



June 16, 2025

Colorado Department of Public Health and Environment
Air Pollution Control Division
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Re: QTS DEN1 DC2-3 Expansion
Construction Permit Modification Application
Environmental Justice Verification Number: 85951906
Permit Number: 22AR0210
Plant AIRS ID: 005-1777
Denver, Colorado

Dear Air Pollution Control Division:

QTS Aurora, LLC (QTS) is permitted to construct and operate 40 Kohler diesel-fired emergency generators (GEN001 – GEN040) at its data center located at 1160 N Gun Club Rd, Aurora, CO 80018 (DEN1, the facility) under Permit Number 22AR0210 Issuance 2 (Permit).

With this minor modification Construction Permit Application (application), QTS is proposing to expand their facility with the addition of two data centers (DC2 and DC3) under a separate, 24.9 tons per year nitrogen oxides (NO_x) limit. DC2 and DC3 will include a total of 98 EPA Tier 2 generators equipped with selective catalytic reduction (SCR) for NO_x emissions control. The proposed generator options for DC2 and DC3 are a Holt Caterpillar (CAT) generator set with engine model 3516C, rated at 2,500 kilowatt-electric (kWe) or a Yancey CAT generator set with engine model 3516C, rated at 2,500 kWe.

The Environmental Justice Letter of Concurrence was issued from the Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division to the facility on March 28, 2025, and is included in this application with the Environmental Justice Summary. A modeling demonstration was conducted in accordance with CDPHE's Colorado Minor New Source Review Source Modeling Guidelines for Air Quality Permits and is included with this application. A modeling determination is not included as a modeling demonstration is required.

QTS is not proposing any changes to the current emissions and fuel limits established for DC1. However, the following limits are being requested for DC2 and DC3:

- A combined uncontrolled operation fuel limit of 168,542 gallons per year (gal/yr); and

- A combined controlled operation fuel limit of 618,458 gal/yr.

For all permitted and proposed emergency generators at DC1, DC2, and DC3, QTS is requesting the following as required by the modeling demonstration:

- Operate between the hours of 7AM – 7PM only for non-emergency purposes;
- Only seven generators may operate at one time for non-emergency purposes; and
- Each generator may operate a maximum of 36 hours per year for non-emergency purposes.

All permitted emergency generators are EPA Tier 2 certified and the proposed emergency generators are EPA Tier 2 certified with SCR controls. Each emergency generator will be equipped with a 9,500-gallon diesel fuel storage tank. All associated diesel fuel storage tanks will be exempt from permitting in accordance with 5 CCR 1001-5 Part A Regulation No. 3 Section II.D.1.fff. No other emission units will be installed at the facility.

QTS has included the following documentation as part of this application package:

- Appendix A – Required Application Forms
- Appendix B – Process Flow Diagram, Plot Plan, and Site Map
- Appendix C – Detailed Emissions Calculations
- Appendix D – Engine Manufacturer Specifications and Emissions Data
- Appendix E – Environmental Justice Letter of Concurrence and Summary, and
- Appendix F – Modeling Review Report

If you or your staff require any additional information regarding this request, please contact Danny Kelly at (720) 814-8858 or Bennett Wildey of Environmental Resources Management (ERM) at (513) 830-9052. Thank you.

Sincerely,

Michael Grassmick

Digitally signed by Michael Grassmick
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Date: 2025.07.08 13:09:33-05'00'

Michael Grassmick
Vice President, Facilities Operations – QTS Federal

cc: Danny Kelly, QTS
Bennett Wildey, ERM

Attachments



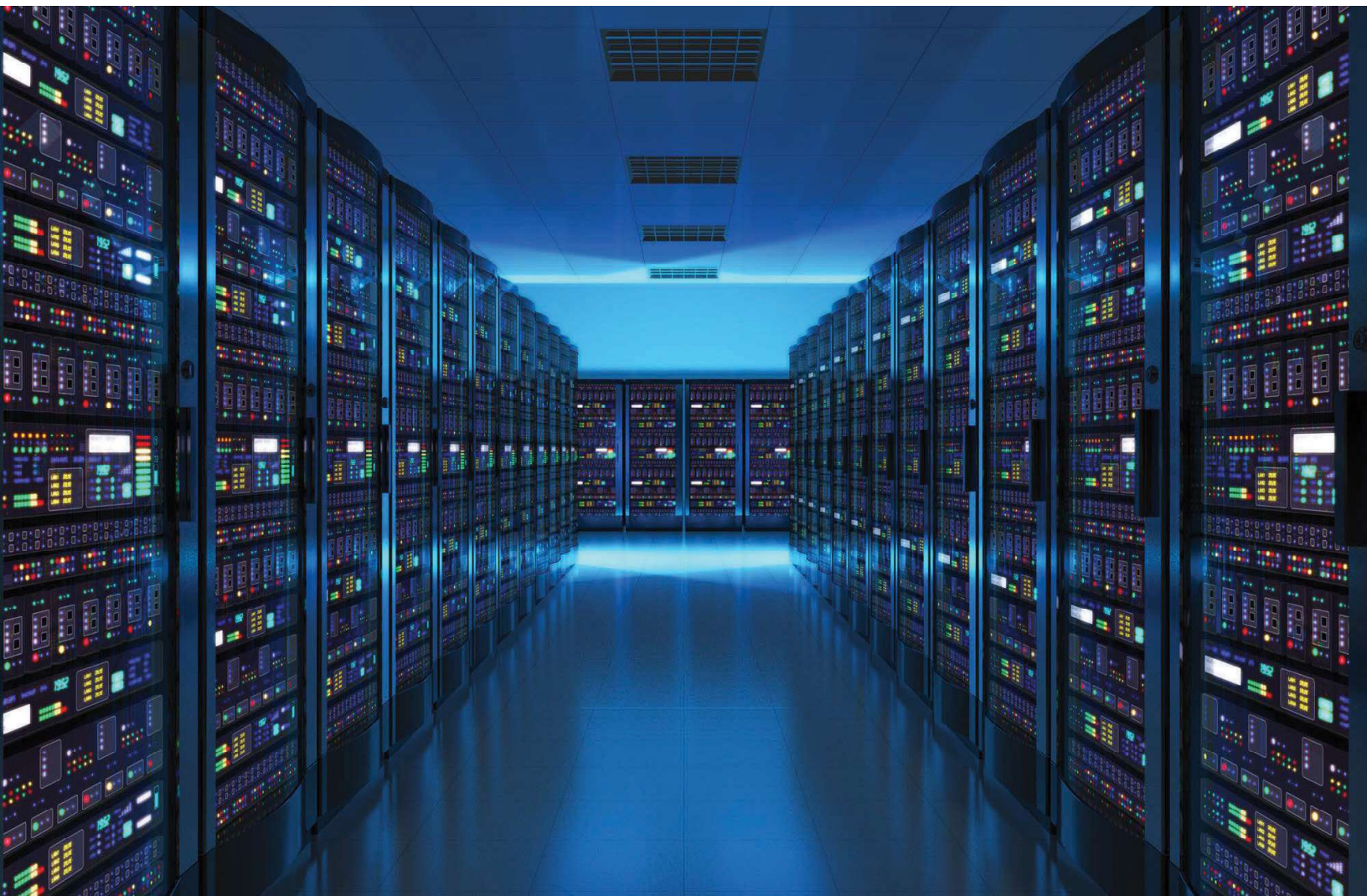
Synthetic Minor Modification Application

DEN1 DC2 and DC3 Expansion

PREPARED FOR
QTS Aurora, LLC

DATE
16 June 2025

REFERENCE
0606578



SIGNATURE PAGE

Synthetic Minor Modification Application

DEN1 DC2 and DC3 Expansion

0606578



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CLIENT: QTS Aurora, LLC
PROJECT NO: 0606578

DATE: 16 June 2025

VERSION: 02

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1. INTRODUCTION

QTS Aurora, LLC (QTS) is permitted to construct and operate 40 diesel-fired emergency generators (GEN001 – GEN040) at its data center located at 1160 N Gun Club Rd, Aurora, CO 80018 (DEN1, facility) under Permit Number 22AR0210 Issuance 2 (Permit). The facility is located in a severe nonattainment area for the 2008 ozone standard and serious nonattainment for the 2015 ozone standard. The facility is subject to reasonable available control technology (RACT) requirements under Regulation No. 3, Part B, III.D.2.b. QTS will adhere to requirements under current Permit Condition 13 as RACT per current Permit Condition 15.

The facility maintains business-critical information and other computer-related services on servers and similar equipment. All emergency generators will be used to provide backup power for site operations in case of utility failure or other related on-site power failure.

With this minor modification Construction Permit Application (application), QTS is proposing to expand their facility with the addition of two data centers (DC2 and DC3) under a separate, 24.9 tons per year (tpy) nitrogen oxides (NO_x) limit. DC2 and DC3 will include a total of 98 emergency generators equipped with selective catalytic reduction (SCR) for NO_x emissions control. The proposed generator options for DC2 and DC3 are a Holt Caterpillar (CAT) generator set with engine model 3516C, rated at 2,500 kilowatt-electric (kWe) or a Yancey CAT generator set with engine model 3516C, rated at 2,500 kWe.

The Environmental Justice (EJ) Letter of Concurrence was issued from the Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division (APCD) to the facility on March 28, 2025, and is included with the EJ Summary as Appendix E. A modeling demonstration was conducted in accordance with CDPHE's Colorado Minor New Source Review Source Modeling Guidelines for Air Quality Permits and is included with this application as Appendix F. A modeling determination is not included as a modeling demonstration is required.

2. PROJECT DESCRIPTION

With this application QTS is proposing to expand their facility with the addition of DC2 and DC3 with generator options of a Holt CAT generator set with engine model 3516C, rated at 2,500 kWe or a Yancey CAT generator set with engine model 3516C, rated at 2,500 kWe. All proposed generators at DC2 and DC3 will be equipped with Miratech SCR control devices.

By implementing a fuel limit for the proposed generators at DC2 and DC3 and equipping each one with SCR for NO_x emissions control, the project emissions increase is limited to 24.9 tpy NO_x. DEN1 is currently considered a synthetic minor source with respect to nonattainment new source review; therefore, this project is not subject to nonattainment new source review under 40 Code of Federal Regulation (CFR) 52.21 as the project emissions increase by itself does not constitute a nonattainment major source. QTS understands that any subsequent permit modifications would be subject to the nonattainment new source review modification thresholds under 40 CFR 52.21.



QTS proposes to include Holt CAT and Yancey CAT generator sets' fuel consumption rates in gallon-per-hour (gal/hr), and emission factors (EFs) for NO_x and carbon monoxide (CO) in pound-per-gallon (lb/gal) to the Permit, as summarized in Table 2-1 below. SCR untreated NO_x EFs and the CO EFs are provided by CAT, included in Appendix D. SCR treated NO_x EFs are provided by Miratech, included in Appendix D. The only difference between the Holt and Yancey CAT generator sets is the stack height above ground level, the fuel consumption and emission rates are the same.

TABLE 2-1 HOLT AND YANCEY CAT GENERATOR FUEL CONSUMPTION RATES AND EMISSION RATES

MTU Generator	25% Load	50% Load	75% Load	100% Load
Fuel Consumption Rate (gal/hr)	57.9	98.4	134.9	175.3
SCR untreated NO _x EF (lb/gal)	0.14	0.16	0.24	0.30
SCR treated NO _x EF (lb/gal)	0.04	0.01	0.01	0.01
CO EF (lb/gal)	0.06	0.02	0.02	0.04

QTS is not proposing any changes to DC1 permitted generators or their permitted emission and fuel consumption limits. Hours of operation at DC1 for non-emergency purposes are proposed to be increased from 24 hours per year per generator (hr/yr/gen) to 36 hr/yr/gen as described in Section 3. The facility will be considered a major source with respect to nonattainment new source review and Title V upon approval of this application. QTS will apply for a Title V operating permit within 12 months of starting operation of any emergency generator at DC2 or DC3.

As required by Regulation No. 3, Part B, III.B.5, QTS submitted the EJ Summary Report to the APCD EJ team in March 2025. The EJ Letter of Concurrence was issued to the facility on March 28, 2025 and is included with the EJ Summary as Appendix E.

Each permitted and proposed generator will be equipped with a diesel fuel storage tank with a maximum capacity of 9,500 gallons. All diesel fuel storage tanks will be exempt from Air Pollutant Emissions Notice (APEN) requirements per the Code of Colorado Regulations (CCR) 1001-5 Part A Regulation No. 3, Section II.D.1.fff. No other sources of regulated air pollutant emission sources will be installed at the facility.



All permitted and proposed generators are subject to New Source Performance Standards (NSPS) Subpart IIII. As required by NSPS Subpart IIII, the emergency generators are Tier 2 certified and will be operated to comply with the corresponding testing and maintenance operating limit of 100 hours per year per unit. The generators will each be equipped with a non-resettable hour meter to track compliance with this limit. Additionally, QTS will only use ultra-low sulfur diesel (ULSD) fuel to maintain compliance with the fuel sulfur content usage restrictions per NSPS Subpart IIII. Logs will be used to track operating load, hours of operation and fuel consumption for compliance with the 24.9 tpy NO_x limit for DC1 and the 24.9 tpy NO_x limit for DC2 and DC3, respectively. The generators will not be used for peak shaving or as part of an Emergency Demand Response Program as described in 40 CFR 60.4211(f)(2)¹. Per 40 CFR 60.4211(f)(3), the emergency generators will limit operation for non-emergency purposes unrelated to maintenance and testing to 50 hours per calendar year but will include these hours as part of the 100 hours per year limit for maintenance and testing. Detailed information regarding the emergency generators is included in Appendix D. Additional regulatory discussion for the facility is provided in Section 4.

3. MODELING SUMMARY

An air dispersion modeling report for this project is included as Appendix F to this application. Modeling was performed for the permitted and proposed emergency generators using the following assumptions:

- Air dispersion modeling is required for non-emergency operation only;
- Modeling is required to assess:
 - Short-term and annual impacts of nitrogen dioxide (NO₂) emissions;
 - Short-term impacts of sulfur dioxide (SO₂) emissions;
 - Short-term impacts of carbon monoxide (CO) emissions;
 - Short-term impacts of particulate matter less than 10 microns in diameter (PM₁₀) emissions; and
 - Short-term and annual impacts of particulate matter less than 2.5 microns in diameter (PM_{2.5}) emissions.
- Modeling included assessment of impact for 25%, 50%, 75%, and 100% load operations for each engine;
- Each permitted and proposed generator will only operate between the hours of 7AM - 7PM for non-emergency operation purposes;
- Only seven generators may operate at one time for non-emergency operation purposes at DEN1; and
- Each permitted and proposed generator at DEN1 will operate a maximum of 36 hr/yr/gen for non-emergency purposes.

As summarized in the modeling report, predicted air quality impacts from NO₂, CO, PM₁₀, PM_{2.5}, and SO₂ emissions demonstrate compliance for all permitted and proposed emergency generators with National Ambient Air Quality Standards (NAAQS).

¹ Per a D.C. Circuit Court Mandate made on May 4, 2016, subsections 60.4211(f)(2)(ii)-(iii) were vacated



4. ANNUAL FUEL LIMITATIONS

QTS is requesting two combined annual fuel limits to be established to demonstrate compliance with the 24.9 tpy emissions limit, one for controlled operation and one for uncontrolled operation. The controlled operation fuel limit of 618,458 gallons per year (gal/yr) demonstrates how much fuel all generators at DC2 and DC3 can burn under the 36 annual hours of operation limit per generator required by the modeling demonstration, assuming controlled operation. The uncontrolled operation fuel limit of 168,542 gal/yr demonstrates how much fuel all generators can burn under the emissions limit of 24.9 tpy NO_x, assuming uncontrolled operation.

Compliance with the two annual fuel limits will be demonstrated through the following formula:

$$\frac{\text{Controlled Operation Fuel Usage}}{\text{Controlled Operation Fuel Limit}} + \frac{\text{Uncontrolled Operation Fuel Usage}}{\text{Uncontrolled Operation Fuel Limit}} \leq 1$$

By maintaining this formula, QTS will be compliant with both the annual emissions and annual operating hours limitations.

The previously established emissions limit of 24.9 tpy NO_x for DC1 and the 128,484 gal/yr combined fuel consumption limit are not being revised with this application.

5. EMISSION SUMMARY

This section presents a discussion of the anticipated emissions at DEN1, including DC1, DC2 and DC3. The facility's potential to emit (PTE) has been estimated for the following regulated air pollutants: NO_x, CO, volatile organic compound (VOC), SO₂, filterable particulate matter (PM), PM₁₀, PM_{2.5}, and hazardous air pollutants (HAPs). Detailed calculations are included in Appendix C.

QTS proposes to continue using the manufacturer-supplied emission factors corresponding to each load percentage (i.e., 25%, 50%, 75%, 100%) as well as fuel consumed to determine monthly and 12-month rolling total actual criteria pollutant emissions. As required by Permit Note No. 3 to Permit Holder, QTS will round the fuel consumption rate up to the next highest load percentage increment, and round emission factors up or down to the higher value of the two load percentage increments.

