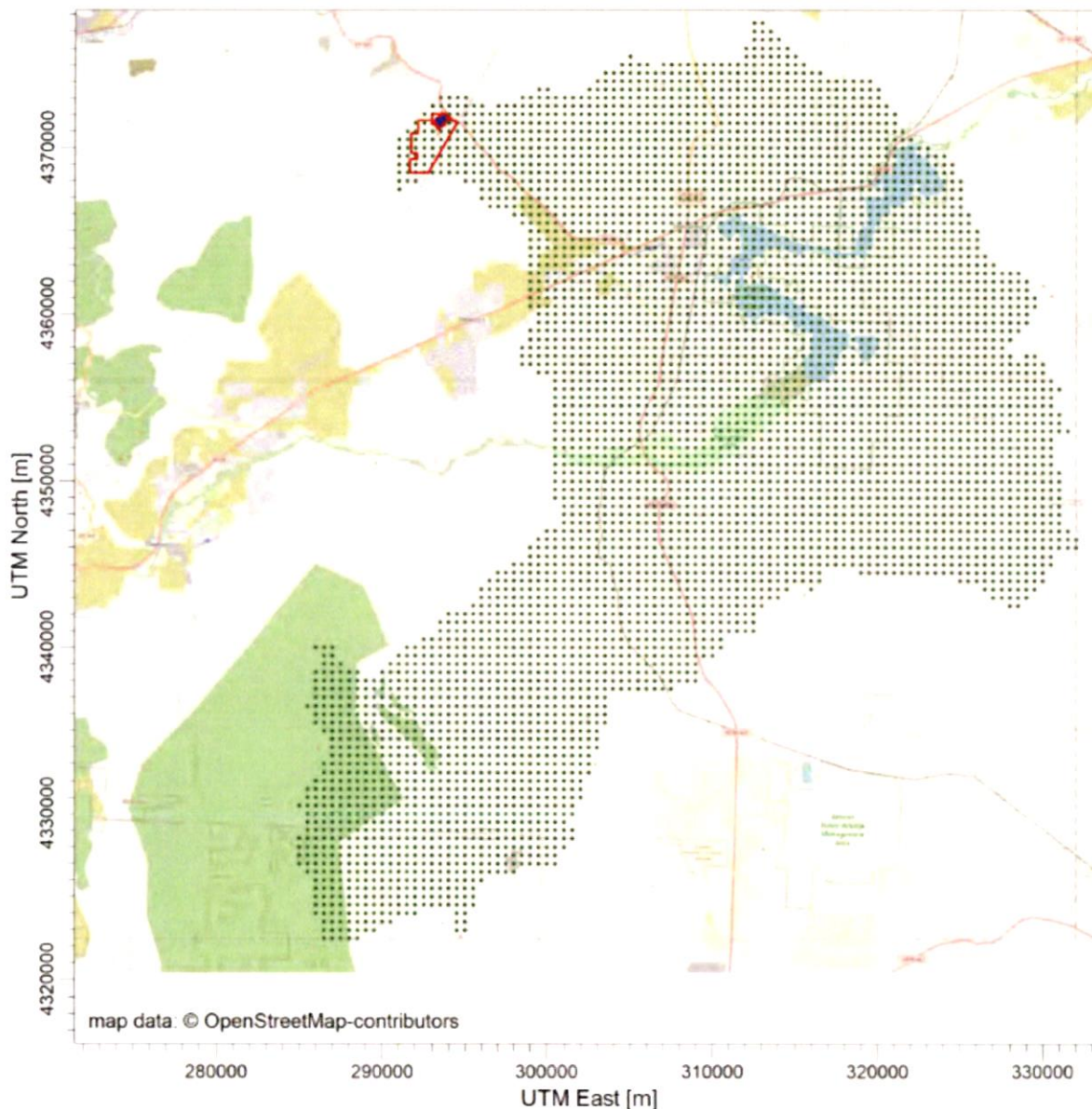


FIGURE 7. RECEPTORS FOR INCREMENT ANALYSIS (HA-102 GRID)

4.6 Terrain Data

The AERMOD model requires receptor elevation inputs to calculate impacts in simple terrain above stack base and in complex terrain above the stack height. Receptor elevations were developed using the National Elevation Dataset (NED) data. The NED data was converted to GeoTIFF format and processed using the Lakes Environmental AERMOD View Graphic User Interface (GUI) with AERMAP. NED data were processed at 1 arc-sec resolution; receptor terrain values were interpolated from the nearest NED grid points. Receptor base elevations for the increment modeling grid were

included in the file received from NDEP. Source and building base elevations were set to the base elevations listed in the site maps.

4.7 Meteorological Data

For the NvAAQS modeling analysis, NDEP provided a meteorological dataset consisting of one year (2019) of meteorological data collected at the Tracy met station, coupled with upper-air data collected by the National Weather Service at Reno, Nevada. The data were processed by NDEP using AERMET (version 23132), and NDEP provided SV RNO and BlueScape with AERMOD-ready surface and profile files for the year 2019. The adjust-u* option was used in the construction of the meteorological record.

A wind rose for the Tracy met station is shown in Figure 8. The wind rose shows an average wind speed of 2.76 meters per second (m/sec), with a predominant wind flow from the west and southwest and a secondary wind flow from the east. The Tracy 2019 meteorological data was used with an anemometer height of 10 m and a base elevation of 1,308 m.

For the increment modeling analysis, NDEP provided four meteorological datasets, each consisting of one year of meteorological data collected at the Tracy and Fort Churchill met stations, coupled with upper-air data collected by the National Weather Service at Reno, Nevada. The following meteorological datasets were used for the increment modeling analysis:

- HA-83: The 2009 and 2010 datasets were used to analyze annual NO₂ and annual PM₁₀ incremental impacts. The 2011 and 2012 datasets were used to analyze 24-hour PM₁₀ impacts.
- HA-102: The 1996 and 1997 Fort Churchill datasets were used to analyze annual NO₂ incremental impacts.