Table 5-1 below presents the emission factors of the proposed Yancey and Holt CAT generators for use when accounting for actual operating load at DC2 and DC3. For VOC, NO_x, CO and PM, EFs are derived from manufacturer specification sheets (Appendix D). SCR treated NO_x EFs at DC2 and DC3 are provided by Miratech (Appendix D). Emission factors for all other pollutants are derived from fuel consumption rates from manufacturer specification sheets (Appendix D) and AP-42 Chapter 3, Section 3.4, *Large Stationary Diesel and All Stationary Dual-fuel Engines* dated 10/96. Detailed emission factors and emissions calculations can be found in Appendix C.



TABLE 5-1 YANCEY AND HOLT CAT GENERATOR EMISSION FACTOR SUMMARY

Pollutant	Emission Factor (lb/gal)			
	25% Load	50% Load	75% Load	100% Load
VOC	0.02	0.01	0.01	0.01
SCR untreated NO _x	0.14	0.16	0.24	0.30
SCR treated NO _x	0.04	0.01	0.01	0.01
CO	0.06	0.02	0.02	0.04
PM	0.01	0.003	0.002	0.002
PM ₁₀	0.005	0.003	0.002	0.002
PM _{2.5}	0.004	0.002	0.001	0.002
SO ₂	0.0002	0.0002	0.0002	0.0003
Combined HAP	0.0002	0.0002	0.0002	0.0002

Table 5-2 below summarizes the PTE for the 98 proposed generators at DC2 and DC3, the 40 permitted generators at DC1, and the DEN1 facility-wide PTE after the proposed modification. The PTE for DC1 remains unchanged with an annual combined fuel limit of 128,484 gal/yr with the highest emission factors for all operating loads. The NO_x PTE for DC2 and DC3 assumes an annual combined uncontrolled fuel limit of 168,542 gal/yr with the highest uncontrolled NO_x emission factor from all operating loads. For the remaining pollutants, PTE for DC2 and DC3 assumes an annual combined controlled fuel limit of 618,458 gal/yr with the highest emission factors from all operating loads. The facility-wide PTE is the summation of PTE for DC1 through DC3. Note that VOC emissions from diesel storage tanks are included in the projected actual emissions and PTE listed below. Detailed emissions calculations for all pollutants are included in Appendix C of this application. The emission estimation for the diesel storage tanks is included in Appendix C.



TABLE 5-2 EMISSIONS SUMMARY

Pollutant	DC1 PTE Emissions	DC2 and DC3 PTE Emissions	DEN1 Facility-Wide PTE
	tpy	tpy	tpy
VOC	3.28	5.08	8.37
NO _x	24.90	24.90	49.80
CO	12.05	18.07	30.12
PM	0.79	1.72	2.50
PM ₁₀	0.65	1.41	2.06
PM _{2.5}	0.63	1.37	2.00
SO ₂	0.02	0.08	0.09
Combined HAP	0.01	0.06	0.08

6. REGULATORY APPLICABILITY

The data center is located in Denver, Colorado, in Arapahoe County, a severe nonattainment area for the 2008 ozone standard and serious nonattainment area for the 2015 ozone standard. The following regulatory analysis identifies potentially applicable state and federal air quality regulations and explains why each regulation is or is not considered applicable to the proposed project.

6.1 FEDERAL REGULATIONS

6.1.1 NEW SOURCE PERFORMANCE STANDARDS

NSPS require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. The NSPS regulations may be found in 40 CFR 60. An analysis of potentially applicable NSPS subparts is presented below.

6.1.1.1 SUBPART A – GENERAL PROVISIONS

Facilities subject to source specific NSPS are also subject to the general provisions of NSPS Subpart A (40 CFR 60). Because the facility is subject to another 40 CFR 60 subpart, as discussed in Section 4.1.1.2, the provisions of Subpart A are applicable. NSPS Subpart A may require the following of facilities subject to a source specific NSPS:



- Initial construction/reconstruction notifications
- Initial startup notifications
- Performance tests
- Performance test date initial notifications
- General monitoring requirements
- General recordkeeping requirements
- Semiannual monitoring system and/or excess emissions reports.

The facility will comply with the provisions of NSPS Subpart A, as applicable.

6.1.1.2 SUBPART IIII – NSPS FOR STATIONARY COMPRESSION IGNITION INTERNAL COMBUSTION ENGINES

NSPS Subpart IIII establishes emission standards and compliance requirements for the control of emissions from stationary compression ignition (CI) internal combustion engines (ICE) which are constructed, reconstructed, or modified after July 11, 2005.

With this revised application, QTS proposes to expand their facility with an additional 98 CI ICEs at DC2 and DC3 to the currently permitted 40 CI ICEs at DC1. Thus, QTS will operate a total of 138 CI ICEs at DEN1 that were constructed after July 2005. Therefore, the facility contains applicable units and is required to comply with the provisions of this subpart.

Because the applicable units are identified as emergency equipment, each engine will be equipped with a non-resettable hour meter and will not operate for greater than 100 hours per year for maintenance and testing purposes. The engines will comply with the United State Environmental Protection Agency (EPA) Tier 2 emission standards, and the engines will comply with the fuel requirements of this subpart by using only 15 ppm or lower sulfur diesel fuel.

6.1.2 NATIONAL STANDARDS FOR HAZARDOUS AIR POLLUTANTS

National Emission Standards for Hazardous Air Pollutants (NESHAP) are emission standards for HAPs that are generally applicable to major sources of HAPs, but also apply to certain area sources of HAPs. A HAP major source is defined as having potential emissions equal to and in excess of 10 tons per year for any individual HAP and/or 25 tons per year for total HAPs. NESHAP apply to specific pollutant sources (40 CFR 61), or to sources in specifically regulated industrial source categories (CAA Section 112(d)), or on a case-by-case basis (Section 112(g) or 112(j)) for facilities not regulated as a specific industrial source type (40 CFR 63). The facility will be an area source for HAPs. An applicability analysis of potentially applicable NESHAP (Part 63) subparts is presented below.

6.1.2.1 SUBPART A – GENERAL PROVISIONS

All affected sources are subject to the general provisions of NESHAP Subpart A unless specifically excluded by the source specific NESHAP. NESHAP Subpart A requires initial notification,



performance testing, recordkeeping, and monitoring, provides reference methods, and mandates general control device requirements for all other subparts as applicable.

6.1.2.2 SUBPART ZZZZ – NESHAP FOR STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES

NESHAP (40 CFR 63) Subpart ZZZZ provides HAP emission limitations and operating limitations for stationary reciprocating internal combustion engines (RICE), including emergency engines, located at facilities that are major or area sources of HAP emissions.

With this revised application, QTS proposes to permit an additional 98 CI ICEs at DC2 and DC3 to the 40 currently permitted CI ICEs at DC1. Thus, QTS will operate a total of 138 CI ICE facility-wide at DEN1. With the current combined fuel consumption limit established under Permit Condition 10, DC1 has the potential to emit approximately 0.01 tons of total HAP per year. Based on the proposed combined fuel consumption limit, DC2 and DC3 have the potential to emit approximately 0.13 tons of total HAP per year. Facility-wide HAP emissions are estimated to be 0.14 tons of total HAP per year, as shown in the emissions calculations included in Appendix C. Thus, the proposed HAP emissions are below the Major Source threshold of 25 tpy combined HAP or 10 tpy for any single HAP, and the facility will remain an area source of HAPs.

Per 40 CFR 63.6590(c)(1), QTS will comply with the NSPS provisions in 40 CFR 60, Subpart IIII for the permitted and proposed generator engines. Consequently, no further provisions under NESHAP Subpart ZZZZ will apply to these engines.

6.2 COLORADO STATE REGULATIONS

The following regulatory review identifies potentially applicable state air quality regulations and explains why each regulation is or is not considered applicable to the facility.

6.2.1 5 CCR 1001-5 REGULATION NO. 3, PART A – CONCERNING GENERAL PROVISIONS APPLICABLE TO REPORTING AND PERMITTING

Under CCR 1001-5 Part A of Regulation No. 3, a stationary source is required to submit an APEN for each individual emission point in a nonattainment area with uncontrolled actual emissions of one tpy or more of any individual criteria pollutant. For non-criteria reportable pollutants, an APEN is required for each individual emission point with uncontrolled actual emissions equal to or greater than 250 pounds (lbs.) per year or more of any individual non-criteria reportable pollutant.

DC1 will consist of 40 diesel-fired emergency generators rated at 2,500 kWe each. DC2 and DC3 will consist of 98 diesel-fired emergency generators rated at 2,500 kWe each. Each generator will have uncontrolled emissions of greater than one tpy of NO_x and will not emit more than 250 lbs. of any non-criteria reportable pollutants. Therefore, the facility is submitting this APEN specific to compression ignition engines.

Each engine will also have an associated belly tank for diesel fuel storage with a maximum annual throughput of 87,650 gal/yr, based on maximum operation of 500 hours per year per generator



using the higher 100% load fuel consumption rate from the CAT generator model for both emergency and non-emergency purposes. Pursuant Section II.D.1.fff of this regulation, storage tanks whose annual throughput is less than 400,000 gallons of certain liquids including diesel fuel are exempt from APEN requirements. Thus, these tanks will be exempt.

6.2.2 5 CCR 1001-5 REGULATION NO. 3, PART B – CONCERNING CONSTRUCTION PERMITS

Under CCR 1001-5 Part B of Regulation No. 3, no person shall commence construction of any stationary source or modification of a stationary source without first obtaining or having a valid construction permit from the Division. Additionally, the CDPHE defines the emission threshold quantities that establish RACT applicability under this regulation.

QTS is submitting this application for the construction of DC2 and DC3 with two generator make and model options proposed. The facility is located in an ozone nonattainment area and is subject to the RACT requirements under Regulation No. 3, Part B, III.D.2.b. QTS will adhere to requirements under current Permit Condition 13 as the RACT per current Permit Condition 15.

Per Regulation No. 3, Part B, III.B.5, beginning July 15, 2023, all applications must include an EJ summary for each census block group in which the source is located as part of the permit application. The EJ Letter of Concurrence was issued to the facility on March 28, 2025 and is included with the EJ Summary as Appendix E.

6.2.3 5 CCR 1001-5 REGULATION NO. 3, PART C – CONCERNING OPERATING PERMITS

The provisions of this Regulation Number 3, Part C shall apply statewide to all sources of air pollutants that are required to obtain an operating permit as specified in Section II of this part.

The facility-wide PTE at DEN1 will not exceed 50 tpy for any criteria pollutants. DEN1 will be considered a major source with respect to nonattainment new source review and Title V upon approval of this application. QTS will apply for a Title V operating permit within 12 months of starting operation of any emergency generator at DC2 or DC3. Additionally, the associated diesel storage tanks are exempt pursuant to Part C Section II.E.3.fff. The facility will maintain monthly records of operating hours and emissions on site for annual reporting requirements.

6.2.4 5 CCR 1001-8 REGULATION NO. 6 – STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

Certain regulations promulgated by the EPA found in 40 CFR 60 are adopted by the Colorado Air Quality Control Commission and are hereby incorporated by reference.

Applicability to adopted regulations in CCR 1001-8 Regulation No. 6 are included as part of the Federal Regulatory Applicability in Section 4.1 above.



6.2.5 5 CCR 1001-9 REGULATION NO. 7, PART B – STORAGE, TRANSFER, AND DISPOSAL OF VOLATILE ORGANIC COMPOUNDS AND PETROLEUM LIQUIDS AND PETROLEUM PROCESSING AND REFINING

The provisions of this regulation apply to any ozone nonattainment area, which includes areas designated nonattainment for either the 1-hour or 8-hour ozone standard. The provisions set operational and control requirements for applicable sources.

Pursuant Section IV.B.1(a), the proposed diesel storage tanks are exempt from regulation as they only store Fuel Oil #2. Additionally, the diesel-fired emergency engines are not considered affected sources. Therefore, DEN1 is not subject to regulation under this rule.

6.2.6 5 CCR 1001-10 REGULATION NO. 8 – CONTROL OF HAZARDOUS AIR POLLUTANTS

Certain provisions promulgated by the EPA found in 40 CFR 61 are adopted by the Colorado Air Quality Control Commission and are hereby incorporated by reference in this regulation.

No adopted regulations adopted by the Colorado Air Quality Control Commission are applicable to the diesel-fired emergency engines or associated fuel tanks included in this application. Any applicable federal provisions are included in Section 4.1 above.





APPENDIX A REQUIRED APPLICATION FORMS



COLORADO
Air Pollution Control Division
Department of Public Health & Environment

Permit Application/Registration Checklist Form APCD-100

- A complete permit application must include the documentation outlined in this form unless otherwise noted.
- If the permit application does not include the required documentation, **it may be rejected**.
- Filing fees for permit applications that are rejected due to incompleteness **will not be refunded**.
- Certain types of emission sources may require additional forms. Refer to the Division's [APENs and air permits webpage](#) to see whether any APEN supplement forms are required for your source.
- If the application is for a major NANSR or PSD permit, send eight (8) total copies.

Company Name: QTS Aurora, LLC

Facility/Site Name(s): QTS DEN1

What type of permit coverage is requested by this application?

- ☒ Traditional construction permit
☐ General permit (e.g. GP01, GP03, etc.)

Are you requesting (an) individual or facility-wide permit(s)?

- ☐ Individual permit(s) covering (a) single emissions point(s).
☒ Facility-wide permit covering multiple emissions points.

Check one box in each section of the following table to certify that the referenced documentation is included with the permit application. Do not check more than one box per section unless otherwise noted.

Section	Description of Required Permit Application Element
A	☒ The relevant filing fee(s) are being submitted with this application, or were already submitted.
B	☒ This application contains the relevant Air Pollutant Emission Notice(s). (APCD Form Series 200)
C	☒ This application contains relevant emission calculations and supporting documentation.
D	☒ This application contains company contact information documentation. (Form APCD-101)
	☐ There is only a single point of contact for this application. (Form APCD-101 is not required.)

(Checklist continued on next page)

Required Permit Application Element Checklist (continued):

E	<u>Environmental Justice Documentation</u> ☒ A complete Environmental Justice (EJ) Summary for this project was submitted prior to this application, and was reviewed and verified by the Division. The verification number for this EJ Summary is <u>85952293</u>. ☐ This application is exempt from EJ Summary requirements for the following reason(s), per Colorado Regulation Number 3, Part B, Section III.B.5.e. (check all that apply): ☐ This application is only for an administrative permit amendment. (Section III.B.5.e.(i)) ☐ This application requests an overall decrease or no change in the facility-wide annual emission limits of NO_x, VOC, PM_{2.5}, and BTEX pollutants. (Section III.B.5.e.(ii)) ☐ This application is for a modification at an existing source of emissions, and an up-to-date EJ Summary was already verified by the Division on _____. (Section III.B.5.e.(iii))
F	<u>Ambient Air Impact Analysis Documentation</u> ☐ This application is exempt from modeling determination requirements for the following reason(s), per the document Permitting Section Addendum to the Modeling Guideline (2/21/2024) (check all that apply): ☐ “No Emission Increases or ‘Pure Decreases’ in a Permit Modification” (Section 2.1) ☐ “Only VOC Increases” (Section 2.2) ☐ “APEN-exempt and Permit-exempt Emission Sources” (Section 2.3) ☐ “Land Development Projects Requesting Coverage Under a General Permit (GP03)” (Section 2.4) ☐ A request for modeling determination for the project(s) included in this application has been submitted, and the Division determined that additional modeling was not required. This application contains the version of the modeling determination request that was <u>reviewed and approved by the Division</u>. (Form APCD-114) ☒ This application is for a traditional construction permit, and a modeling analysis for the project(s) included in this application has been submitted, but not yet approved by the Division. ☐ A modeling analysis for the project(s) included in this application has been approved by the Division. This application contains any relevant documentation of this approval, including the submitted modeling analysis and the Division’s modeling review comments which document compliance with the NAAQS and the conditions of approval for the proposed project(s). ☐ This application is for a traditional construction permit, and a NAAQS monitoring plan is being submitted with this application, or has already been submitted. If this monitoring plan has already been reviewed and approved by the Division, this application contains the plan itself and documentation of plan approval.

(Checklist continued on next page)

Required Permit Application Element Checklist (continued):

G	<u>General Permit Monitoring Compliance Documentation</u>	
	☒ This application is: A) requesting coverage under a traditional construction permit, and/or B) the emission source(s) contained in this application are not located in a Disproportionately Impacted (DI) Community.	
	(For the following three options) This application is requesting coverage under a general permit, the emission source(s) contained in this application are located in a Disproportionately Impacted (DI) Community, and:	
	☐ This source will comply with source-specific monitoring requirements as outlined in Regulation Number 3, Part B, Section III.J.2.	
	☐ This source will pay community monitoring fees as outlined in Regulation Number 3, Part B, Section III.J.3.	
☐ This source will comply with well production facility monitoring requirements as outlined in Regulation Number 3, Part B, Section III.J.4.		
☐ This source is not subject to Regulation Number 3, Part B, Sections III.J.2., III.J.3, or III.J.4.		
H	☒ This application contains a facility-wide emissions inventory. (Form APCD-102 for oil & gas sources, or form APCD-102a for non-oil & gas sources)	
I	☒ This application contains a process description, flow diagram, and plot plan of the emissions unit and/or facility, as relevant.	
J	☐ This application contains the relevant Operating & Maintenance (O&M) Plan documentation. (APCD Form Series 300)	
	☒ This application is: A) for a true minor source of emissions, and/or B) for an emissions source that is not associated with the oil & gas industry, and/or C) requesting coverage under a general permit. (APCD Form Series 300 is not required.)	