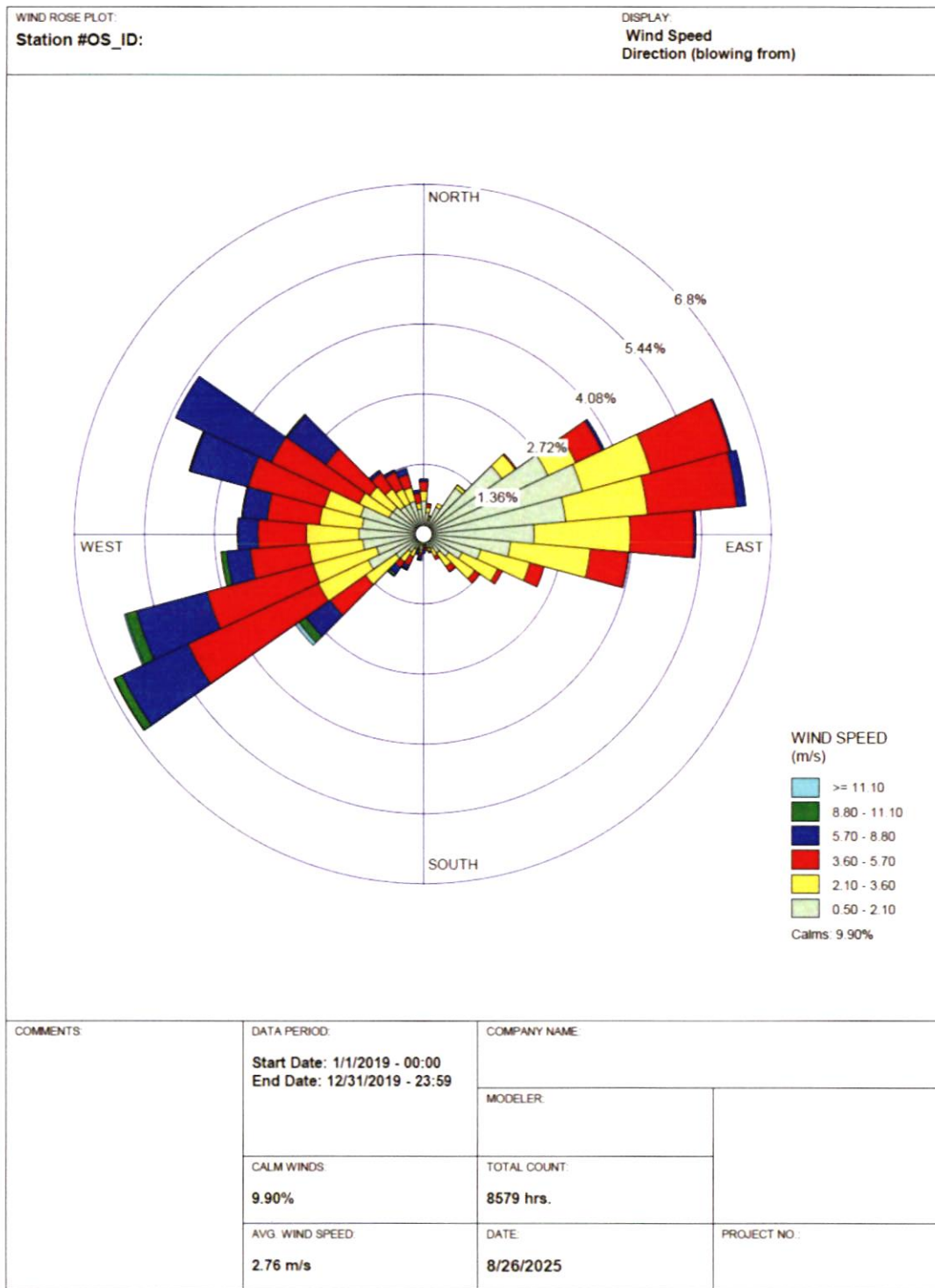


FIGURE 8. WIND ROSE FOR TRACY MET STATION (2019)

5.0 MODELING METHODOLOGY

5.1 Pollutants Subject to Review

All criteria pollutants except VOC were modeled using AERMOD and evaluated for NvAAQS compliance and for the NO₂ and PM₁₀ Increment Tracking analysis. The pollutants analyzed for NvAAQS compliance are NO₂, CO, PM_{2.5}, PM₁₀, and SO₂. Modeling for VOC, an ozone precursor, was not performed using AERMOD because NDEP requires VOC to be analyzed using USEPA's ozone analysis entitled *VOC/NO_x Point Source Screening Tables*, by Richard D. Scheffe (or the Scheffe Method). Details of the screening ozone analysis performed are discussed in Section 6.4.

5.2 Modeling Scenarios

For both NvAAQS and Increment analysis modeling, all of the engine sources were modeled using stack parameters and emission rates at 100% load. See the Permit Application Report for more details on emission calculations. All sources were modeled using no variable emission scenarios. All of the sources were assumed to be operating for every hour of the day and year (24 hours per day, 8,760 hours per year).

5.2.1 Modeling Scenarios for the NvAAQS Analysis

In all of the analyses, it was assumed that all sources would be running at one time. For all short-term modeling analyses, the model input emission rates from each of the 90 P1 Power Plant gas engines were the maximum hourly emissions at 100% load for each engine. For all long-term analyses, the model input emission rates from each of the 90 P1 Plant gas engines were the maximum hourly emissions, de-rated to account for high altitude of the site with a 10% safety factor. For all short- and long-term modeling analyses, the model input emission rates from each the two LNG vaporizers were the maximum hourly emissions for each unit.

For the 1-hour NO₂ and 1-hour SO₂ modeling, the model input emission rates from each of the 106 x 3.0 MW DC engines, four BSE gensets and two Substation engines were annualized by evenly spreading the fuel usage and maximum hourly emissions of the equivalent of 100 hours per year of operation at 100% load for each engine over 8,760 hours of the year. For the fire pump engines, the model input emission rates were annualized similarly, but for the equivalent of 40 hours per year of operation at 100% load. These annualized emission rates were then entered into AERMOD for each stack and then modeled for the NvAAQS analysis.

For the annual NO₂; 24-hour and annual PM₁₀; 24-hour and annual PM_{2.5}; 3-hour, 24-hour and annual SO₂; and 1-hour and 8-hour CO impacts, the maximum hourly emissions for each diesel engine stack were input into AERMOD.

For the annual NO₂, annual PM₁₀ and annual PM_{2.5} modeling, the diesel engines were modeled in a separate model run than the P1 Power Plant gas engines and the vaporizers. Then, for the diesel engines, a post-modeling analysis was completed in

Excel spreadsheets where the high-first-high (H1H) through high-eighth-high (H8H) 1-hour modeled impact results were averaged at each receptor (for annual SO₂ modeling, only the H1H results were used), then multiplied by 100 hours per year / 8,760 total hours per year at each receptor. Then, the annual average modeled impacts from the P1 Plant gas engines and vaporizers at each receptor were added to the calculated diesel engine impacts.

For the short-term (non-annual) runs, the modeled results were in the form of the standard (e.g. H8H for 24-hour PM_{2.5}). The Air Dispersion Modeling Scenarios table in Attachment B shows the scenarios for each pollutant/averaging time for the NvAAQS analysis.

5.2.2 Modeling Scenarios for the Increment Tracking Analysis

The Increment Tracking analysis analyzed annual NO₂ and 24-hour/annual PM₁₀ impacts using baseline inventories (as concentrations in µg/m³) for the meteorological years that were modeled for each pollutant/averaging time (HA-83: 2009/2010 for annual NO₂ and PM₁₀; 2011/2012 for 24-hour PM₁₀ and HA-102: 1996/1997 for annual NO₂). These baseline inventories, received from NDEP, are representative of the existing increment consumption of these pollutants for each averaging time at the location of the receptors in hydrogeographic grids 83 and 102 (or HA-83 and HA-102 grids) for each of the meteorological data years.

To run the Increment Tracking analysis for annual NO₂ and 24-hour/annual PM₁₀, the annual average (or annualized) emission rates for the diesel engines (calculated as 40 or 100 hours per year / 8,760 hours per year multiplied by the maximum 1-hour NO₂ and PM₁₀ emission rates) and the maximum hourly emission rates for the P1 Power engines and vaporizers were entered into AERMOD for each stack and each meteorological data year was run separately in AERMOD for each hydrogeographic area. The results from these AERMOD runs were analyzed at each HA-83 and HA-102 grid receptor to determine if the receptor is within the Facility fenceline boundary. The modeled impact at each receptor that is outside of the Facility fenceline boundary was added to that receptor's baseline existing increment consumption value. Then, each receptor was analyzed to determine if the modeled impact plus the existing concentration representing increment consumption is above the increment threshold for that pollutant/averaging time. The higher result at each receptor from either of the two meteorological years in the two hydrogeographic areas is reported as the Project impact. Increment thresholds are shown in Table 2. The Air Dispersion Modeling Scenarios table in Attachment B shows the scenarios for each pollutant/averaging time for the Increment Tracking analysis.

TABLE 2 NDEP INCREMENT TRACKING ANALYSIS THRESHOLDS	
Pollutant/Averaging Time	Increment Threshold ($\mu\text{g}/\text{m}^3$)
Annual NO_2	25
24-hour PM_{10}	30
Annual PM_{10}	17

5.3 Significant Impact Levels

To demonstrate that the Project will not cause or contribute to a NvAAQS exceedance, a criteria pollutant air dispersion modeling analysis can be conducted in two steps: an initial or significant impact analysis (SIA), and a NvAAQS analysis, if a SIL is exceeded and is necessary. For this analysis, SV RNO opted not to perform the SIA. All pollutants/averaging times were evaluated for the NvAAQS analysis.

5.4 NvAAQS Analysis

An air dispersion modeling analysis is required to assess NvAAQS compliance for regulated NSR pollutants. If initial modeling for attainment pollutants exceeds a SIL, then a NvAAQS analysis is required. Because a SIA was not performed for this analysis, all pollutants were initially modeled for the NvAAQS. Table 3 shows the primary NvAAQS, with modeling design basis, for NO_2 , PM_{10} , $\text{PM}_{2.5}$, SO_2 , and CO.

TABLE 3 NEVADA AMBIENT AIR QUALITY STANDARDS (NVAQS)		
Pollutant	Modeling Design Basis	NvAAQS ($\mu\text{g}/\text{m}^3$)
NO_2	1-hour (Diesel Engines): Annualized Emission Rate Input; 1-hour (P1 Prime Engines and Vaporizers): Max. Hourly Rate Input; Maximum 1-hour Average Concentration 98 th Percentile (H8H) At each receptor over the one year modeled	188
	Annual (Diesel Engines): 1-hour Average Concentration Ranks H1H to H8H x 100/8,760 Annual (P1 Prime Engines and Vaporizers): Annual Average	100
PM_{10}	24-hour: 24-hour Average Concentration Highest (H2H) at each receptor over the one year modeled	150
	Annual (Diesel Engines): 1-hour Average Concentration Ranks H1H to H8H x 100/8,760 Annual (P1 Prime Engines and Vaporizers): Annual Average	50
$\text{PM}_{2.5}$	24-hour: 24-hour Average Concentration 98 th Percentile (H8H) Average at each receptor over the one year modeled	35
	Annual (Diesel Engines): 1-hour Average Concentration Ranks H1H to H8H x 100/8,760 Annual (P1 Prime Engines and Vaporizers): Annual Average	12

TABLE 3 NEVADA AMBIENT AIR QUALITY STANDARDS (NVAAQS)		
Pollutant	Modeling Design Basis	NvAAQS ($\mu\text{g} / \text{m}^3$)
SO ₂	1-hour (Diesel Engines): Annualized Emission Rate Input; 1-hour (P1 Prime Engines and Vaporizers): Max. Hourly Rate Input; H4H, 1-hour average	196
	3-hour: H1H 3-hour average	1,300
	24-hour: H1H 24-hour average	365
	Annual (Diesel Engines): 1-hour average (H1H) x 100/8,760 Annual (P1 Prime Engines and Vaporizers): Annual Average	80
CO	1-hour: H1H 8-hour average	40,500
	8-hour (Elev. <5,000 ft above sea level): H1H 8-hour average	10,500
	8-hour (Elev. >5,000 ft above sea level): H1H 8-hour average	7,000

5.5 NO₂ Analysis

Following USEPA guidance (USEPA 2017), the NO₂ modeling analyses used the recommended three tier screening approach. Tier 1 was not employed, with the conservative assumption that 100% of the available NO_x converts to NO₂. The Tier 2 (Ambient Ratio Method, or ARM2) was employed with the USEPA recommended minimum and maximum ambient NO₂/NO_x ratios of 0.5 and 0.9 respectively. Tier 3, which accounts for the chemical reactions that convert NO_x to NO₂ in the presence of ozone, was not employed.