Applicant Certification:

I hereby certify that all information contained herein and information submitted with this application is complete, true, and correct.

Michael Grassmick

Digitally signed by Michael Grassmick
 DN: C=US, E=michael.grassmick@qtsdatacenters.com,
 O=QTS Federal LLC, CN=Michael Grassmick
 Date: 2025.07.08 13:10:32-05'00'

7/8/2025

Signature of Legally Authorized Person (not a vendor or consultant)

Date

Michael Grassmick

Vice President, Facilities Operations - QTS Federal

Name (print)

Title

Send the application with all required information/documentation (including this form) and any applicable fees to:

CDPHE - Air Pollution Control Division
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Form APCD-101Colorado Department of Public Health and Environment
Air Pollution Control DivisionColorado Department
of Public Health
and Environment**Company Contact Information Form**

Ver. September 10, 2008

Company Name: QTS Aurora, LLC**Source Name:** QTS DEN1

Permit Contact¹:	Christopher Puhek		
Address:	1160 N Gun Club Rd		
	Street		
	Aurora	CO	80018
	City	State	Zip
Phone Number:	(720) 425-4416		
Fax Number:			
E-mail:	christopher.puhek@qtsdatacenters.com		

Compliance Contact²:	Christopher Puhek		
Address:	1160 N Gun Club Rd		
	Street		
	Aurora	CO	80018
	City	State	Zip
Phone Number:	(720) 425-4416		
Fax Number:			
E-mail:	christopher.puhek@qtsdatacenters.com		

Billing Contact: (Permit Fees)³	Preston Humphreys		
Address:	1160 N Gun Club Rd		
	Street		
	Aurora	CO	80018
	City	State	Zip
Phone Number:	(936) 661-9054		
Fax Number:			
E-mail:	preston.humphreys@qtsdatacenters.com		

Billing Contact: (Annual Fees)⁴	Christopher Puhek		
Address:	1160 N Gun Club Rd		
	Street		
	Aurora	CO	80018
	City	State	Zip
Phone Number:	(720) 425-4416		
Fax Number:			
E-mail:	christopher.puhek@qtsdatacenters.com		

Check how would you like to receive your permit fee invoice?

Mail: ☒E-mail: ☒Fax: ☐Footnotes:¹ The permit contact should be the point of contact for technical information contained in the permit application. This may be a company representative or a consultant.² The compliance contact should be the point of contact for discussing inspection and compliance at the permitted facility.³ The billing contact (Permit fees) should be the point of contact that should receive the invoice for fees associated with processing the permit application & issuing the permit. (Reg. 3, Part A, Section VI.B)⁴ The billing contact (Annual fees) should be the point of contact that should receive the invoices issued on an annual basis for fees associated with actual emissions reported on APENs for the facility. (Reg. 3, Part A, Section VI.C)



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

New Source Performance Standards (NSPS) – 40 CFR Part 60, Subpart IIII Applicability Air Pollutant Emission Notice (APEN) Addendum Form for Diesel Engines

Company Name: QTS Aurora, LLC

Engine Information¹

Make: Kohler Model: KD2500 SN: TBD

1. Date of Engine Manufacture: TBD
2. Has this engine operated outside of the state of Colorado?

☐ Yes
☒ No
3. If you answered "Yes" to question 2, please answer the following question. (If you answered "No" to question 2, please leave this field blank.) What is the date of first entry into Colorado? _____
4. This engine was manufactured to meet the following tier level standards² (e.g., Tier 1, Tier 2): Tier 2

Permit #³: 22AR0210 AIRS ID³: 005 / 1777

A copy of this form, along with appropriate supporting documentation⁴, shall be maintained on-site or at a local field office, with stationary source responsibility, with a copy of the construction permit, exemption letter or general permit approval letter issued by the Colorado Air Pollution Control Division (the Division) for this emissions source. These records may be kept in either electronic or hard copy format provided that they can be promptly supplied to the Division or agents thereof upon request.

This engine shall comply with the New Source Performance Standards (NSPS) requirements of Colorado Air Quality Control Commission Regulation No. 6, Part A, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE) including, but not limited to, the following:

[The requirements below reflect the rule language of 40 CFR Part 60 Subpart IIII published in the Federal Register on 01/30/2013. However, if revisions to this Subpart are published at a later date, the owner or operator is subject to the requirements contained in the revised version of 40 CFR Part 60, Subpart IIII.]

- I. All fuel used shall meet the following specifications:
 - A. Sulfur content shall not exceed 15 ppm
 - B. Have a minimum cetane index of 40 or have a maximum aromatic compound content of 35% by volume
 - C. Compliance shall be demonstrated by maintaining copies of the fuel specifications provided by the supplier on-site or in a readily accessible location and made available to the Division for inspection upon request.
- II. The engine and control devices must be installed, configured, operated and maintained according to the specifications and instructions provided by the engine manufacturer.
- III. If the engine is equipped with a diesel particulate filter, the filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. Records shall be kept of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit is approached.
- IV. If the engine is used for emergency purposes, a non-resettable hour meter must be installed prior to start-up.
- V. If the diesel fuel-fired engine referenced herein avoids tier 4 or 4i requirements by being an emergency generator, the engine shall not be used for any purpose except emergency power generation and for the purpose of maintenance



checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited.

VI. Emission Standards:

- A. The engine referenced herein shall meet all the emissions standards applicable to the engine.
 B. Compliance with the NSPS Subpart IIII Emissions Standards for Non-Methane Hydrocarbons (NMHC), Nitrogen Oxides (NOx), Carbon Monoxide (CO) and Particulate Matter (PM) shall be demonstrated by filing a copy of the unit's certification documentation of compliance with the NSPS Subpart IIII emissions standards, with the associated application.

VII. The following requirements of Regulation No. 6, Part A, Subpart A, General Provisions, shall apply:

- A. At all times, including periods of start-up, shutdown, and malfunction, the engine and control equipment shall, to the extent practicable, be maintained and operated in a manner consistent with good air pollution control practices for minimizing emissions. Determination of whether or not acceptable operating and maintenance procedures are being used will be based on information available to the Division, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. (Reference: Regulation No. 6, Part A, General Provisions from 40 CFR 60.11)
 B. No article, machine, equipment or process shall be used to conceal an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere. (§ 60.12)
 C. Written notification of construction and initial startup dates shall be submitted to the Division as required under § 60.7.
 D. Records of startups, shutdowns, and malfunctions shall be maintained, as required under § 60.7.

VIII. This engine meets all the requirements in New Source Performance Standard (NSPS) Subpart IIII as applicable to the specific engine, including the standards required for relocating into Colorado as set forth in Regulation No. 6, Part B, Section I.C.

I hereby certify that all information contained herein is complete, true and correct. I certify that this source is and will be operated in full compliance with the applicable tier standards of Colorado Air Quality Control Commission Regulation No. 6, Part A, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE) as well as all other requirements referenced herein.

Michael Grassmick

Vice President, Facilities Operations - QTS Federal

Name of Legally Authorized Person (Please Print)

Title

Michael Grassmick

Digitally signed by Michael Grassmick
 DN: C=US, E=michael.grassmick@qtsdatacenters.com,
 O=QTS Federal LLC, CN=Michael Grassmick
 Date: 2025.07.08 13:15:33-0500

7-8-2025

Signature of Legally Authorized Person

Date

¹ If the engine has not been selected or ordered as of the date of submission of the construction permit application, this form must be completed and submitted to the Colorado Air Pollution Control Division, for an affected engine, within one hundred and eighty (180) days after the commencement of construction/operation.

² This information can be obtained from the engine manufacturer.

³ Please enter this information if this form is being submitted after the date of submission of the construction permit application and a permit number and AIRS ID number have been assigned. Otherwise, leave these fields blank.

⁴ Supporting documentation includes: document(s) proving the date of first entry into Colorado (purchase receipt, delivery receipt, etc.) and tier standard certification information from the manufacturer, as applicable.



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

New Source Performance Standards (NSPS) – 40 CFR Part 60, Subpart IIII Applicability Air Pollutant Emission Notice (APEN) Addendum Form for Diesel Engines

Company Name: QTS Aurora, LLC

Engine Information¹

Make: MTU Model: 20V4000G64S SN: TBD

1. Date of Engine Manufacture: TBD
2. Has this engine operated outside of the state of Colorado?

☐ Yes
☒ No
3. If you answered "Yes" to question 2, please answer the following question. (If you answered "No" to question 2, please leave this field blank.) What is the date of first entry into Colorado? _____
4. This engine was manufactured to meet the following tier level standards² (e.g., Tier 1, Tier 2): Tier 2

Permit #³: 22AR0210 AIRS ID³: 005 / 1777

A copy of this form, along with appropriate supporting documentation⁴, shall be maintained on-site or at a local field office, with stationary source responsibility, with a copy of the construction permit, exemption letter or general permit approval letter issued by the Colorado Air Pollution Control Division (the Division) for this emissions source. These records may be kept in either electronic or hard copy format provided that they can be promptly supplied to the Division or agents thereof upon request.

This engine shall comply with the New Source Performance Standards (NSPS) requirements of Colorado Air Quality Control Commission Regulation No. 6, Part A, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE) including, but not limited to, the following:

[The requirements below reflect the rule language of 40 CFR Part 60 Subpart IIII published in the Federal Register on 01/30/2013. However, if revisions to this Subpart are published at a later date, the owner or operator is subject to the requirements contained in the revised version of 40 CFR Part 60, Subpart IIII.]

- I. All fuel used shall meet the following specifications:
 - A. Sulfur content shall not exceed 15 ppm
 - B. Have a minimum cetane index of 40 or have a maximum aromatic compound content of 35% by volume
 - C. Compliance shall be demonstrated by maintaining copies of the fuel specifications provided by the supplier on-site or in a readily accessible location and made available to the Division for inspection upon request.
- II. The engine and control devices must be installed, configured, operated and maintained according to the specifications and instructions provided by the engine manufacturer.
- III. If the engine is equipped with a diesel particulate filter, the filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. Records shall be kept of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit is approached.
- IV. If the engine is used for emergency purposes, a non-resettable hour meter must be installed prior to start-up.
- V. If the diesel fuel-fired engine referenced herein avoids tier 4 or 4i requirements by being an emergency generator, the engine shall not be used for any purpose except emergency power generation and for the purpose of maintenance



checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited.

VI. Emission Standards:

- A. The engine referenced herein shall meet all the emissions standards applicable to the engine.
 B. Compliance with the NSPS Subpart IIII Emissions Standards for Non-Methane Hydrocarbons (NMHC), Nitrogen Oxides (NOx), Carbon Monoxide (CO) and Particulate Matter (PM) shall be demonstrated by filing a copy of the unit's certification documentation of compliance with the NSPS Subpart IIII emissions standards, with the associated application.

VII. The following requirements of Regulation No. 6, Part A, Subpart A, General Provisions, shall apply:

- A. At all times, including periods of start-up, shutdown, and malfunction, the engine and control equipment shall, to the extent practicable, be maintained and operated in a manner consistent with good air pollution control practices for minimizing emissions. Determination of whether or not acceptable operating and maintenance procedures are being used will be based on information available to the Division, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. (Reference: Regulation No. 6, Part A, General Provisions from 40 CFR 60.11)
 B. No article, machine, equipment or process shall be used to conceal an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere. (§ 60.12)
 C. Written notification of construction and initial startup dates shall be submitted to the Division as required under § 60.7.
 D. Records of startups, shutdowns, and malfunctions shall be maintained, as required under § 60.7.

VIII. This engine meets all the requirements in New Source Performance Standard (NSPS) Subpart IIII as applicable to the specific engine, including the standards required for relocating into Colorado as set forth in Regulation No. 6, Part B, Section I.C.

I hereby certify that all information contained herein is complete, true and correct. I certify that this source is and will be operated in full compliance with the applicable tier standards of Colorado Air Quality Control Commission Regulation No. 6, Part A, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE) as well as all other requirements referenced herein.

Michael Grassmick

Vice President, Facilities Operations - QTS Federal

Name of Legally Authorized Person (Please Print)

Title

Michael Grassmick

Digitally signed by Michael Grassmick
 DN: C=US,
 E=michael.grassmick@qtsdatacenters.com, O=QTS
 Federal LLC, CN=Michael Grassmick
 Date: 2025.07.08 13:16:08-05'00'

7-8-2025

Signature of Legally Authorized Person

Date

¹ If the engine has not been selected or ordered as of the date of submission of the construction permit application, this form must be completed and submitted to the Colorado Air Pollution Control Division, for an affected engine, within one hundred and eighty (180) days after the commencement of construction/operation.

² This information can be obtained from the engine manufacturer.

³ Please enter this information if this form is being submitted after the date of submission of the construction permit application and a permit number and AIRS ID number have been assigned. Otherwise, leave these fields blank.

⁴ Supporting documentation includes: document(s) proving the date of first entry into Colorado (purchase receipt, delivery receipt, etc.) and tier standard certification information from the manufacturer, as applicable.



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

New Source Performance Standards (NSPS) – 40 CFR Part 60, Subpart IIII Applicability Air Pollutant Emission Notice (APEN) Addendum Form for Diesel Engines

Company Name: QTS Aurora, LLC

Engine Information¹

Make: Caterpillar Model: 3516C SN: TBD

1. Date of Engine Manufacture: TBD
2. Has this engine operated outside of the state of Colorado?

☐ Yes
☒ No
3. If you answered "Yes" to question 2, please answer the following question. (If you answered "No" to question 2, please leave this field blank.) What is the date of first entry into Colorado? _____
4. This engine was manufactured to meet the following tier level standards² (e.g., Tier 1, Tier 2): Tier 2

Permit #³: 22AR0210 AIRS ID³: 005 / 1777

A copy of this form, along with appropriate supporting documentation⁴, shall be maintained on-site or at a local field office, with stationary source responsibility, with a copy of the construction permit, exemption letter or general permit approval letter issued by the Colorado Air Pollution Control Division (the Division) for this emissions source. These records may be kept in either electronic or hard copy format provided that they can be promptly supplied to the Division or agents thereof upon request.

This engine shall comply with the New Source Performance Standards (NSPS) requirements of Colorado Air Quality Control Commission Regulation No. 6, Part A, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE) including, but not limited to, the following:

[The requirements below reflect the rule language of 40 CFR Part 60 Subpart IIII published in the Federal Register on 01/30/2013. However, if revisions to this Subpart are published at a later date, the owner or operator is subject to the requirements contained in the revised version of 40 CFR Part 60, Subpart IIII.]

- I. All fuel used shall meet the following specifications:
 - A. Sulfur content shall not exceed 15 ppm
 - B. Have a minimum cetane index of 40 or have a maximum aromatic compound content of 35% by volume
 - C. Compliance shall be demonstrated by maintaining copies of the fuel specifications provided by the supplier on-site or in a readily accessible location and made available to the Division for inspection upon request.
- II. The engine and control devices must be installed, configured, operated and maintained according to the specifications and instructions provided by the engine manufacturer.
- III. If the engine is equipped with a diesel particulate filter, the filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. Records shall be kept of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit is approached.
- IV. If the engine is used for emergency purposes, a non-resettable hour meter must be installed prior to start-up.
- V. If the diesel fuel-fired engine referenced herein avoids tier 4 or 4i requirements by being an emergency generator, the engine shall not be used for any purpose except emergency power generation and for the purpose of maintenance



checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited.

VI. Emission Standards:

- A. The engine referenced herein shall meet all the emissions standards applicable to the engine.
 B. Compliance with the NSPS Subpart IIII Emissions Standards for Non-Methane Hydrocarbons (NMHC), Nitrogen Oxides (NOx), Carbon Monoxide (CO) and Particulate Matter (PM) shall be demonstrated by filing a copy of the unit's certification documentation of compliance with the NSPS Subpart IIII emissions standards, with the associated application.

VII. The following requirements of Regulation No. 6, Part A, Subpart A, General Provisions, shall apply:

- A. At all times, including periods of start-up, shutdown, and malfunction, the engine and control equipment shall, to the extent practicable, be maintained and operated in a manner consistent with good air pollution control practices for minimizing emissions. Determination of whether or not acceptable operating and maintenance procedures are being used will be based on information available to the Division, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. (Reference: Regulation No. 6, Part A, General Provisions from 40 CFR 60.11)
 B. No article, machine, equipment or process shall be used to conceal an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere. (§ 60.12)
 C. Written notification of construction and initial startup dates shall be submitted to the Division as required under § 60.7.
 D. Records of startups, shutdowns, and malfunctions shall be maintained, as required under § 60.7.

VIII. This engine meets all the requirements in New Source Performance Standard (NSPS) Subpart IIII as applicable to the specific engine, including the standards required for relocating into Colorado as set forth in Regulation No. 6, Part B, Section I.C.

I hereby certify that all information contained herein is complete, true and correct. I certify that this source is and will be operated in full compliance with the applicable tier standards of Colorado Air Quality Control Commission Regulation No. 6, Part A, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE) as well as all other requirements referenced herein.

Michael Grassmick

Vice President, Facilities Operations - QTS Federal

Name of Legally Authorized Person (Please Print)

Title

Michael Grassmick

Digitally signed by Michael Grassmick
 DN: C=US,
 E=michael.grassmick@qtsdatacenters.com,
 O=QTS Federal LLC, CN=Michael Grassmick
 Date: 2025.07.08 13:17:18-05'00'

7-8-2025

Signature of Legally Authorized Person

Date

¹ If the engine has not been selected or ordered as of the date of submission of the construction permit application, this form must be completed and submitted to the Colorado Air Pollution Control Division, for an affected engine, within one hundred and eighty (180) days after the commencement of construction/operation.

² This information can be obtained from the engine manufacturer.

³ Please enter this information if this form is being submitted after the date of submission of the construction permit application and a permit number and AIRS ID number have been assigned. Otherwise, leave these fields blank.

⁴ Supporting documentation includes: document(s) proving the date of first entry into Colorado (purchase receipt, delivery receipt, etc.) and tier standard certification information from the manufacturer, as applicable.



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

New Source Performance Standards (NSPS) – 40 CFR Part 60, Subpart IIII Applicability Air Pollutant Emission Notice (APEN) Addendum Form for Diesel Engines

Company Name: QTS Aurora, LLC

Engine Information¹

Make: Holt Caterpillar (CAT) Model: 3516C SN: TBD

1. Date of Engine Manufacture: TBD
2. Has this engine operated outside of the state of Colorado?

☐ Yes
☒ No
3. If you answered "Yes" to question 2, please answer the following question. (If you answered "No" to question 2, please leave this field blank.) What is the date of first entry into Colorado? _____
4. This engine was manufactured to meet the following tier level standards² (e.g., Tier 1, Tier 2): Tier 2

Permit #³: 22AR0210 AIRS ID³: 005 / 1777

A copy of this form, along with appropriate supporting documentation⁴, shall be maintained on-site or at a local field office, with stationary source responsibility, with a copy of the construction permit, exemption letter or general permit approval letter issued by the Colorado Air Pollution Control Division (the Division) for this emissions source. These records may be kept in either electronic or hard copy format provided that they can be promptly supplied to the Division or agents thereof upon request.

This engine shall comply with the New Source Performance Standards (NSPS) requirements of Colorado Air Quality Control Commission Regulation No. 6, Part A, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE) including, but not limited to, the following:

[The requirements below reflect the rule language of 40 CFR Part 60 Subpart IIII published in the Federal Register on 01/30/2013. However, if revisions to this Subpart are published at a later date, the owner or operator is subject to the requirements contained in the revised version of 40 CFR Part 60, Subpart IIII.]

- I. All fuel used shall meet the following specifications:
 - A. Sulfur content shall not exceed 15 ppm
 - B. Have a minimum cetane index of 40 or have a maximum aromatic compound content of 35% by volume
 - C. Compliance shall be demonstrated by maintaining copies of the fuel specifications provided by the supplier on-site or in a readily accessible location and made available to the Division for inspection upon request.
- II. The engine and control devices must be installed, configured, operated and maintained according to the specifications and instructions provided by the engine manufacturer.
- III. If the engine is equipped with a diesel particulate filter, the filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. Records shall be kept of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit is approached.
- IV. If the engine is used for emergency purposes, a non-resettable hour meter must be installed prior to start-up.
- V. If the diesel fuel-fired engine referenced herein avoids tier 4 or 4i requirements by being an emergency generator, the engine shall not be used for any purpose except emergency power generation and for the purpose of maintenance



checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited.

VI. Emission Standards:

- A. The engine referenced herein shall meet all the emissions standards applicable to the engine.
 B. Compliance with the NSPS Subpart IIII Emissions Standards for Non-Methane Hydrocarbons (NMHC), Nitrogen Oxides (NOx), Carbon Monoxide (CO) and Particulate Matter (PM) shall be demonstrated by filing a copy of the unit's certification documentation of compliance with the NSPS Subpart IIII emissions standards, with the associated application.

VII. The following requirements of Regulation No. 6, Part A, Subpart A, General Provisions, shall apply:

- A. At all times, including periods of start-up, shutdown, and malfunction, the engine and control equipment shall, to the extent practicable, be maintained and operated in a manner consistent with good air pollution control practices for minimizing emissions. Determination of whether or not acceptable operating and maintenance procedures are being used will be based on information available to the Division, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. (Reference: Regulation No. 6, Part A, General Provisions from 40 CFR 60.11)
 B. No article, machine, equipment or process shall be used to conceal an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere. (§ 60.12)
 C. Written notification of construction and initial startup dates shall be submitted to the Division as required under § 60.7.
 D. Records of startups, shutdowns, and malfunctions shall be maintained, as required under § 60.7.

VIII. This engine meets all the requirements in New Source Performance Standard (NSPS) Subpart IIII as applicable to the specific engine, including the standards required for relocating into Colorado as set forth in Regulation No. 6, Part B, Section I.C.

I hereby certify that all information contained herein is complete, true and correct. I certify that this source is and will be operated in full compliance with the applicable tier standards of Colorado Air Quality Control Commission Regulation No. 6, Part A, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE) as well as all other requirements referenced herein.

Michael Grassmick

Vice President, Facilities Operations - QTS Federal

Name of Legally Authorized Person (Please Print)

Title

Michael Grassmick

Digitally signed by Michael Grassmick
 DN: c=US,
 E=michael.grassmick@qtsdatacenters.com, O=QTS
 Federal LLC, CN=Michael Grassmick
 Date: 2025.07.08 13:17:51-05'00'

7-8-2025

Signature of Legally Authorized Person

Date

¹ If the engine has not been selected or ordered as of the date of submission of the construction permit application, this form must be completed and submitted to the Colorado Air Pollution Control Division, for an affected engine, within one hundred and eighty (180) days after the commencement of construction/operation.

² This information can be obtained from the engine manufacturer.

³ Please enter this information if this form is being submitted after the date of submission of the construction permit application and a permit number and AIRS ID number have been assigned. Otherwise, leave these fields blank.

⁴ Supporting documentation includes: document(s) proving the date of first entry into Colorado (purchase receipt, delivery receipt, etc.) and tier standard certification information from the manufacturer, as applicable.



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

New Source Performance Standards (NSPS) – 40 CFR Part 60, Subpart IIII Applicability Air Pollutant Emission Notice (APEN) Addendum Form for Diesel Engines

Company Name: QTS Aurora, LLC

Engine Information¹

Make: Yancey Caterpillar (CAT) Model: 3516C SN: TBD

1. Date of Engine Manufacture: TBD
2. Has this engine operated outside of the state of Colorado?

☐ Yes
☒ No
3. If you answered "Yes" to question 2, please answer the following question. (If you answered "No" to question 2, please leave this field blank.) What is the date of first entry into Colorado? _____
4. This engine was manufactured to meet the following tier level standards² (e.g., Tier 1, Tier 2): Tier 2

Permit #³: 22AR0210 AIRS ID³: 005 / 1777

A copy of this form, along with appropriate supporting documentation⁴, shall be maintained on-site or at a local field office, with stationary source responsibility, with a copy of the construction permit, exemption letter or general permit approval letter issued by the Colorado Air Pollution Control Division (the Division) for this emissions source. These records may be kept in either electronic or hard copy format provided that they can be promptly supplied to the Division or agents thereof upon request.

This engine shall comply with the New Source Performance Standards (NSPS) requirements of Colorado Air Quality Control Commission Regulation No. 6, Part A, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE) including, but not limited to, the following:

[The requirements below reflect the rule language of 40 CFR Part 60 Subpart IIII published in the Federal Register on 01/30/2013. However, if revisions to this Subpart are published at a later date, the owner or operator is subject to the requirements contained in the revised version of 40 CFR Part 60, Subpart IIII.]

- I. All fuel used shall meet the following specifications:
 - A. Sulfur content shall not exceed 15 ppm
 - B. Have a minimum cetane index of 40 or have a maximum aromatic compound content of 35% by volume
 - C. Compliance shall be demonstrated by maintaining copies of the fuel specifications provided by the supplier on-site or in a readily accessible location and made available to the Division for inspection upon request.
- II. The engine and control devices must be installed, configured, operated and maintained according to the specifications and instructions provided by the engine manufacturer.
- III. If the engine is equipped with a diesel particulate filter, the filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. Records shall be kept of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit is approached.
- IV. If the engine is used for emergency purposes, a non-resettable hour meter must be installed prior to start-up.
- V. If the diesel fuel-fired engine referenced herein avoids tier 4 or 4i requirements by being an emergency generator, the engine shall not be used for any purpose except emergency power generation and for the purpose of maintenance



checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited.

VI. Emission Standards:

- A. The engine referenced herein shall meet all the emissions standards applicable to the engine.
- B. Compliance with the NSPS Subpart IIII Emissions Standards for Non-Methane Hydrocarbons (NMHC), Nitrogen Oxides (NOx), Carbon Monoxide (CO) and Particulate Matter (PM) shall be demonstrated by filing a copy of the unit's certification documentation of compliance with the NSPS Subpart IIII emissions standards, with the associated application.

VII. The following requirements of Regulation No. 6, Part A, Subpart A, General Provisions, shall apply:

- A. At all times, including periods of start-up, shutdown, and malfunction, the engine and control equipment shall, to the extent practicable, be maintained and operated in a manner consistent with good air pollution control practices for minimizing emissions. Determination of whether or not acceptable operating and maintenance procedures are being used will be based on information available to the Division, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. (Reference: Regulation No. 6, Part A, General Provisions from 40 CFR 60.11)
- B. No article, machine, equipment or process shall be used to conceal an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere. (§ 60.12)
- C. Written notification of construction and initial startup dates shall be submitted to the Division as required under § 60.7.
- D. Records of startups, shutdowns, and malfunctions shall be maintained, as required under § 60.7.

VIII. This engine meets all the requirements in New Source Performance Standard (NSPS) Subpart IIII as applicable to the specific engine, including the standards required for relocating into Colorado as set forth in Regulation No. 6, Part B, Section I.C.

I hereby certify that all information contained herein is complete, true and correct. I certify that this source is and will be operated in full compliance with the applicable tier standards of Colorado Air Quality Control Commission Regulation No. 6, Part A, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE) as well as all other requirements referenced herein.

Michael Grassmick

Vice President, Facilities Operations - QTS Federal

Name of Legally Authorized Person (Please Print)

Title

Michael Grassmick

Digitally signed by Michael Grassmick
DN: C=US, E=michael.grassmick@qtsdatacenters.com, O=QTS
Federal LLC, CN=Michael Grassmick
Date: 2025.07.08 13:18:17-0500

7-8-2025

Signature of Legally Authorized Person

Date

¹ If the engine has not been selected or ordered as of the date of submission of the construction permit application, this form must be completed and submitted to the Colorado Air Pollution Control Division, for an affected engine, within one hundred and eighty (180) days after the commencement of construction/operation.

² This information can be obtained from the engine manufacturer.

³ Please enter this information if this form is being submitted after the date of submission of the construction permit application and a permit number and AIRS ID number have been assigned. Otherwise, leave these fields blank.

⁴ Supporting documentation includes: document(s) proving the date of first entry into Colorado (purchase receipt, delivery receipt, etc.) and tier standard certification information from the manufacturer, as applicable.

Facility Wide Emissions Inventory Form

Ver. September, 2019



Company Name: QTS Aurora, LLC

Source Name: QTS DEN1

Source AIRS ID: 005-1777

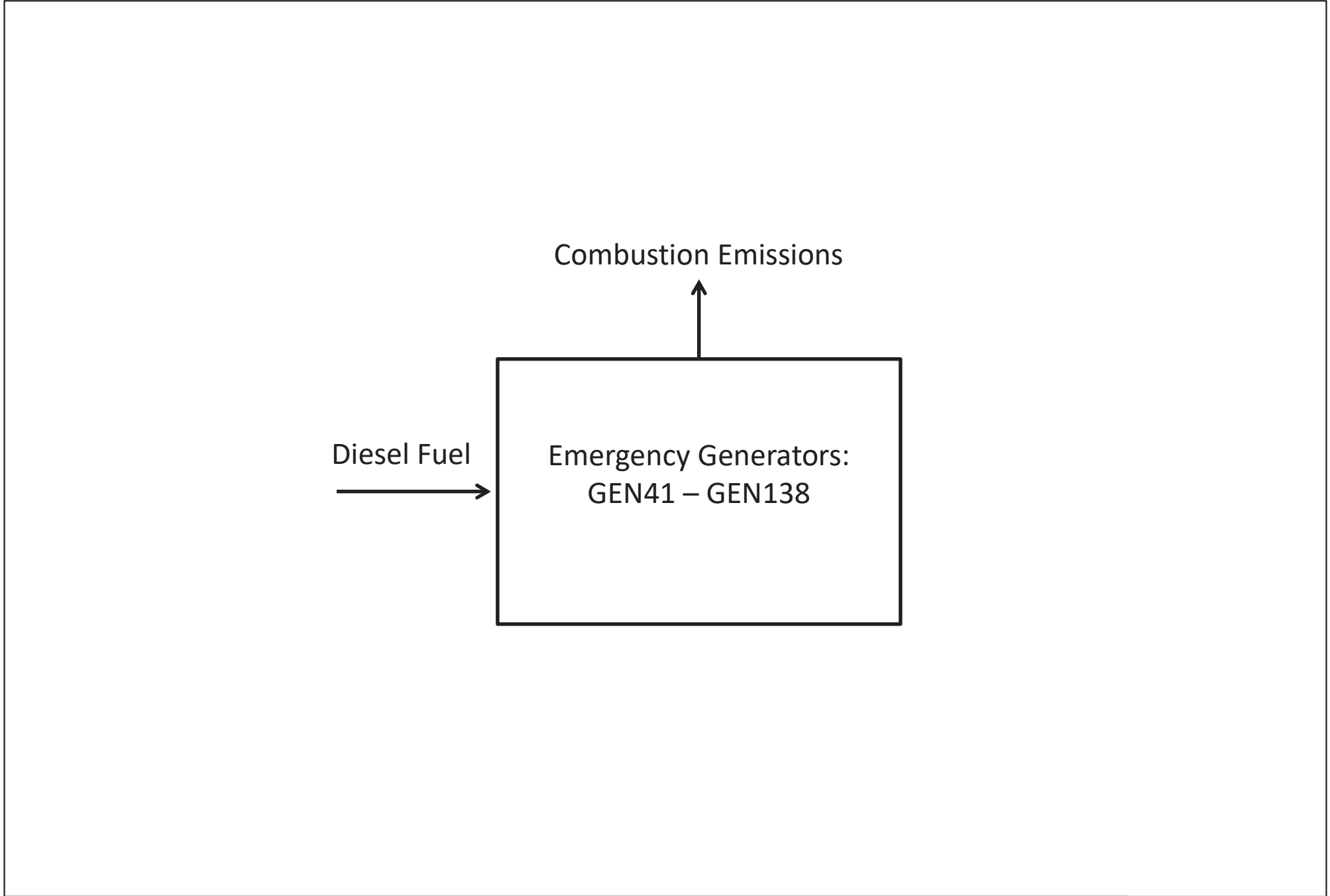
			Uncontrolled Potential to Emit (PTE)													Controlled Potential to Emit (PTE)																		
			Criteria (TPY)							HAPs (lbs/yr)						Criteria (TPY)							HAPs (lbs/yr)											
AIRS ID	Permit No.	Description	TSP	PM10	PM2.5	FUG. TSP	FUG. PM10	FUG. PM2.5	SO2	NOx	VOC	CO	Benzene	Toluene	EB	Xylene	n-Hex	HCHO	TSP	PM10	PM2.5	FUG. TSP	FUG. PM10	FUG. PM2.5	SO2	NOx	VOC	CO	Benzene	Toluene	EB	Xylene	n-Hex	HCHO
/005/1777	22AR0210	DC1 Emergency Generators (GEN01, GEN40)	21.5	17.6	17.1				0.5	679.5	88.6	328.9	0	0		0		0	0.8	0.7	0.6				0.0	24.9	3.3	12.1	0	0		0		0
/005/1777	22AR0210	DC2 and DC3 Emergency Generators (GEN41, GEN138)	23.8	0.3	19.0				1.1	1432.8	68.0	251.0	0	0		0		0	1.7	1.4	1.4				0.1	24.9	5.1	18.1	0	0		0		0
Permitted Sources Subtotal =			45.3	18.0	36.1	0.0	0.0	0.0	1.5	2112.2	156.6	579.8	1	0	0	0	0	0	2.5	2.1	2.0	0.0	0.0	0.0	0.1	49.8	8.4	30.1	0	0	0	0	0	0
APEN Only - Permit Exempt Sources																																		
APEN Only Subtotal =			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	
APEN Exempt / Insignificant Sources																																		
Insignificant Subtotal =			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0		
Total, All Sources =			45.3	18.0	36.1	0.0	0.0	0.0	1.5	2112.2	156.6	579.8	1	0	0	0	0	0	2.5	2.1	2.0	0.0	0.0	0.0	0.1	49.8	8.4	30.1	0	0	0	0	0	
Uncontrolled HAPs Summary (TPY) =			0.0 0.0 0.0 0.0 0.0 0.0						Controlled HAPs Summary (TPY) = 0.0 0.0 0.0 0.0 0.0 0.0																									
Uncontrolled Total, All HAPs (TPY) =			0.0						Controlled Total, All HAPs (TPY) = 0.0																									

Footnotes:

- This form should be completed to include both existing sources and all proposed new or modifications to existing emissions sources
- If the emissions source is new then enter "proposed" under the Permit No. and AIRS ID data columns
- Add and/or replace HAPs and other Non-Criteria Reportable Pollutants as necessary. HAP abbreviations include:
EB = Ethylbenzene Acro = Acrolein
HCHO = Formaldehyde n-Hex = n-Hexane
224-TMP = 2,2,4-Trimethylpentane Meth = Methanol
Acetal = Acetaldehyde
- APEN Exempt/Insignificant Sources should be included when warranted.