6.0 MODEL RESULTS

Modeling results are presented below. AERMOD input and output files are provided electronically.

6.1 Scenario Analysis Results

The long-term average annual emission rates modeled for NO₂, PM₁₀, PM_{2.5} and SO₂ and the short-term 1-hour, 3-hour, 8-hour and 24-hour emission rates and operating conditions modeled for NO₂, PM₁₀, PM_{2.5}, SO₂ and CO are shown in Attachment B.

6.2 NvAAQS Analysis Results

A NvAAQS analysis was conducted to assess compliance with the 24-hour and annual PM_{2.5}, 24-hour and annual PM₁₀, 1-hour and annual NO₂, 1-hour, 3-hour, 24-hour and annual SO₂ and 1-hour and 8-hour CO NvAAQS. As required by NDEP, background concentrations listed in Table 1 were added to the model results for 24-hour and annual PM_{2.5} and 24-hour PM₁₀. As shown in Table 1, NDEP does not require background concentrations to be added to modeled results for NvAAQS evaluation of

the gaseous pollutants NO₂, SO₂ or CO. Table 3 in Section 5.4 shows the form of the standard for each pollutant.

The results of the NvAAQS analysis are presented in Table 4 and show pollutant emissions from the Project will not cause or contribute to exceedance of the NvAAQS.

TABLE 4 NVAAQS IMPACTS ANALYSIS RESULTS					
Pollutant/Avg. Period	Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	Standard (µg/m³)	Exceed NvAAQS?
PM _{2.5} 24-hour	13.6	8.0	21.6	35	No
PM _{2.5} Annual	1.94	2.3	4.24	12.0	No
PM ₁₀ 24-hour	20.0	10.2	30.2	150	No
PM ₁₀ Annual	1.94	0	1.94	50	No
NO ₂ 1-hour	138	0	138	188	No
NO ₂ Annual	12.1	0	12.1	100	No
SO ₂ 1-hour	69.6	0	69.6	196	No
SO ₂ 3-hour	58.6	0	58.6	1,300	No
SO ₂ 24-hour	14.8	0	14.8	365	No
SO ₂ Annual	2.17	0	2.17	80	No
CO 1-hour	1,722	0	1,722	40,500	No
CO 8-hour	256	0	256	10,500	No

6.3 Increment Tracking Modeling Analysis Results

Increment Tracking modeling results for annual NO₂ and 24-hour and annual PM₁₀ at the point of maximum impact are presented in Table 5. An electronic copy of the Excel file where calculations were made at each receptor is included with the application package. The only reason why 24-hour PM₁₀ impacts show an exceedance of the increment limits is because the existing increment consumption concentrations at these receptors already exceeded the increment limits. Modeled concentrations from the Project at these receptors did not exceed the SILs, so the Project is not considered to contribute to increment threshold exceedances. The modeling analysis demonstrates the Project's compliance with NDEP's Increment Tracking program.

TABLE 5
SOUTH VALLEY INCREMENT MODELING RESULTS

Offsite PMI Receptor #	HA Area	Modeled Concentrations (µg/m³)		SIL (µg/m³)	Project Exceeds SIL?	Existing Increment Consumption (µg/m³)		Total Concentration (µg/m³)		Increment Limit (µg/m³)	Exceeds Limit?
		Met Year 1	Met Year 2			Met Year 1	Met Year 2	Met Year 1	Met Year 2		
Annual NO ₂											
1756	HA-83	0.043	0.054	1	No	19.5	17.1	19.5	17.2	25	No
3206	HA-102	0.013	0.013	1	No	3.13	3.10	3.14	3.11	25	No
Annual PM ₁₀											
1597	HA-83	0.010	0.012	1	No	9.61	9.31	9.62	9.32	17	No
24-hour PM ₁₀											
1541	HA-83	0.085	0.063	5	No	36.1	30.8	36.1	30.9	30	Yes*

*Exceeds Increment Limit only because of existing increment consumption. Project impacts do not exceed the SIL and are negligible.

6.4 Ozone Analysis

As with the pollutants discussed above, ozone concentrations are regulated under the NvAAQS. However, ozone is a secondary pollutant formed in the atmosphere by reaction of precursor species, rather than being directly emitted by facilities. As such, AERMOD is not an appropriate tool to assess ozone impacts as AERMOD does not capture the complex chemistry needed to simulate ozone. Instead, a screening analysis is performed to determine ozone impacts from the proposed Facility.

The Scheffe screening tables were used to evaluate the Facility's ozone contribution to demonstrate compliance with the 1-hour ozone NvAAQS. A Facility contribution of 0.009 ppm ozone was obtained. This is lower than the NvAAQS of 0.070 ppm. Accordingly, the NvAAQS have been satisfied for ozone.

The Scheffe screening calculations are shown in Attachment C.

7.0 CONCLUSIONS

The results of this air dispersion modeling analysis demonstrate that the proposed South Valley Technology Center Project will not cause or contribute to air pollution in violation of a NvAAQ Standard. As shown in Table 4, the NvAAQS are not exceeded. As shown in Table 5, an Increment Tracking modeling analysis demonstrates that the Project is in compliance with NDEP's Increment Tracking program. An ozone screening analysis determined that the Project is in compliance with the NvAAQS.