APPENDIX B PROCESS FLOW DIAGRAM, PLOT PLAN,
AND SITE MAP



Environmental Resources Management		
DESIGN: B. WILDEY	DRAWN: M. TRACY-BURFORD	CHKD.: B. CRUTCHFIELD
DATE: 04/14/2025	SCALE: n/a	REVISION: 0.0

Attachment B - Process Flow Diagram
QTS DEN1 DC2 and DC3
Arapahoe County, Colorado



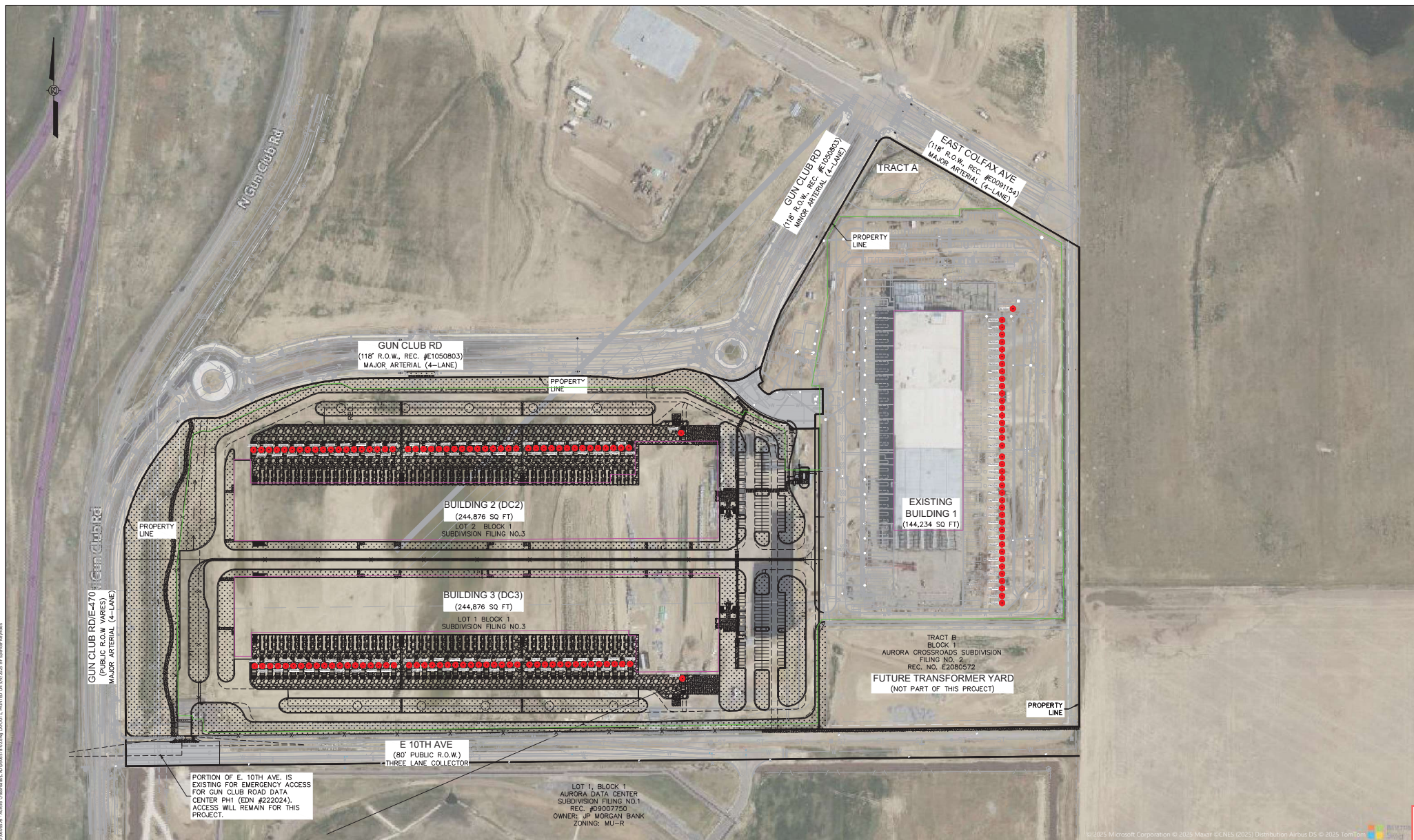


QTS Data Center Site 1160 N Gun Club Rd, Aurora, CO 80018

NAD83 LAT/LONG

39.73328405466354

-104.71058766929782



LEGEND:

- FENCE
- BUILDING
- GENERATOR



Rev.	Date	Description	By	C



OVERALL SITE PLAN

AURORA CROSSROADS SUBDIVISION
1160 NORTH GUN CLUB ROAD
AURORA, COLORADO 80018

SCALE	DESIGNED BY	PROJECT NUMBER	SHEET NO.
1"=110'	BW		
DATE DRAWN	DRAWN BY	0606578	1

Environmental Resources Management

RECEIVED 7/8/2025



APPENDIX C DETAILED EMISSIONS CALCULATIONS

Title Page

Product:

Process:

Process Cycle Time: 365 days

Final Product Amount: 98893.0 gal

Evaluation Date: 6/4/2025

File Name: untitled.emm

Connected Database: Emaster = \\azusevmlic01\EMTanks\Emaster

Calculation type: MACT98

Condenser Calc. type: Zero Stage

Charge Calc. type: Initial Composition

Material Balance: No Emissions Subtracted

Last Saved User:

Last Saved Time:

Comment:

Defined Activities

- 1) [Storage] DEN 9500 Gal Uncontrolled
- 2) [Storage] DEN 9500 Gal DC1 Controlled
- 3) [Storage] DEN 9500 Gal DC2 Controlled
- 4) [Storage] DEN 9500 Gal DC3 Controlled

1: Storage Tank Activity

Title: DEN 9500 Gal Uncontrolled

Start Date: 1/1/2025

End Date: 12/31/2025

Elapsed Time: 365.0 days

Vent ID:

Noncondensable: Air @ 0 scfh

Saturation: 100%

Pressure: 624.5442 mmHg

Using Monthly Avg. Temp.

Location: Colorado, Denver Volume Throughput: 87650.0 gal

Crude Oil Factor-Kc: 1

Vessel Name: Denver 9500 Gal

Void Vol.: 9,776.31 gal Work Vol.: 9,458 gal

No Control Devices

Final Contents	9500.0 gal	67468.387 lb	0.04 °C			
	Weight	Pure-Vp	W[i]	X[i]	A[i]	X*Vp*A
[Liquid Phase]	(lb)	(mmHg)				(mmHg)
Distillate Fuel Oil No. 2	67468.387	0.1159	1.0	1.0	1	0.1159

Emissions From Vessel: Denver 9500 Gal

	Effective Vp	Working	Breathing	Total	Rate
[Non Condensables]	(mm Hg)	(lb)	(lb)	(lb)	(lb/hr)
Air	624.2497	746.1904	607.6461	1353.8365	0.1545
[Condensables]	(mm Hg)	(lb)	(lb)	(lb)	(lb/hr)
Distillate Fuel Oil No. 2	0.2945	2.2338	1.9112	4.145	5.0e-4

2: Storage Tank Activity

Title: DEN 9500 Gal DC1 Controlled

Start Date: 1/1/2025

End Date: 12/31/2025

Elapsed Time: 365.0 days

Vent ID:

Noncondensable: Air @ 0 scfh

Saturation: 100%

Pressure: 624.5442 mmHg

Using Monthly Avg. Temp.

Location: Colorado, Denver Volume Throughput: 3212.0 gal

Crude Oil Factor-Kc: 1

Vessel Name: Denver 9500 Gal

Void Vol.: 9,776.31 gal Work Vol.: 9,458 gal

No Control Devices

Final Contents	9500.0 gal	67468.387 lb	0.04 °C			
	Weight	Pure-Vp	W[i]	X[i]	A[i]	X*Vp*A
[Liquid Phase]	(lb)	(mmHg)				(mmHg)
Distillate Fuel Oil No. 2	67468.387	0.1159	1.0	1.0	1	0.1159

Emissions From Vessel: Denver 9500 Gal

	Effective Vp	Working	Breathing	Total	Rate
[Non Condensables]	(mm Hg)	(lb)	(lb)	(lb)	(lb/hr)
Air	624.2423	27.3447	607.6461	634.9908	0.0725
[Condensables]	(mm Hg)	(lb)	(lb)	(lb)	(lb/hr)
Distillate Fuel Oil No. 2	0.3019	0.0819	1.9112	1.993	2.0e-4

3: Storage Tank Activity

Title: DEN 9500 Gal DC2 Controlled

Start Date: 1/1/2025

End Date: 12/31/2025

Elapsed Time: 365.0 days

Vent ID:

Noncondensable: Air @ 0 scfh

Saturation: 100%

Pressure: 624.5442 mmHg

Using Monthly Avg. Temp.

Location: Colorado, Denver Volume Throughput: 6311.0 gal

Crude Oil Factor-Kc: 1

Vessel Name: Denver 9500 Gal

Void Vol.: 9,776.31 gal Work Vol.: 9,458 gal

No Control Devices

Final Contents	9500.0 gal	67468.387 lb	0.04 °C			
	Weight	Pure-Vp	W[i]	X[i]	A[i]	X*Vp*A
[Liquid Phase]	(lb)	(mmHg)				(mmHg)
Distillate Fuel Oil No. 2	67468.387	0.1159	1.0	1.0	1	0.1159

Emissions From Vessel: Denver 9500 Gal

	Effective Vp	Working	Breathing	Total	Rate
[Non Condensables]	(mm Hg)	(lb)	(lb)	(lb)	(lb/hr)
Air	624.2429	53.7274	607.6461	661.3735	0.0755
[Condensables]	(mm Hg)	(lb)	(lb)	(lb)	(lb/hr)
Distillate Fuel Oil No. 2	0.3014	0.1608	1.9112	2.072	2.0e-4

4: Storage Tank Activity

Title: DEN 9500 Gal DC3 Controlled

Start Date: 1/1/2025

End Date: 12/31/2025

Elapsed Time: 365.0 days

Vent ID:

Noncondensable: Air @ 0 scfh

Saturation: 100%

Pressure: 624.5442 mmHg

Using Monthly Avg. Temp.

Location: Colorado, Denver Volume Throughput: 1720 gal

Crude Oil Factor-Kc: 1

Vessel Name: Denver 9500 Gal

Void Vol.: 9,776.31 gal Work Vol.: 9,458 gal

No Control Devices

Final Contents	9500.0 gal	67468.387 lb	0.04 °C			
	Weight	Pure-Vp	W[i]	X[i]	A[i]	X*Vp*A
[Liquid Phase]	(lb)	(mmHg)				(mmHg)
Distillate Fuel Oil No. 2	67468.387	0.1159	1.0	1.0	1	0.1159

Emissions From Vessel: Denver 9500 Gal

	Effective Vp	Working	Breathing	Total	Rate
[Non Condensables]	(mm Hg)	(lb)	(lb)	(lb)	(lb/hr)
Air	624.242	14.6429	607.6461	622.289	0.071
[Condensables]	(mm Hg)	(lb)	(lb)	(lb)	(lb/hr)
Distillate Fuel Oil No. 2	0.3022	0.0438	1.9112	1.955	2.0e-4

Summary Page

Emissions for (Unspecified Vent):

	CAS	Avg. Rate	Max. Rate	Total Weight
Air	132259-10-0	0.3736 lb/hr	0.1545 lb/hr	3272.4898 lb
Distillate Fuel Oil No. 2	64742-47-8	0.0012 lb/hr	5.0e-4 lb/hr	10.165 lb

Total emissions for all vents:

	CAS	Avg. Rate	Max. Rate	Total Weight
Air	132259-10-0	0.3736 lb/hr	0.1545 lb/hr	3272.4898 lb
Distillate Fuel Oil No. 2	64742-47-8	0.0012 lb/hr	5.0e-4 lb/hr	10.165 lb



APPENDIX D ENGINE MANUFACTURER SPECIFICATIONS
AND EMISSIONS DATA

Model: KD2500, continued

Exhaust

Exhaust System

Exhaust flow at rated kW, m ³ /min. (cfm)	579 (20447)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	500 (932)
Maximum allowable back pressure, kPa (in. Hg)	8.5 (2.5)
Exh. outlet size at eng. hookup, mm (in.)	See ADV Drawing

Engine Electrical

Engine Electrical System

Starter motor qty. at starter motor power rating, rated voltage (DC)	Standard: 2 @ 9 kW, 24
Battery charging alternator: Ground (negative/positive)	Negative
Battery charging alternator: Volts (DC)	24
Battery charging alternator: Ampere rating	140
Quantity, CCA rating each, type (with standard starters)	4, 1110, AGM
Battery voltage (DC)	12

Fuel

Fuel System

Fuel type	Diesel
Fuel supply line, min. ID, mm (in.)	25 (1.0)
Fuel return line, min. ID, mm (in.)	19 (0.75)
Max. fuel flow, Lph (gph)	881 (232.7)
Min./max. fuel pressure at engine supply connection, kPa (in. Hg)	-30/30 (-8.8/8.8)
Max. return line restriction, kPa (in. Hg)	30 (8.9)

Lubrication

Lubrication System

Type	Full Pressure
Oil pan capacity with filter, L (qt.)	335 (354)
Oil filter: quantity, type	6, Cartridge
Oil cooler	Water-Cooled

Cooling

Radiator System

Ambient temperature, °C (°F)	50 (122)
Engine jacket water flow, Lpm (gpm)	2082 (550)
Engine jacket water capacity, L (gal.)	356 (94)
Radiator system capacity, including engine, L (gal.)	643 (170)
Charge cooler water flow, Lpm (gpm)	662 (174)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	870 (49476)
Heat rejected to charge air cooling water at rated kW, dry exhaust, Kw Btu/min.	760 (43220)
Fan diameter, including blades, mm (in.)	2434 (96)
Fan, kWm (HP)	90 (120.7)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H ₂ O)	0.125 (0.5)

* Enclosure with enclosed silencer reduces ambient temperature capability by 5 °C (9 °F)

Model: KD2500, continued

Air Requirements

Radiator-cooled cooling air, m3/min. (scfm) *	2549 (90000)
Cooling air required for generator set when equipped with city water cooling or remote radiator, based on 14°C (25°F) rise, m3/min. rise and ambient temp. of 29°C (85°F) m3/min. (cfm)	1116 (39398)
Combustion air, m3/min. (cfm)	208 (7345)
Heat rejected to ambient air: Engine, kW (Btu/min.)	150 (8530)
Heat rejected to ambient air: Alternator, kW (Btu/min.)	160 (9099)

*Air density = 1.20 kg/m3 (0.075 lbm/ft3)

Fuel Consumption

Diesel, Lph (gph), at % load	Rating
Standby Fuel Consumption at 100% load	651 Lph (172.0 gph)
Standby Fuel Consumption at 75% load	572 Lph (151.0 gph)
Standby Fuel Consumption at 50% load	389 Lph (102.8 gph)
Standby Fuel Consumption at 25% load	222 Lph (58.7 gph)

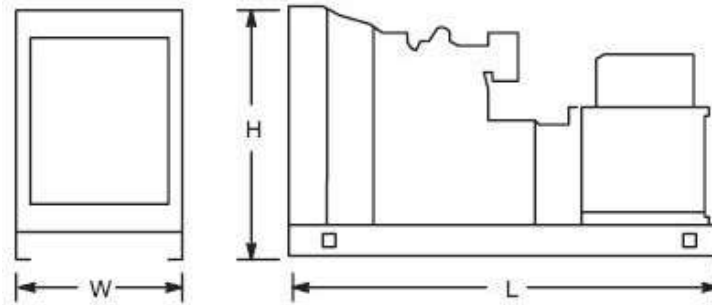
Dimensions and Weights

Dim Weight Spec

Fuel
Engine Manufacturer
Overall Size, L x W x H, mm (in.):
Weight (radiator model), wet, kg (lb.):

Dim Weight Value

Diesel
Kohler
6957 x 2852 x 3307 (273.9 x 112.3 x 130.2)
27033 (59598)



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.