ATTACHMENT A
MODELING INPUTS

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	J420_01	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL	See Emission Rates in Att. B	293608.11	4371617.17
POINT	J420_02	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293612.63	4371622.63
POINT	J420_03	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293616.14	4371626.74
POINT	J420_04	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293620.83	4371632.19
POINT	J420_05	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293624.18	4371636.40
POINT	J420_06	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293628.58	4371641.67
POINT	J420_07	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293632.05	4371645.97
POINT	J420_08	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293636.77	4371651.52
POINT	J420_09	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293640.31	4371655.72
POINT	J420_10	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293644.78	4371661.11
POINT	J420_11	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293648.48	4371665.22
POINT	J420_12	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293652.77	4371670.41
POINT	J420_13	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293668.96	4371689.35
POINT	J420_14	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293673.28	4371694.60
POINT	J420_15	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293676.79	4371698.82
POINT	J420_16	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293681.18	4371704.27
POINT	J420_17	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293684.72	4371708.47
POINT	J420_18	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293689.43	4371713.64

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	J420_19	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL	See Emission Rates in Att. B	293693.00	4371718.14
POINT	J420_20	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293697.42	4371723.38
POINT	J420_21	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293701.26	4371727.49
POINT	J420_22	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293705.45	4371732.94
POINT	J420_23	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293709.05	4371737.36
POINT	J420_24	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293713.54	4371742.85
POINT	J420_25	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293621.93	4371608.42
POINT	J420_26	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293626.45	4371613.87
POINT	J420_27	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293630.01	4371618.20
POINT	J420_28	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293634.49	4371623.65
POINT	J420_29	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293638.01	4371627.42
POINT	J420_30	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293642.62	4371632.89
POINT	J420_31	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293646.09	4371637.19
POINT	J420_32	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293650.61	4371642.54
POINT	J420_33	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293654.15	4371646.75
POINT	J420_34	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293658.59	4371652.14
POINT	J420_35	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293662.18	4371656.35
POINT	J420_36	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293666.78	4371661.74

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	J420_37	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL	See Emission Rates in Att. B	293682.23	4371680.57
POINT	J420_38	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293686.95	4371685.72
POINT	J420_39	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293690.57	4371690.14
POINT	J420_40	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293695.06	4371695.59
POINT	J420_41	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293698.50	4371699.69
POINT	J420_42	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293703.11	4371705.16
POINT	J420_43	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293706.68	4371709.16
POINT	J420_44	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293711.30	4371714.71
POINT	J420_45	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293714.73	4371718.91
POINT	J420_46	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293719.34	4371724.37
POINT	J420_47	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293722.93	4371728.48
POINT	J420_48	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293727.22	4371733.87
POINT	J420_49	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293635.85	4371589.49
POINT	J420_50	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293640.37	4371594.84
POINT	J420_51	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293643.88	4371598.85
POINT	J420_52	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293648.48	4371604.31
POINT	J420_53	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293651.93	4371608.72
POINT	J420_54	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293656.54	4371613.99

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	J420_55	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL	See Emission Rates in Att. B	293660.11	4371618.08
POINT	J420_56	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293664.59	4371623.70
POINT	J420_57	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293668.02	4371627.60
POINT	J420_58	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293673.03	4371633.06
POINT	J420_59	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293676.12	4371637.57
POINT	J420_60	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293680.41	4371642.76
POINT	J420_61	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293696.41	4371661.57
POINT	J420_62	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293700.62	4371666.83
POINT	J420_63	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293704.44	4371671.04
POINT	J420_64	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293708.93	4371676.29
POINT	J420_65	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293712.68	4371680.70
POINT	J420_66	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293717.29	4371686.07
POINT	J420_67	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293720.66	4371690.06
POINT	J420_68	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293724.97	4371695.51
POINT	J420_69	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293728.51	4371700.02
POINT	J420_70	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293733.11	4371705.37
POINT	J420_71	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293736.40	4371709.68
POINT	J420_72	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293740.99	4371715.08

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	J420_73	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL	See Emission Rates in Att. B	293673.70	4371609.65
POINT	J420_74	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293678.17	4371615.13
POINT	J420_75	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293681.83	4371619.07
POINT	J420_76	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293686.31	4371624.64
POINT	J420_77	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293689.88	4371628.72
POINT	J420_78	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293694.35	4371634.14
POINT	J420_79	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293709.88	4371653.01
POINT	J420_80	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293714.47	4371658.59
POINT	J420_81	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293717.91	4371662.58
POINT	J420_82	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293722.52	4371668.08
POINT	J420_83	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293726.25	4371671.90
POINT	J420_84	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293730.71	4371677.52
POINT	J420_85	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293734.17	4371681.79
POINT	J420_86	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293738.63	4371687.35
POINT	J420_87	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293742.35	4371691.45
POINT	J420_88	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293746.77	4371697.02
POINT	J420_89	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293750.33	4371701.20
POINT	J420_90	Jenbacher J420 1.6 MW NG Engine	1688.6	7.62	0.509	44.07	710.372	VERTICAL		293754.77	4371706.38
POINT	VAP1	LNG Vaporizer	1688.6	6.71	0.8620	22.86	616.483	VERTICAL		293722.97	4371782.32

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	VAP2	LNG Vaporizer	1688.6	6.71	0.8620	22.86	616.483	VERTICAL	See Emission Rates in Att. B	293726.31	4371785.27
POINT	BSE1	1,370 kW Volvo Penta BSE Genset	1688.6	2.93	0.2835	58.02	705.372	VERTICAL		293664.18	4371683.01
POINT	BSE2	1,370 kW Volvo Penta BSE Genset	1688.6	2.93	0.2835	58.02	705.372	VERTICAL		293670.87	4371668.47
POINT	BSE3	1,370 kW Volvo Penta BSE Genset	1688.6	2.93	0.2835	58.02	705.372	VERTICAL		293691.89	4371655.47
POINT	BSE4	1,370 kW Volvo Penta BSE Genset	1688.6	2.93	0.2835	58.02	705.372	VERTICAL		293698.06	4371641.11
POINT	DC1A_01	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293360.39	4371573.30
POINT	DC1A_02	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293358.16	4371570.64
POINT	DC1A_03	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293345.48	4371555.53
POINT	DC1A_04	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293343.25	4371552.87
POINT	DC1A_05	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293340.60	4371549.70
POINT	DC1A_06	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293338.37	4371547.04
POINT	DC1A_07	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293325.69	4371531.94
POINT	DC1A_08	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293323.46	4371529.28
POINT	DC1A_09	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293320.80	4371526.12

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	DC1A_10	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL	See Emission Rates in Att. B	293318.57	4371523.45
POINT	DC1A_11	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293305.89	4371508.34
POINT	DC1A_12	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293303.66	4371505.69
POINT	DC1A_13	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293300.13	4371501.47
POINT	DC1A_14	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293297.89	4371498.81
POINT	DC1A_15	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293285.22	4371483.70
POINT	DC1A_16	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293282.98	4371481.04
POINT	DC1A_17	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293280.33	4371477.87
POINT	DC1A_18	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293278.10	4371475.21
POINT	DC1A_19	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293265.42	4371460.11
POINT	DC1A_20	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293263.19	4371457.45
POINT	DC1A_21	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293260.54	4371454.28

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	DC1A_22	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL	See Emission Rates in Att. B	293258.30	4371451.63
POINT	DC1A_23	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293245.62	4371436.52
POINT	DC1A_24	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293243.39	4371433.86
POINT	DC1B_01	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293585.34	4371841.86
POINT	DC1B_02	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293583.11	4371839.20
POINT	DC1B_03	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293570.43	4371824.09
POINT	DC1B_04	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293568.20	4371821.43
POINT	DC1B_05	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293565.54	4371818.27
POINT	DC1B_06	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293563.31	4371815.61
POINT	DC1B_07	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293550.64	4371800.50
POINT	DC1B_08	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293548.41	4371797.84
POINT	DC1B_09	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293545.75	4371794.67

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	DC1B_10	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL	See Emission Rates in Att. B	293543.52	4371792.01
POINT	DC1B_11	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293530.85	4371776.91
POINT	DC1B_12	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293528.62	4371774.12
POINT	DC1B_13	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293525.96	4371770.96
POINT	DC1B_14	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293523.73	4371768.30
POINT	DC1B_15	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293511.06	4371753.19
POINT	DC1B_16	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293508.83	4371750.53
POINT	DC1B_17	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293505.29	4371746.32
POINT	DC1B_18	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293503.07	4371743.67
POINT	DC1B_19	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293490.39	4371728.56
POINT	DC1B_20	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293488.16	4371725.90
POINT	DC1B_21	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293485.50	4371722.73

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	DC1B_22	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL	See Emission Rates in Att. B	293483.27	4371720.08
POINT	DC1B_23	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293470.60	4371704.97
POINT	DC1B_24	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293468.36	4371702.31
POINT	DC1B_25	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293465.71	4371699.13
POINT	DC1B_26	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293463.48	4371696.47
POINT	DC1B_27	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293450.80	4371681.36
POINT	DC1B_28	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293448.57	4371678.70
POINT	DC1B_29	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293441.50	4371670.27
POINT	DC1C_01	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293332.75	4371345.95
POINT	DC1C_02	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293335.02	4371348.57
POINT	DC1C_03	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293347.98	4371363.45
POINT	DC1C_04	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293350.28	4371366.05

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	DC1C_05	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL	See Emission Rates in Att. B	293353.01	4371369.18
POINT	DC1C_06	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293355.24	4371371.80
POINT	DC1C_07	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293367.91	4371386.91
POINT	DC1C_08	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293370.16	4371389.58
POINT	DC1C_09	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293372.82	4371392.73
POINT	DC1C_10	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293375.04	4371395.39
POINT	DC1C_11	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293387.74	4371410.50
POINT	DC1C_12	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293389.98	4371413.15
POINT	DC1C_13	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293393.53	4371417.37
POINT	DC1C_14	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293395.77	4371420.03
POINT	DC1C_15	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293407.56	4371434.07
POINT	DC1C_16	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293409.80	4371436.72

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	DC1C_17	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL	See Emission Rates in Att. B	293412.46	4371439.89
POINT	DC1C_18	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293414.69	4371442.55
POINT	DC1C_19	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293427.37	4371457.65
POINT	DC1C_20	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293429.60	4371460.31
POINT	DC1C_21	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293432.28	4371463.47
POINT	DC1C_22	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293434.51	4371466.13
POINT	DC1C_23	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293447.20	4371481.24
POINT	DC1C_24	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293449.43	4371483.89
POINT	DC1D_01	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293530.60	4371580.42
POINT	DC1D_02	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293537.67	4371588.84
POINT	DC1D_03	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293539.90	4371591.50
POINT	DC1D_04	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293552.58	4371606.61

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	DC1D_05	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL	See Emission Rates in Att. B	293554.81	4371609.27
POINT	DC1D_06	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293557.47	4371612.43
POINT	DC1D_07	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293559.70	4371615.09
POINT	DC1D_08	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293572.38	4371630.20
POINT	DC1D_09	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293574.61	4371632.86
POINT	DC1D_10	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293577.26	4371636.02
POINT	DC1D_11	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293579.50	4371638.68
POINT	DC1D_12	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293592.17	4371653.78
POINT	DC1D_13	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293594.40	4371656.44
POINT	DC1D_14	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293597.94	4371660.66
POINT	DC1D_15	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293600.17	4371663.31
POINT	DC1D_16	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293612.84	4371678.42

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	DC1D_17	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL	See Emission Rates in Att. B	293615.08	4371681.08
POINT	DC1D_18	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293617.73	4371684.24
POINT	DC1D_19	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293619.96	4371686.90
POINT	DC1D_20	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293632.64	4371702.01
POINT	DC1D_21	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293634.87	4371704.67
POINT	DC1D_22	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293637.52	4371707.83
POINT	DC1D_23	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293639.75	4371710.49
POINT	DC1D_24	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293652.43	4371725.59
POINT	DC1D_25	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293654.66	4371728.25
POINT	DC1D_26	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293657.31	4371731.42
POINT	DC1D_27	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293659.54	4371734.07
POINT	DC1D_28	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL		293672.22	4371749.18