Emissions Data



KD2500

60 Hz. Diesel Generator Set Tier 2 EPA Certified for Stationary Emergency Applications EMISSION OPTIMIZED DATA SHEET

ENGINE INFORMATION

Model:	KD62V12	Bore:	175 mm (6.89 in.)
Nameplate kW @ 1800 RPM:	2700	Stroke:	215 mm (8.46 in.)
Type:	4-Cycle, 12-V Cylinder	Displacement:	62 L (3783 cu. in.)
Aspiration:	Turbocharged, Intercooled	EPA Family:	MLHAL103.ESP
Compression ratio:	16:0:1	EPA Certificate:	MLHAL103.ESP-001
Emission Control Device:	Direct Diesel Injection, Engine Control Module, Turbocharger, Charge Air Cooler		

EXHAUST EMISSION DATA:

EPA D2 Cycle 5-mode weighted

HC	0.17 g/kWh
NO _x (Oxides of Nitrogen as NO ₂)	5.28 g/kWh
CO (Carbon Monoxide)	1.22 g/kWh
PM (Particulate Matter)	0.14 g/kWh

TEST METHODS AND CONDITIONS

Test Methods:

Steady-State emissions recorded per EPA CFR 40 Part 89, and ISO8178-1 during operation at rated engine speed (+/-2%) and stated constant load (+/-2%) with engine temperatures, pressures and emission rates stabilized.

Fuel Specification:

40-48 Cetane Number, 0.05 Wt. % max. Sulfur; Reference ISO8178-5, 40CFR86.1313-98 Type 2-D and ASTM D975 No. 2-D.

Reference Conditions:

25 °C (77 °F) Air Inlet Temperature, 40 °C (104 °F) Fuel Inlet Temperature, 100 kPa (29.53 in Hg) Barometric Pressure; 10.7 g/kg (75 grains H₂O/lb.) of dry air Humidity (required for NO_x correction); Intake Restriction set to maximum allowable limit for clean filter; Exhaust Back pressure set to maximum allowable limit.

Data was taken from a single engine test according to the test methods, fuel specification and reference conditions stated above and is subjected to instrumentation and engine-to-engine variability. Tests conducted with alternate test methods, instrumentation, fuel or reference conditions can yield different results.

Data and specifications subject to change without notice.



KD2500

60 Hz. Diesel Generator Set Tier 2 EPA Certified for Stationary Emergency Applications EMISSION OPTIMIZED DATA SHEET

ENGINE INFORMATION

Model:	KD62V12	Bore:	175 mm (6.89 in.)
Type:	4-Cycle, 12-V Cylinder	Stroke:	215 mm (8.46 in.)
Aspiration:	Turbocharged, Intercooled	Displacement:	62 L (3783 cu. in.)
Compression ratio:	16:0:1		
Emission Control Device:	Direct Diesel Injection, Engine Control Module, Turbocharger, Charge Air Cooler		

NOMINAL EMISSION DATA

Cycle point	100% ESP	75% ESP	50% ESP	25% ESP
Power [kW]	2700	2025	1350	675
Speed [rpm]	1800	1800	1800	1800
Exhaust Gas Flow [kg/h]	15085	15390	10714	6183
Exhaust Gas Temperature [C]	456	464	447	464
NO _x [g/kWh]	9.5	4.5	4.9	5.0
CO [g/kWh]	0.3	1.2	0.7	2.6
HC [g/kWh]	0.12	0.10	0.18	0.29
PM [g/kWh]	0.06	0.16	0.12	0.34

NOT TO EXCEED EMISSION DATA

Cycle point	100% ESP	75% ESP	50% ESP	25% ESP
NO _x [g/kWh]	11.2	5.3	5.7	5.9
CO [g/kWh]	1.0	3.5	1.9	7.4
HC [g/kWh]	0.14	0.12	0.21	0.34
PM [g/kWh]	0.10	0.20	0.15	0.40

TEST METHODS AND CONDITIONS

Test Methods:

Steady-State emissions recorded per EPA CFR 40 Part 89, and ISO8178-1 during operation at rated engine speed (+/-2%) and stated constant load (+/-2%) with engine temperatures, pressures and emission rated stabilized.

Fuel Specification:

40-48 Cetane Number, 0.05 Wt. % max. Sulfur; Reference ISO8178-5, 40CFR86.1313-98 Type 2-D and ASTM D975 No. 2-D.

Reference Conditions:

25 °C (77 °F) Air Inlet Temperature, 40 °C (104 °F) Fuel Inlet Temperature, 100 kPa (29.53 in Hg) Barometric Pressure; 10.7 g/kg (75 grains H₂O/lb.) of dry air Humidity (required for NO_x correction); Intake Restriction set to maximum allowable limit for clean filter; Exhaust Back pressure set to maximum allowable limit.

Data was taken from a single engine test according to the test methods, fuel specification and reference conditions stated above and is subjected to instrumentation and engine-to-engine variability. Tests conducted with alternate test methods, instrumentation, fuel or reference conditions can yield different results.

Data and specifications subject to change without notice.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2021 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Liebherr Machines Bulle SA**
(U.S. Manufacturer or Importer)

Certificate Number: **MLHAL103.ESP-001**

Effective Date:

09/30/2020

Expiration Date:

12/31/2021

Byron J. Bunker, Division Director
Compliance Division

Issue Date:

09/30/2020

Revision Date:

N/A

Model Year: 2021

Manufacturer Type: Original Engine Manufacturer

Engine Family: MLHAL103.ESP

Mobile/Stationary Indicator: Stationary

Emissions Power Category: kW>560

Fuel Type: Diesel

After Treatment Devices: No After Treatment Devices Installed

Non-after Treatment Devices: Electronic Control

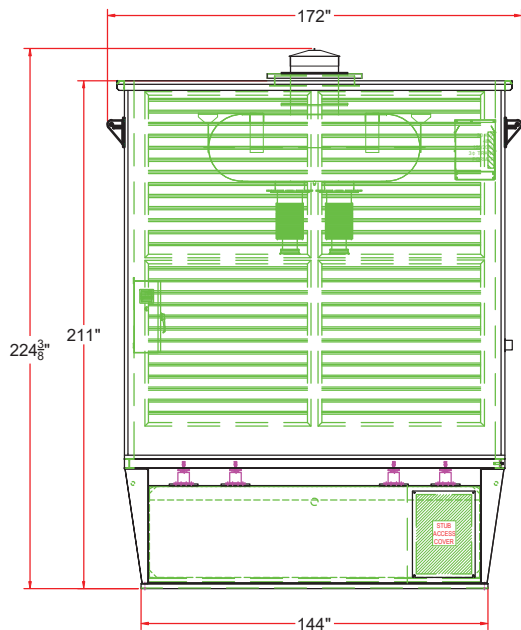
Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

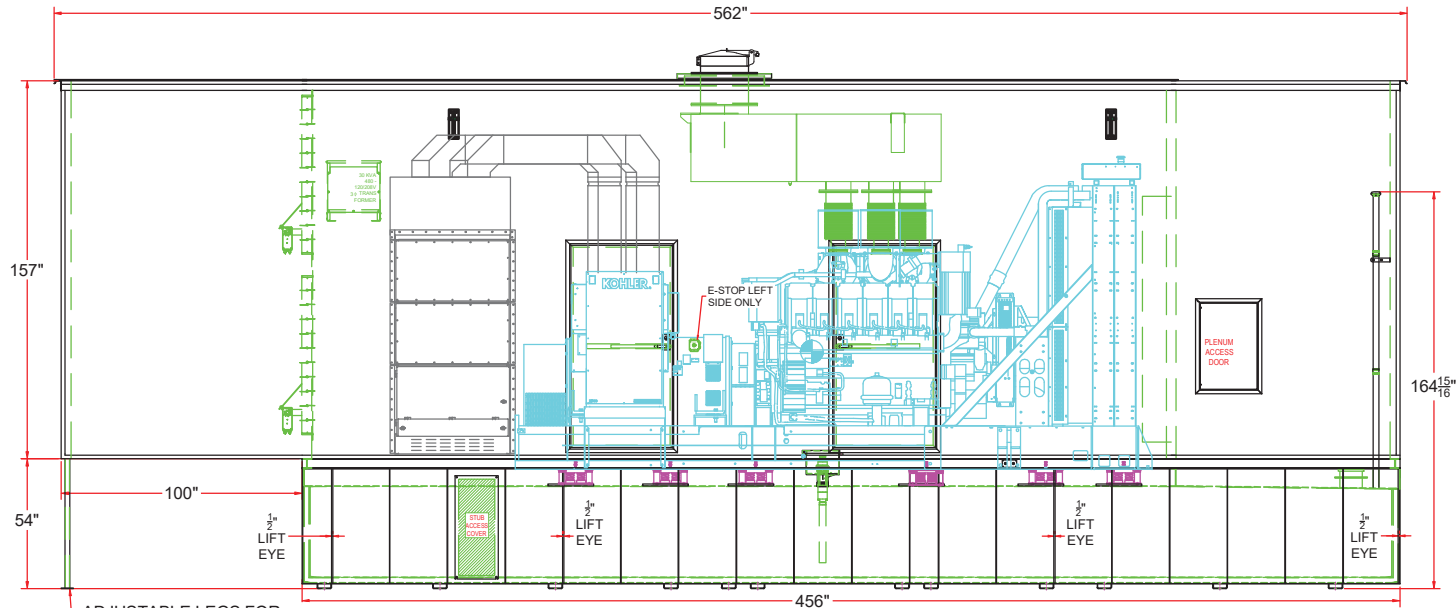
It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

The actual engine power may lie outside the limits of the Emissions Power Category shown above. See the certificate application for details.



REAR VIEW



RIGHT SIDE VIEW



1900 NE 25TH AVE, OCALA, FL 34470
PHONE (352) 414-4700 FAX (352) 414-4642

ENCL. WEIGHT	TANK WEIGHT	GEN. WEIGHT	TOTAL WEIGHT	DL #142 Pilot No. NEEPCSS
12,000 LBS.	22,000 LBS.	53,363 LBS.	87,363 LBS.	
CUSTOMER:				 THIRD-ANGLE PROJECTION
NIXON POWER				
KOHLER KD2500 OPEN, ALT: KH08430T04D				
DESCRIPTION ASSEMBLY				DESIGNATION DL3
FIDELITY MANUFACTURING, LLC. CLAIMS PROPRIETARY RIGHT IN THE MATERIAL DISCLOSED HEREON. THIS DRAWING IS ISSUED FOR SALES INFORMATION ONLY AND MAY NOT BE REPRODUCED OR USED TO MANUFACTURE ANYTHING SHOWN HEREON WITHOUT PERMISSION FROM FIDELITY MANUFACTURING, LLC. TO THE USER, FIDELITY MANUFACTURING, LLC. IS NOT RESPONSIBLE FOR ERRORS DUE TO INSUFFICIENT TECHNICAL SPECS, GENSET DRAWINGS, OR OTHER PROVIDED INFORMATION.				

USEABLE GALLONS / dBA REDUCTION

8,300 AT 90% / 15

QTS DENVER

QTS-KOH2500-DVR

DRW.	JAL	QTS-KOH2500-DVR	Page 8
CHK.	SH		
APP.	-		
DATE	10/26/2021		
SCALE:		SHEET	3 OF 15

RECEIVED 7/8/2025

www.fidelitymfg.co



Diesel Generator Set

MTU 20V4000 DS2500 50 °C

2,500 kWe/60 Hz/Standby/380 - 13,800V

System ratings

Voltage (L-L)	380V † ‡	416V † ‡	440V † ‡	480V † ‡	600V ‡
Phase	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60
kW	2,500	2,500	2,500	2,500	2,500
kVA	3,125	3,125	3,125	3,125	3,125
Amps	4,748	4,337	4,100	3,759	3,007
skVA@30% voltage dip	6,899	7,803	8,729	8,028	7,058
Generator model*	841-M70-M	841-VL85-M	841-VL85-M	841-M70-M	841-M70-M
Temp rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE

Voltage (L-L)	4,160V	12,470V	13,200V	13,800V
Phase	3	3	3	3
PF	0.8	0.8	0.8	0.8
Hz	60	60	60	60
kW	2,500	2,500	2,500	2,500
kVA	3,125	3,125	3,125	3,125
Amps	434	145	137	131
skVA@30% voltage dip	7,086	4,060	4,549	4,973
Generator model*	841-M70-M	4P6.6-2975-M	4P6.6-2975-M	4P6.6-2975-M
Temp rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE	6 LEAD WYE

* Consult the factory for alternate configuration.

† UL 2200 offered

‡ CSA offered

Certifications and standards

- Emissions
 - EPA Tier 2 certified
- Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- Seismic certification – optional
 - IBC certification
 - OSHPD pre-approval
- UL 2200 - optional (refer to *System ratings* for availability)
- CSA – optional (refer to *System ratings* for availability)
 - CSA C22.2 No. 100
 - CSA C22.2 No. 14
- Performance Assurance Certification (PAC)
 - Generator set tested to ISO 8528-5 for transient response
 - Verified product design, quality, and performance integrity
 - All engine systems are prototype and factory tested
- Power rating
 - Accepts rated load in one step per NFPA 110
 - Permissible average power output during 24 hours of operation is approved up to 85%.

Standard features *

- MTU is a single source supplier
- Global product support
- 2 year standard warranty
- 20V4000 diesel engine
 - 95.4 liter displacement
 - Common rail fuel injection
 - 4-cycle
- Complete range of accessories
- Cooling system
 - Integral set-mounted
 - Engine-driven fan
- Generator
 - Brushless, rotating field generator
 - 2/3 pitch windings
 - PMG (Permanent Magnet Generator) supply to regulator
 - 300% short circuit capability
- Digital control panel(s)
 - UL recognized, CSA certified, NFPA 110
 - Complete system metering
 - LCD display

Standard equipment *

Engine

- Air cleaners
- Oil pump
- Oil drain extension and S/O valve
- Full flow oil filter
- Closed crankcase ventilation
- Jacket water pump
- Inter cooler water pump
- Thermostats
- Blower fan and fan drive
- Radiator - unit mounted
- Electric starting motor - 24V
- Governor – electronic isochronous
- Base - structural steel
- SAE flywheel and bell housing
- Charging alternator - 24V
- Battery box and cables
- Bulkhead fuel connectors
- Flexible exhaust connection
- EPA certified engine
- No load to full load regulation
- Brushless alternator with brushless pilot exciter
- 4 pole, rotating field
- 130 °C maximum standby temperature rise
- 2-bearing, sealed
- Flexible coupling
- Full amortisseur windings
- 125% rotor balancing
- 3-phase voltage sensing
- ±0.25% voltage regulation
- 100% of rated load - one step
- 5% maximum total harmonic distortion

Digital control panel(s)

- Digital metering
- Engine parameters
- Generator protection functions
- Engine protection
- CANBus ECU communications
- Windows®-based software
- Multilingual capability
- Remote communications to RDP-110 remote annunciator
- Programmable input and output contacts
- UL recognized, CSA certified, CE approved
- Event recording
- IP 54 front panel rating with integrated gasket
- NFPA 110 compatible

Generator

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting
- Sustained short circuit current of up to 300% of the rated current for up to 10 seconds
- Self-ventilated and drip-proof
- Superior voltage waveform
- Digital, solid state, volts-per-hertz regulator

Application data

Engine

Manufacturer	MTU
Model	20V4000G64S
Type	4-cycle
Arrangement	20-V
Displacement: L (in ³)	95.4 (5,822)
Bore: cm (in)	17 (6.69)
Stroke: cm (in)	21 (8.27)
Compression ratio	16.4:1
Rated rpm	1,800
Engine governor	electronic isochronous (ADEC)
Maximum power: kWm (bhp)	2,740 (3,674)
Speed regulation	± 0.25%
Air cleaner	dry

Liquid capacity (Lubrication)

Total oil system: L (gal)	390 (103)
Engine jacket water capacity: L (gal)	205 (54.2)
After cooler water capacity: L (gal)	50 (13.2)
System coolant capacity: L (gal)	814 (215)

Electrical

Electric volts DC	24
Cold cranking amps under -17.8 °C (0 °F)	4,200

Fuel system

Fuel supply connection size	-16 JIC 37° female 1" NPT adapter provided
Fuel return connection size	-16 JIC 37° female 1" NPT adapter provided
Maximum fuel lift - cranking: m (ft)	1 (3.3)*
Maximum fuel lift - running: m (ft)	3.1 (10)
Recommended fuel	diesel #2
Total fuel flow: L/hr (gal/hr)	1,620 (428)

* Fuel lift pump for cranking increases lift to: m (ft) 3.1 (10)

Fuel consumption

At 100% of power rating: L/hr (gal/hr)	636 (168)
At 75% of power rating: L/hr (gal/hr)	507 (134)
At 50% of power rating: L/hr (gal/hr)	363 (96)

Cooling - radiator system

Ambient capacity of radiator: °C (°F)	50 (122)
Maximum restriction of cooling air: intake and discharge side of radiator: kPa (in. H ₂ O)	0.12 (0.5)
Water pump capacity: L/min (gpm)	1,567 (414)
After cooler pump capacity: L/min (gpm)	567 (150)
Heat rejection to coolant: kW (BTUM)	940 (53,456)
Heat rejection to after cooler: kW (BTUM)	630 (35,827)
Heat radiated to ambient: kW (BTUM)	225 (12,776)
Fan power: kW (hp)	87.5 (117.3)

Air requirements

Aspirating: *m ³ /min (SCFM)	225 (7,946)
Air flow required for radiator cooled unit: *m ³ /min (SCFM)	2,895 (102,247)
Remote cooled applications; air flow required for dissipation of radiated generator set heat for a maximum of 25 °F rise: *m ³ /min (SCFM)	816 (28,818)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Exhaust system

Gas temp. (stack): °C (°F)	455 (851)
Gas volume at stack temp: m ³ /min (CFM)	540 (19,070)
Maximum allowable back pressure at outlet of engine, before piping: kPa (in. H ₂ O)	8.5 (34.1)



MTU America Inc. 100 Power Drive, Mankato, MN 56001

To whom it may concern

Contact
Mark Holt

Tel. No.
612-518-6775

Ref.
Date
02 February 2021

Not to exceed emissions for Engines Series 20V4000G64S

Dear Sirs,

We hereby confirm that our engines Series 20V4000G64S, EPA Tier 2, Application Group Standby (3D), will have a NOx- Emission (Not to exceed- Value) of max. 6g / bhp-hr. in the power range from 681 kW_{mech.} to 2738 kW_{mech.}

Not to exceed- values:

Power	[kW]	2738	2051	1367	681
Power relative	[-]	1	0.75	0.5	0.25
Speed	[rpm]	1800	1800	1800	1800
NOx	[g/kWh]	<8.05	7.46	5.38	5.21
	[g/bhp]	<6.00	5.56	4.01	3.89
CO	[g/kWh]	1.96	1.62	1.00	2.81
	[g/bhp]	1.46	1.21	0.75	2.10
HC	[g/kWh]	0.21	0.23	0.44	1.51
	[g/bhp]	0.16	0.17	0.33	1.13
Particulate measured	[g/kWh]	0.155	0.193	0.101	0.366
	[g/bhp]	0.116	0.144	0.075	0.273

Emissions data measurement procedures are consistent with those described in the applicable rules and standards.

The NOx, CO, HC and PM emission data displayed here are valid for the following conditions:

- Ambient air pressure 1 bar
- Air intake temperature approx. 25°C
- Rel. Humidity 30%-95%
- New Engine
- New standard- air filter
- Exhaust gas back pressure according the given value in this EDS
- Fuel according to EN 590 or US EPA 40CFR89
- Coolant and Lubricants according MTU Fuels and Lubricants Specification

The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures, and instrumentation. Over time deterioration may occur which may have an impact on emission levels. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

MTU Friedrichshafen GmbH has made efforts to ensure that the information in this letter is accurate, but reserves the right to amend specifications and information without notice and without obligation or liability. No liability for any errors, facts or opinions is accepted. Customers must satisfy themselves as to the suitability of this product for their application. No responsibility for any loss as a result of any person placing reliance on any material contained in this data sheet will be accepted.

MTU Friedrichshafen GmbH reserves all rights in the information contained in this letter. It shall not be reproduced, made available to a third party or otherwise used in any way whatsoever.

For further details see the corresponding emission data sheet.

Yours sincerely,



Mark Holt
Emissions Specialist
MTU America Inc.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2021 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: MTU America, Inc.
(U.S. Manufacturer or Importer)
Certificate Number: MMDDL95.4GTZ-002

Effective Date:

12/07/2020

Expiration Date:

12/31/2021

Byron J. Bunker, Division Director
Compliance Division

Issue Date:

12/07/2020

Revision Date:

N/A

Model Year: 2021

Manufacturer Type: Original Engine Manufacturer

Engine Family: MMDDL95.4GTZ

Mobile/Stationary Indicator: Stationary

Emissions Power Category: 560<kW<=2237

Fuel Type: Diesel

After Treatment Devices: No After Treatment Devices Installed

Non-after Treatment Devices: Electronic Control, Smoke Puff Limiter

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

The actual engine power may lie outside the limits of the Emissions Power Category shown above. See the certificate application for details.

RECEIVED 7/8/2025

Cat® 3516C

Diesel Generator Sets



Image shown may not reflect actual configuration

Bore – mm (in)	170 (6.69)
Stroke – mm (in)	215 (8.46)
Displacement – L (in³)	78 (4764.73)
Compression Ratio	14.7:1
Aspiration	TA
Fuel System	EUI
Governor Type	ADEM™ A3

Standby 60 Hz ekW (kVA)	Mission Critical 60 Hz ekW (kVA)	Prime 60 Hz ekW (kVA)	Continuous 60 Hz ekW (kVA)	Emissions Performance
2500 (3125)	2500 (3125)	2250 (2812)	2050 (2562)	U.S. EPA Stationary Emergency Use Only (Tier 2)

Features

Cat® Diesel Engine

- Meets U.S. EPA Stationary Emergency Use Only (Tier 2) emission standards
- Reliable 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 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

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

3516C Diesel Generator Sets Electric Power



Standard and Optional Equipment

Engine

Air Cleaner

- ☐ Single element
- ☐ Dual element

Muffler

- ☐ Industrial grade (15 dB)

Starting

- ☐ Standard batteries
- ☐ Oversized batteries
- ☐ Standard electric starter(s)
- ☐ Heavy duty electric starter(s)
- ☐ Air starter(s)
- ☐ Jacket water heater

Alternator

Output voltage

- ☐ 380V ☐ 6300V
- ☐ 440V ☐ 6600V
- ☐ 480V ☐ 6900V
- ☐ 600V ☐ 12470V
- ☐ 2400V ☐ 13200V
- ☐ 4160V ☐ 13800V

Temperature Rise (over 40°C ambient)

- ☐ 150°C
- ☐ 125°C/130°C
- ☐ 105°C
- ☐ 80°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
- ☐ 1600A ☐ 2000A
- ☐ 2500A ☐ 3000A
- ☐ 3200A ☐ 4000A
- ☐ 5000A
- ☐ IEC ☐ UL
- ☐ 3-pole ☐ 4-pole
- ☐ Manually operated
- ☐ Electrically operated

Trip Unit

- ☐ LSI ☐ LSI-G
- ☐ LSI-G-P

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

Vibration Isolators

- ☐ Rubber
- ☐ Spring
- ☐ Seismic rated

Cat Connect

Connectivity

- ☐ Ethernet
- ☐ Cellular

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)
- ☐ 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.

3516C Diesel Generator Sets Electric Power



Package Performance

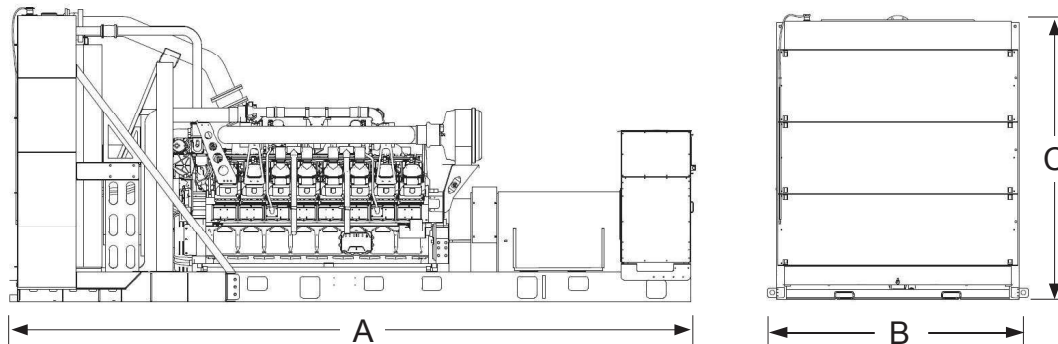
Performance	Standby		Mission Critical		Prime		Continuous	
Frequency	60 Hz		60 Hz		60 Hz		60 Hz	
Gen set power rating with fan	2500 ekW		2500 ekW		2250 ekW		2050 ekW	
Gen set power rating with fan @ 0.8 power factor	3125 kVA		3125 kVA		2812 kVA		2562 kVA	
Emissions	EPA ESE (TIER 2)		EPA ESE (TIER 2)		EPA ESE (TIER 2)		EPA ESE (TIER 2)	
Performance number	EM1894-01		EM1895-02		DM8447-04		DM8268-03	
Fuel Consumption								
100% load with fan – L/hr (gal/hr)	656.8	(175.3)	656.8	(175.3)	593.0	(156.6)	549.3	(145.1)
75% load with fan – L/hr (gal/hr)	510.8	(134.9)	510.8	(134.9)	467.8	(123.6)	435.6	(115.1)
50% load with fan – L/hr (gal/hr)	372.4	(98.4)	372.4	(98.4)	341.9	(90.3)	316.8	(83.7)
25% load with fan – L/hr (gal/hr)	219.3	(57.9)	219.3	(57.9)	203.0	(53.6)	188.9	(49.9)
Cooling System								
Radiator air flow restriction (system) – kPa (in. water)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)
Radiator air flow – m³/min (cfm)	2356	(83201)	2356	(83201)	2356	(83201)	2356	(83201)
Engine coolant capacity – L (gal)	233.0	(61.6)	233.0	(61.6)	233.0	(61.6)	233.0	(61.6)
Radiator coolant capacity – L (gal)	180.0	(47.6)	180.0	(47.6)	180.0	(47.6)	180.0	(47.6)
Total coolant capacity – L (gal)	413.0	(109.2)	413.0	(109.2)	413.0	(109.2)	413.0	(109.2)
Inlet Air								
Combustion air inlet flow rate – m³/min (cfm)	242.2	(7212.2)	242.2	(7212.2)	193.1	(6819.8)	183.8	(6491.7)
Exhaust System								
Exhaust stack gas temperature – °C (°F)	490.7	(915.2)	490.7	(915.2)	471.3	(880.4)	463.6	(866.5)
Exhaust gas flow rate – m³/min (cfm)	554.5	(19578.8)	554.5	(19578.8)	507.9	(17935.1)	476.5	(16826.7)
Exhaust system backpressure (maximum allowable) – kPa (in. water)	6.7	(27.0)	6.7	(27.0)	6.7	(27.0)	6.7	(27.0)
Heat Rejection								
Heat rejection to jacket water – kW (Btu/min)	826	(46992)	826	(46992)	777	(44160)	739	(42021)
Heat rejection to exhaust (total) – kW (Btu/min)	2502	(142265)	2502	(142265)	2243	(127532)	2092	(118949)
Heat rejection to aftercooler – kW (Btu/min)	786	(44723)	786	(44723)	690	(39224)	619	(35176)
Heat rejection to atmosphere from engine – kW (Btu/min)	161	(9146)	161	(9146)	150	(8542)	145	(8229)
Heat rejection from alternator – kW (Btu/min)	121	(6853)	121	(6853)	99	(5607)	94	(5368)
Emissions* (Nominal)								
NOx mg/Nm³ (g/hp-h)	2349.1	(5.32)	2349.1	(5.32)	2206.7	(4.95)	2038.1	(4.62)
CO mg/Nm³ (g/hp-h)	195.4	(0.42)	195.4	(0.42)	141.2	(0.30)	124.8	(0.27)
HC mg/Nm³ (g/hp-h)	42.1	(0.10)	42.1	(0.10)	44.4	(0.11)	49.2	(0.12)
PM mg/Nm³ (g/hp-h)	14.1	(0.04)	14.1	(0.04)	10.9	(0.03)	11.0	(0.03)
Emissions* (Potential Site Variation)								
NOx mg/Nm³ (g/hp-h)	2818.9	(6.38)	2818.9	(6.38)	2648.0	(5.94)	2445.8	(5.55)
CO mg/Nm³ (g/hp-h)	351.8	(0.76)	351.8	(0.76)	254.2	(0.55)	224.6	(0.49)
HC mg/Nm³ (g/hp-h)	55.9	(0.14)	55.9	(0.14)	59.1	(0.15)	65.5	(0.16)
PM mg/Nm³ (g/hp-h)	19.7	(0.05)	19.7	(0.05)	15.2	(0.04)	15.3	(0.04)

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

3516C Diesel Generator Sets Electric Power



Weights and Dimensions



Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
6800 (267.7)	2339 (92.1)	2997 (118.0)	17 590 (38,780)

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

Ratings Definitions

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.

Continuous

Output available with non-varying load for an unlimited time. Average power output is 70-100% of the continuous power rating. Typical peak demand is 100% of continuous rated kW for 100% of the operating hours.

Applicable Codes and Standards

AS 1359, CSA C22.2 No. 100-04, UL 142, UL 489, UL 869, UL 2200, 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

- 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.

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PERFORMANCE DATA [516DRU9]

MARCH 22, 2022

For Help Desk Phone Numbers [Click here](#)

Perf No: EM1894

Change Level: 05

General

Heat Rejection

Sound

Emissions

Regulatory

Altitude Derate

Cross Reference

Supplementary Data

Perf Param Ref

View PDF

SALES MODEL:	3516C	COMBUSTION:	DIRECT INJECTION
BRAND:	CAT	ENGINE SPEED (RPM):	1,800
MACHINE SALES MODEL:		HERTZ:	60
ENGINE POWER (BHP):	3,634	FAN POWER (HP):	130.1
GEN POWER WITH FAN (EKW):	2,500.0	ASPIRATION:	TA
COMPRESSION RATIO:	14.7	AFTERCOOLER TYPE:	ATAAC
RATING LEVEL:	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:	ADEM3	TURBO QUANTITY:	4
ELECTRONICS TYPE:	ADEM3	TURBOCHARGER MODEL:	GT6041BN-48T-1.10
CAMSHAFT TYPE:	STANDARD	CERTIFICATION YEAR:	2006
IGNITION TYPE:	CI	CRANKCASE BLOWBY RATE (FT3/HR):	3,619.4
INJECTOR TYPE:	EUI	FUEL RATE (RATED RPM) NO LOAD (GAL/HR):	16.0
FUEL INJECTOR:	3920221	PISTON SPD @ RATED ENG SPD (FT/MIN):	2,539.4
UNIT INJECTOR TIMING (IN):	64.34		
REF EXH STACK DIAMETER (IN):	12		
MAX OPERATING ALTITUDE (FT):	2,953		

INDUSTRY	SUB INDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET
OIL AND GAS	LAND PRODUCTION	PACKAGED GENSET

General Performance Data [Top](#)

Note(s)
THIS STANDBY RATING IS FOR A STANDBY ONLY ENGINE ARRANGEMENT. RERATING THE ENGINE TO A PRIME OR CONTINUOUS RATING IS NOT PERMITTED.
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.

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
2,500.0	100	3,633	336	0.334	0.328	171.3	168.0	0.486	0.477
2,250.0	90	3,283	303	0.335	0.329	155.1	152.1	0.489	0.480
2,000.0	80	2,935	271	0.339	0.333	140.4	137.7	0.498	0.489
1,875.0	75	2,760	255	0.342	0.336	133.2	130.7	0.504	0.494
1,750.0	70	2,586	239	0.346	0.339	126.0	123.6	0.511	0.501
1,500.0	60	2,237	207	0.354	0.347	111.5	109.4	0.527	0.517
1,250.0	50	1,889	174	0.365	0.358	97.1	95.2	0.551	0.540
1,000.0	40	1,547	143	0.373	0.366	81.4	79.8	0.577	0.566
750.0	30	1,203	111	0.385	0.378	65.3	64.1	0.618	0.606
625.0	25	1,029	95	0.394	0.386	57.2	56.1	0.649	0.637
500.0	20	854	79	0.403	0.396	48.6	47.6	0.689	0.676
250.0	10	497	46	0.441	0.433	30.9	30.3	0.877	0.860

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
2,500.0	100	3,633	78.1	121.9	1,235.7	67.6	853.1	85	466.7
2,250.0	90	3,283	71.3	119.4	1,190.0	61.3	824.5	78	443.1
2,000.0	80	2,935	64.3	116.9	1,158.9	55.3	810.7	70	417.8
1,875.0	75	2,760	60.7	115.8	1,145.6	52.3	804.8	66	404.7
1,750.0	70	2,586	57.1	114.7	1,133.3	49.3	798.9	63	391.3
1,500.0	60	2,237	49.5	112.7	1,112.4	43.2	787.1	55	363.6
1,250.0	50	1,889	41.3	111.0	1,091.8	36.8	775.1	46	334.7
1,000.0	40	1,547	31.4	109.4	1,061.5	29.3	770.6	36	297.5

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
750.0	30	1,203	21.7	107.9	1,010.3	22.1	752.8	25	249.8
625.0	25	1,029	17.2	107.2	968.3	18.7	731.8	21	223.4
500.0	20	854	12.7	106.4	902.0	15.5	695.6	16	197.2
250.0	10	497	4.8	104.1	700.7	9.8	562.6	7	152.3

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
2,500.0	100	3,633	7,133.1	18,497.4	31,696.1	32,910.2	6,927.7	6,289.9
2,250.0	90	3,283	6,756.8	17,036.6	29,886.4	30,985.9	6,522.8	5,944.9
2,000.0	80	2,935	6,350.9	15,740.8	28,028.8	29,019.5	6,092.1	5,568.4
1,875.0	75	2,760	6,132.5	15,125.9	27,059.2	27,998.2	5,881.4	5,382.5
1,750.0	70	2,586	5,902.5	14,507.6	26,056.9	26,945.9	5,667.5	5,192.6
1,500.0	60	2,237	5,408.9	13,196.0	23,934.4	24,726.5	5,204.1	4,777.6
1,250.0	50	1,889	4,844.0	11,701.1	21,447.3	22,136.3	4,659.1	4,284.7
1,000.0	40	1,547	4,122.0	9,918.3	18,264.4	18,842.5	3,963.7	3,647.8
750.0	30	1,203	3,423.6	8,121.4	15,177.8	15,642.9	3,293.2	3,036.5
625.0	25	1,029	3,105.0	7,237.8	13,766.9	14,173.7	2,986.8	2,759.5
500.0	20	854	2,791.1	6,276.7	12,375.6	12,721.7	2,671.3	2,475.8
250.0	10	497	2,236.2	4,428.4	9,910.4	10,129.4	2,129.9	1,997.8

Heat Rejection Data [Top](#)

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
2,500.0	100	3,633	46,992	9,146	142,265	70,115	19,835	44,723	154,077	372,403	396,702
2,250.0	90	3,283	44,242	8,557	127,929	62,041	17,960	39,380	139,243	337,204	359,207
2,000.0	80	2,935	41,477	8,162	116,879	56,282	16,262	34,167	124,444	305,311	325,233
1,875.0	75	2,760	40,076	8,007	111,588	53,551	15,425	31,612	117,053	289,608	308,505
1,750.0	70	2,586	38,657	7,874	106,293	50,817	14,588	29,085	109,651	273,881	291,752
1,500.0	60	2,237	35,755	7,684	95,729	45,311	12,915	24,201	94,874	242,485	258,307
1,250.0	50	1,889	32,626	7,527	85,184	39,388	11,245	19,401	80,109	211,118	224,893
1,000.0	40	1,547	29,235	7,262	72,693	33,148	9,427	13,873	65,583	176,995	188,544
750.0	30	1,203	25,476	6,784	59,425	26,293	7,565	8,706	51,005	142,037	151,305
625.0	25	1,029	23,394	6,435	52,542	22,520	6,621	6,496	43,653	124,317	132,429
500.0	20	854	21,006	5,995	44,739	18,221	5,624	4,534	36,223	105,594	112,484
250.0	10	497	15,737	5,026	27,795	8,787	3,578	1,916	21,071	67,181	71,564

Sound Data [Top](#)

Note(s)
SOUND PRESSURE DATA FOR THIS RATING CAN BE FOUND IN PERFORMANCE NUMBER - DM8779.