SOUTH VALLEY FACILITY SOURCE PARAMETERS											
Type	ID	Description	Base Elev (m)	Height (m)	Diam (m)	Exit Vel (m/s)	Exit Temp (K)	Release Type	Emission Rate (g/s)	UTM Location	
										X (m)	Y (m)
POINT	DC1D_29	CAT 3516E 3.0 MW Diesel Emergency Engine	1689.8	18.29	0.3048	147.51	756.483	VERTICAL	See Emission Rates in Att. B	293674.45	4371751.84
POINT	C32_1	CAT C32 1.25 MW Diesel Emergency Engine	1689.5	4.57	0.3048	64.72	703.483	VERTICAL		293454.36	4371397.32
POINT	C32_2	CAT C32 1.25 MW Diesel Emergency Engine	1689.5	4.57	0.3048	64.72	703.483	VERTICAL		293458.25	4371401.96
POINT	FIRE_1	Clarke C18H0 UFAD12 364 kW Fire Pump Engine	1689.5	6.25	0.2033	55.68	784.817	VERTICAL		293526.95	4371470.94
POINT	FIRE_2	Clarke C18H0 UFAD12 364 kW Fire Pump Engine	1689.5	6.25	0.2033	55.68	784.817	VERTICAL		293523.60	4371474.42

SOUTH VALLEY FACILITY BUILDING PARAMETERS										
Building ID	Description	Tier Number	Base Elevation (m)	Tier Height (m)	Diameter (m)	X Length (m)	Y Length (m)	Rotation Angle (deg)	UTM Location	
									X (m)	Y (m)
DC	Data Center Building	1	1689.81	18.29	--	--	--	--	293264.47	4371401.50
P1A	Power Building A	1	1689.81	10.97	--	--	--	--	293235.52	4371430.55
P1B	Power Building B	1	1689.81	10.97	--	--	--	--	293434.58	4371666.72
P1C	Power Building C	1	1689.81	10.97	--	--	--	--	293313.48	4371352.41
P1D	Power Building D	1	1689.81	10.97	--	--	--	--	293512.45	4371589.06
P1.1	J420 Gen Housing Building 1	1	1688.59	5.49	--	--	--	--	293604.89	4371619.36
P1.2	J420 Gen Housing Building 2	1	1688.59	5.49	--	--	--	--	293616.24	4371609.72
P1.3	J420 Gen Housing Building 3	1	1688.59	5.49	--	--	--	--	293632.36	4371592.02
P1.4	J420 Gen Housing Building 4	1	1688.59	5.49	--	--	--	--	293697.50	4371631.77
P1.5	J420 Gen Housing Building 5	1	1688.59	5.49	--	--	--	--	293665.37	4371691.73
P1.6	J420 Gen Housing Building 6	1	1688.59	5.49	--	--	--	--	293678.01	4371683.57
P1.7	J420 Gen Housing Building 7	1	1688.59	5.49	--	--	--	--	293692.97	4371663.83
P1.8	J420 Gen Housing Building 8	1	1688.59	5.49	--	--	--	--	293704.29	4371653.88
WATER	Water Building	1	1690.12	10.82	--	37.2	46.7	317	293367.34	4371687.51
C32GEN_1	CAT C32 Generator 1 Housing	1	1689.51	3.75	--	3.35	7.62	46	293457.50	4371391.91
C32GEN_2	CAT C32 Generator 2 Housing	1	1689.51	3.75	--	3.35	7.62	46	293461.38	4371396.66
BSGEN_1	Black Start Generator 1 Housing	1	1688.59	3.75	--	3.53	10.4	46	293664.72	4371680.19
BSGEN_2	Black Start Generator 2 Housing	1	1688.59	3.75	--	3.53	10.4	46	293675.53	4371661.55

SOUTH VALLEY FACILITY BUILDING PARAMETERS										
Building ID	Description	Tier Number	Base Elevation (m)	Tier Height (m)	Diameter (m)	X Length (m)	Y Length (m)	Rotation Angle (deg)	UTM Location	
									X (m)	Y (m)
BSGEN_3	Black Start Generator 3 Housing	1	1688.59	3.75	--	3.53	10.4	46	293692.28	4371652.43
BSGEN_4	Black Start Generator 4 Housing	1	1688.59	3.75	--	3.53	10.4	46	293703.01	4371633.87
VAP_1	Vaporizer 1 Housing	1	1688.59	4.11	--	2.99	15.9	48	293731.07	4371778.86
VAP_2	Vaporizer 2 Housing	1	1688.59	4.11	--	2.99	15.9	48	293728.21	4371775.89
FIRE	Fire Response Center Building	1	1689.51	5.49	--	--	--	--	293511.17	4371447.07
WTR_TNK1	Water Tank 1	1	1690.12	10.67	13.1	--	--	--	293364.02	4371656.12
WTR_TNK2	Water Tank 2	1	1690.12	10.67	13.1	--	--	--	293374.10	4371667.15
WTR_TNK3	Water Tank 3	1	1690.12	10.67	8.23	--	--	--	293377.70	4371650.02
WTR_TNK4	Water Tank 4	1	1690.12	10.67	8.23	--	--	--	293385.69	4371659.57

ATTACHMENT B

MODELING SCENARIOS AND EMISSION RATES

SOUTH VALLEY FACILITY MODELING P1 GAS ENGINE EMISSION RATES PER STACK (G/SEC)						
Period	Analysis Description	NO ₂	CO	SO ₂	PM ₁₀	PM _{2.5}
Annual	NvAAQS and Increment (Maximum Hourly Emissions)	0.0283	--	0.00845	0.00563	0.00563
24-hour	NvAAQS and Increment (Maximum Hourly Emissions)	--	--	0.00894	0.00596	0.00596
8-hour	NvAAQS (Maximum Hourly Emissions)	--	0.0310	--	--	--
3-hour	NvAAQS (Maximum Hourly Emissions)	--	--	0.00894	--	--
1-hour	NvAAQS (Maximum Hourly Emissions)	0.0299	0.0310	0.00894	--	--

SOUTH VALLEY FACILITY MODELING LNG VAPORIZER EMISSION RATES PER STACK (G/SEC)						
Period	Analysis Description	NO ₂	CO	SO ₂	PM ₁₀	PM _{2.5}
Annual	NvAAQS and Increment (Maximum Hourly Emissions)	0.242	--	0.00393	0.0491	0.0491
24-hour	NvAAQS and Increment (Maximum Hourly Emissions)	--	--	0.00393	0.0491	0.0491
8-hour	NvAAQS (Maximum Hourly Emissions)	--	0.242	--	--	--
3-hour	NvAAQS (Maximum Hourly Emissions)	--	--	0.00393	--	--
1-hour	NvAAQS (Maximum Hourly Emissions)	0.242	0.242	0.00393	--	--

SOUTH VALLEY FACILITY MODELING BLACK START ENGINE GENSET EMISSION RATES PER STACK (G/SEC)

Period	Analysis Description	NO₂	CO	SO₂	PM₁₀	PM_{2.5}
Annual	Increment (Annualized Emissions)	0.00174	--	--	5.95E-05	--
	NvAAQS (Maximum Hourly Emissions)	0.152	--	0.00270	0.00521	0.00521
24-hour	Increment (Annualized Emissions)	--	--	--	5.95E-05	--
	NvAAQS (Maximum Hourly Emissions)	--	--	0.00270	0.00521	0.00521
8-hour	NvAAQS (Maximum Hourly Emissions)	--	0.0251	--	--	--
3-hour	NvAAQS (Maximum Hourly Emissions)	--	--	0.00270	--	--
1-hour	NvAAQS CO (Maximum Hourly Emissions) NO ₂ and SO ₂ (Annualized Emissions)	0.00174	0.0251	3.08E-05	--	--

SOUTH VALLEY FACILITY MODELING DC ENGINE EMISSION RATES PER STACK (G/SEC)

Period	Analysis Description	NO₂	CO	SO₂	PM₁₀	PM_{2.5}
Annual	Increment (Annualized Emissions)	0.00471	--	--	0.000278	--
	NvAAQS (Maximum Hourly Emissions)	0.412	--	0.00536	0.0244	0.0244
24-hour	Increment (Annualized Emissions)	--	--	--	0.000278	--
	NvAAQS (Maximum Hourly Emissions)	--	--	0.00536	0.0244	0.0244
8-hour	NvAAQS (Maximum Hourly Emissions)	--	0.161	--	--	--
3-hour	NvAAQS (Maximum Hourly Emissions)	--	--	0.00536	--	--
1-hour	NvAAQS CO (Maximum Hourly Emissions) NO ₂ and SO ₂ (Annualized Emissions)	0.00471	0.161	6.12E-05	--	--

SOUTH VALLEY FACILITY MODELING SUBSTATION ENGINE EMISSION RATES PER STACK (G/SEC)						
Period	Analysis Description	NO ₂	CO	SO ₂	PM ₁₀	PM _{2.5}
Annual	Increment (Annualized Emissions)	0.0330	--	--	0.000106	--
	SIL and NvAAQS (Maximum Hourly Emissions)	2.89	--	0.00229	0.00931	0.00931
24-hour	Increment (Annualized Emissions)	--	--	--	0.000106	--
	SIL and NvAAQS (Maximum Hourly Emissions)	--	--	0.00229	0.00931	0.00931
8-hour	SIL and NvAAQS (Maximum Hourly Emissions)	--	0.0978	--	--	--
3-hour	SIL and NvAAQS (Maximum Hourly Emissions)	--	--	0.00229	--	--
1-hour	SIL and NvAAQS CO (Maximum Hourly Emissions) NO ₂ and SO ₂ (Annualized Emissions)	0.0330	0.0978	2.61E-05	--	--

SOUTH VALLEY FACILITY MODELING FIRE PUMP ENGINE EMISSION RATES PER STACK (G/SEC)						
Period	Analysis Description	NO ₂	CO	SO ₂	PM ₁₀	PM _{2.5}
Annual	Increment (Annualized Emissions)	0.00136	--	--	9.19E-05	--
	SIL and NvAAQS (Maximum Hourly Emissions)	0.297	--	0.126	0.0201	0.0201
24-hour	Increment (Annualized Emissions)	--	--	--	9.19E-05	--
	SIL and NvAAQS (Maximum Hourly Emissions)	--	--	0.126	0.0201	0.0201
8-hour	SIL and NvAAQS (Maximum Hourly Emissions)	--	0.192	--	--	--
3-hour	SIL and NvAAQS (Maximum Hourly Emissions)	--	--	0.126	--	--
1-hour	SIL and NvAAQS CO (Maximum Hourly Emissions) NO ₂ and SO ₂ (Annualized Emissions)	0.00136	0.192	0.000576	--	--

ATTACHMENT C
SCHEFFE OZONE CALCULATIONS

South Valley Technology Center
Ozone Emissions Calculations - Scheffe Method
February 24, 2026

Scheffe Table Ozone Estimation

<https://ndep.nv.gov/uploads/air-permitting-docs/scheffe-model.pdf>

Parameter	Value	Note
Estimated Daily Max. VOC Emission Rate (ton/day)	0.1177	Based on PTE divided by 365 days in a year
Annual Estimated VOC Emission Rate (tpy)	42.96	
Annual Estimated NOx Emission Rate (tpy)	130.5	
Ratio VOC/NOx Emissions	0.32919	Since Ratio is <5.2, used column 3 in Scheffe screening table (below)
Annual VOC Emissions from Max. Daily Rate (tpy)	42.96	Annual total based on the maximum daily rate multiplied by 365
Ozone increase - Interpolate to 42.96 tpy VOC (pphm)	0.945	
Ozone Increase (ppm)	0.009	pphm * 0.01 = ppm
Federal Ozone NAAQS/Nevada Standard (NAC 445B.22097) (ppm)	0.070	
Exceeds NAAQS/NvAAQS?	No	

Scheffe Method, Table 1. Ozone Increment as a function of NMOC emissions and NMOC/NOx ratios.

Tons NMOC/Tons NOx (PPMC/PPM)

Rural (<5.2 NMOC/NOx ratio)

VOC (NMOC) Emissions (TPY)	pphm	ppm
50	1.1	0.011
75	1.2	0.012
100	1.4	0.014
300	1.7	0.017
500	1.9	0.019
750	2.3	0.023
1000	2.7	0.027
1500	3.3	0.033
2000	3.7	0.037
3000	4.3	0.043
5000	4.8	0.048
7500	5.1	0.051
10000	5.4	0.054

* multiply pphm by 0.01 to obtain ppm