Emissions Data [Top](#)

Units Filter | All Units

DIESEL

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN	EKW	2,500.0	1,875.0	1,250.0	625.0	250.0
ENGINE POWER	BHP	3,633	2,760	1,889	1,029	497
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	19,123	11,751	5,837	2,974	2,654
TOTAL CO	G/HR	1,515	725	607	831	1,165
TOTAL HC	G/HR	376	375	408	307	329
TOTAL CO2	KG/HR	1,740	1,340	966	559	296
PART MATTER	G/HR	132.5	88.4	94.3	99.6	100.7
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,349.1	1,857.9	1,286.9	1,127.3	1,858.5
TOTAL CO	(CORR 5% O2) MG/NM3	195.4	118.8	140.1	330.3	862.6
TOTAL HC	(CORR 5% O2) MG/NM3	42.1	54.8	81.8	105.8	212.3
PART MATTER	(CORR 5% O2) MG/NM3	14.1	11.8	18.4	34.7	63.0
TOTAL NOX (AS NO2)	(CORR 15% O2) MG/NM3	871.7	689.4	477.5	418.3	689.6
TOTAL CO	(CORR 15% O2) MG/NM3	72.5	44.1	52.0	122.6	320.1
TOTAL HC	(CORR 15% O2) MG/NM3	15.6	20.3	30.4	39.3	78.8
PART MATTER	(CORR 15% O2) MG/NM3	5.2	4.4	6.8	12.9	23.4

GENSET POWER WITH FAN ENGINE POWER		EKW BHP	2,500.0 3,633	1,875.0 2,760	1,250.0 1,889	625.0 1,029	250.0 497
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,144	905	627	549	905
TOTAL CO	(CORR 5% O2)	PPM	156	95	112	264	690
TOTAL HC	(CORR 5% O2)	PPM	79	102	153	197	396
TOTAL NOX (AS NO2)	(CORR 15% O2)	PPM	425	336	233	204	336
TOTAL CO	(CORR 15% O2)	PPM	58	35	42	98	256
TOTAL HC	(CORR 15% O2)	PPM	29	38	57	73	147
TOTAL NOX (AS NO2)		G/HP-HR	5.32	4.30	3.12	2.92	5.39
TOTAL CO		G/HP-HR	0.42	0.26	0.32	0.82	2.37
TOTAL HC		G/HP-HR	0.10	0.14	0.22	0.30	0.67
PART MATTER		G/HP-HR	0.04	0.03	0.05	0.10	0.20
TOTAL NOX (AS NO2)		G/KW-HR	7.23	5.84	4.24	3.96	7.33
TOTAL CO		G/KW-HR	0.57	0.36	0.44	1.11	3.22
TOTAL HC		G/KW-HR	0.14	0.19	0.30	0.41	0.91
PART MATTER		G/KW-HR	0.05	0.04	0.07	0.13	0.28
TOTAL NOX (AS NO2)		LB/HR	42.16	25.91	12.87	6.56	5.85
TOTAL CO		LB/HR	3.34	1.60	1.34	1.83	2.57
TOTAL HC		LB/HR	0.83	0.83	0.90	0.68	0.72
TOTAL CO2		LB/HR	3,836	2,955	2,130	1,233	654
PART MATTER		LB/HR	0.29	0.19	0.21	0.22	0.22
OXYGEN IN EXH		%	9.4	10.4	11.3	12.2	14.4
DRY SMOKE OPACITY		%	1.7	1.4	1.9	2.6	4.0
BOSCH SMOKE NUMBER			0.83	0.80	0.85	0.97	1.13

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN ENGINE POWER		EKW BHP	2,500.0 3,633	1,875.0 2,760	1,250.0 1,889	625.0 1,029	250.0 497
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	22,948	14,101	7,004	3,568	3,185
TOTAL CO		G/HR	2,726	1,304	1,092	1,496	2,098
TOTAL HC		G/HR	500	499	543	408	437
PART MATTER		G/HR	185.5	123.7	132.1	139.5	141.0
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	2,818.9	2,229.5	1,544.3	1,352.7	2,230.2
TOTAL CO	(CORR 5% O2)	MG/NM3	351.8	213.9	252.3	594.6	1,552.7
TOTAL HC	(CORR 5% O2)	MG/NM3	55.9	72.8	108.8	140.7	282.4
PART MATTER	(CORR 5% O2)	MG/NM3	19.7	16.5	25.8	48.5	88.2
TOTAL NOX (AS NO2)	(CORR 15% O2)	MG/NM3	1,046.0	827.3	573.0	502.0	827.6
TOTAL CO	(CORR 15% O2)	MG/NM3	130.5	79.4	93.6	220.6	576.2
TOTAL HC	(CORR 15% O2)	MG/NM3	20.8	27.0	40.4	52.2	104.8
PART MATTER	(CORR 15% O2)	MG/NM3	7.3	6.1	9.6	18.0	32.7
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,373	1,086	752	659	1,086
TOTAL CO	(CORR 5% O2)	PPM	281	171	202	476	1,242
TOTAL HC	(CORR 5% O2)	PPM	104	136	203	263	527
TOTAL NOX (AS NO2)	(CORR 15% O2)	PPM	510	403	279	244	403
TOTAL CO	(CORR 15% O2)	PPM	104	63	75	177	461
TOTAL HC	(CORR 15% O2)	PPM	39	50	75	97	196
TOTAL NOX (AS NO2)		G/HP-HR	6.38	5.15	3.74	3.50	6.47
TOTAL CO		G/HP-HR	0.76	0.48	0.58	1.47	4.26
TOTAL HC		G/HP-HR	0.14	0.18	0.29	0.40	0.89
PART MATTER		G/HP-HR	0.05	0.05	0.07	0.14	0.29
TOTAL NOX (AS NO2)		G/KW-HR	8.67	7.01	5.09	4.76	8.79
TOTAL CO		G/KW-HR	1.03	0.65	0.79	2.00	5.79
TOTAL HC		G/KW-HR	0.19	0.25	0.39	0.54	1.21
PART MATTER		G/KW-HR	0.07	0.06	0.10	0.19	0.39
TOTAL NOX (AS NO2)		LB/HR	50.59	31.09	15.44	7.87	7.02
TOTAL CO		LB/HR	6.01	2.88	2.41	3.30	4.62
TOTAL HC		LB/HR	1.10	1.10	1.20	0.90	0.96
PART MATTER		LB/HR	0.41	0.27	0.29	0.31	0.31

Regulatory Information [Top](#)

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	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 6.4 PM: 0.20

Altitude Derate Data [Top](#)

STANDARD

ALTITUDE CORRECTED POWER CAPABILITY (BHP)											
AMBIENT OPERATING TEMP (F)	30	40	50	60	70	80	90	100	110	120	NORMAL
ALTITUDE (FT)											
0	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634
1,000	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,561	3,634
2,000	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,604	3,541	3,480	3,634
3,000	3,628	3,628	3,628	3,628	3,628	3,603	3,537	3,474	3,413	3,354	3,628

AMBIENT OPERATING TEMP (F)	30	40	50	60	70	80	90	100	110	120	NORMAL
4,000	3,504	3,504	3,504	3,504	3,504	3,471	3,408	3,347	3,289	3,232	3,504
5,000	3,384	3,384	3,384	3,384	3,384	3,344	3,283	3,225	3,168	3,113	3,384
6,000	3,269	3,269	3,269	3,269	3,269	3,221	3,162	3,105	3,051	2,998	3,269
7,000	3,159	3,159	3,159	3,159	3,159	3,101	3,044	2,990	2,937	2,887	3,159
8,000	3,052	3,052	3,052	3,052	3,041	2,985	2,930	2,878	2,827	2,779	3,052
9,000	2,950	2,950	2,950	2,950	2,926	2,872	2,820	2,769	2,721	2,674	2,950
10,000	2,851	2,851	2,851	2,851	2,815	2,763	2,713	2,664	2,617	2,544	2,851

Cross Reference [Top](#)

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
4577175	LL1857	5084280	GS336	-	SBK02000	
4581566	LL6759	5157721	PG243	-	LYM00001	

Supplementary Data [Top](#)

Type	Classification	Performance Number
SOUND	SOUND PRESSURE	DM8779

Performance Parameter Reference [Top](#)

Parameters Reference: DM9600 - 14 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% Fuel rate +/- 5% Specific DEF consumption +/- 3% DEF rate +/- 5% 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 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 controllable-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 : 10/27/21



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2022 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Caterpillar Inc.**
(U.S. Manufacturer or Importer)
Certificate Number: **NCPXL78.1NZS-011**

Effective Date:

06/14/2021

Expiration Date:

12/31/2022

Byron J. Bunker, Division Director
Compliance Division

Issue Date:

06/14/2021

Revision Date:

N/A

Model Year: 2022

Manufacturer Type: Original Engine Manufacturer

Engine Family: NCPXL78.1NZS

Mobile/Stationary Indicator: Stationary

Emissions Power Category: kW>560

Fuel Type: Diesel

After Treatment Devices: No After Treatment Devices Installed

Non-after Treatment Devices: Electronic Control, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

RECEIVED 7/8/2025

Application & Performance Warranty Data

Project Information

Site Location:	AZ
Project Name:	QTS 2H 2023
Application:	Standby Power
Number Of Engines:	45
Operating Hours per Year:	100

Engine Specifications

Engine Manufacturer:	Caterpillar
Model Number:	3516C
Rated Speed:	1800 RPM
Type of Fuel:	Ultra-Low Sulfur Diesel (ULSD)
Type of Lube Oil:	1 wt% sulfated ash or less
Lube Oil Consumption:	0.1 % Fuel Consumption
Number of Exhaust Manifolds:	2

Engine Cycle Data

Load	Speed	Power	Exhaust Flow	Exhaust Temp.	Fuel Cons.	NO _x	O ₂	H ₂ O
%		bhp	acfm (cfm)	° F	gal/hr	g/bhp-hr	%	%
100	Rated	3,633	18,497.4	853.1		5.32	10	12

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 *	5.32	2.13	492	908	7.134	15.73	0.5	0.2	46	85	0.671	1.48	90.6%



System Specifications

SCR System Specifications (NBZ-56-22100172, ACIS-3)

SCR Catalyst Space Velocity:	10,752 1/hr
Sound Target:	85 dBA @ 23 ft
Reactant:	Urea
Percent Concentration:	32.5%
Design Exhaust Flow Rate:	18,497 acfm (cfm)
Design Exhaust Temperature ¹ :	853° F
Exhaust Temperature Limits:	572° F – 977° F
SCR Catalyst Volume:	40 ft ³
System Dosing Capacity:	60 L/hr
System Pressure Loss:	10.0 inH ₂ O (Clean)
Total Catalyst Volume:	40 ft ³
Estimated Reactant Consumption:	11.1 gal/hr (42.0 L/hr) / Per Engine

Sound Data

	Octave Band Center Frequency (OBCF)											Receiver	
	Hz	31.5	63	125	250	500	1000	2000	4000	8000	dBA	Angle	Distance
Raw Engine Exhaust Sound Levels													
Sound Pressure	dB			124.0	120.0	112.0	110.0	112.0	111.0	110.0	119.1	90°	4.9 ft
Calculated Sound Power	dB			135.5	131.5	123.5	121.5	123.5	122.5	121.5	130.6		
Calculated Sound Pressure	dB			127.4	123.4	115.4	113.4	115.4	114.4	113.4	122.5	90°	3.3 ft
Requested Sound Target													
Overall Sound Pressure											85.0	90°	23 ft
Calculated Target Overall Sound Pressure											101.9	90°	3.3 ft
Sound Performance Estimations (NBZ-56-22100172)													
Estimated Sound Attenuation	dB	4.8	8.5	12.6	17.3	23.1	29.4	39.5	55.2	58.9	21.0		
Estimated Sound Power	dB			122.9	114.2	100.4	92.1	84.0	67.3	62.6	109.5		
Estimated Sound Pressure	dB			98.0	89.3	75.5	67.2	59.1	42.4	37.7	84.6	90°	23 ft
Estimated Sound Pressure	dB			114.8	106.1	92.3	84.0	75.9	59.2	54.5	101.5	90°	3.3 ft

- The stated values are based on the data given by the engine manufacturer (as referenced in table above) according to the unsilenced exhaust noise, exhaust gas flow, and temperature.
- The length of the exhaust piping before and after the silencer must be free of resonance in terms of the ignition frequency of the combustion engine.
- If the engine manufacturer sound data is missing any octave bands, it will affect the estimation calculation in the table above.
- Computed noise levels at each distance and frequency are based on a free field condition; site conditions have not been considered in acoustic predictions.
- For all distance noise propagation, free field dispersion rule of 6 dB is used every time distance is doubled.
- Product shall be installed in accordance with standard industry practices, local codes/standards, and manufacturer requirements.
- The acoustic performance shown is an estimate only; the performance is not guaranteed.



Special Notes & Conditions

1. For housings and exhaust components that are insulated, internally or externally, please refer to Section 7.1 of the General Terms and Conditions of Sale to prevent voiding MIRATECH product warranty. - Carbon steel is suitable for temperatures up to 900° F / 482° C continuously, when covered with external insulation or a heat shield. For continuous operation above 900° F / 482° C, where the equipment is externally insulated or has a heat shield, stainless steel should be used.
- A packed silencer installed upstream of the MIRATECH catalyst system will void MIRATECH's limited warranty.
 - No CO target was specified by you, our customer. We want to make sure you know there will be a slight CO increase across the SCR catalyst which needs to be taken into consideration, through your permit or by including a CO target. Oxidation catalyst will be required to maintain your current raw CO value. The oxidation catalyst is NOT included in this proposal.
 - Any sound attenuation or emissions reductions listed are based on housing with catalyst elements installed.
 - MIRATECH Coating System 7 is not suitable for use under external insulation.



APPENDIX E

ENVIRONMENTAL JUSTICE LETTER OF
CONCURRENCE AND SUMMARY



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

Environmental Justice Verification Number: 85952293

Ashley Kung

QTS Aurora LLC

QTS DEN1

Census Block Group 080050071051

March 28, 2025

Dear Ashley Kung,

We have reviewed the complete Environmental Justice Summary submitted on March 21, 2025 for the QTS DEN1 facility in census block group 080050071051. Based on this information, the facility is located in a Disproportionately Impacted Community that meets the definition of a Socioeconomically Vulnerable (SV) Community. The Air Pollution Control Division's Environmental Justice Summaries data use Colorado EnviroScreen 1.0, in accordance with the Air Quality Control Commission Regulation 3.

Some factors identified during the screening phase warranted further analysis by the Air Pollution Control Division, including the following indicators:

- People of color population (above 47% as an absolute metric and above the 78th percentile as a relative metric);
- Air toxics emissions (above the 97th percentile);
- Impaired streams and rivers (above the 93rd percentile);
- Other air pollutants (above the 94th percentile);
- Proximity to oil and gas (above the 91st percentile);
- Floodplains (above the 82nd percentile);





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- Asthma hospitalization rate (above the 83rd percentile); and
- Population under five years of age (above the 86th percentile).

These factors may be reviewed and considered further by the Air Pollution Control Division once you submit your complete permit application. Additional information on recommended community engagement strategies can be found in [the Statement of Basis and Purpose for Air Quality Regulation 3](#) (see p. 70 and p. 352).

We strongly encourage you to prioritize community engagement, outreach, and public participation. For valuable tips and best practices to implement the aforementioned recommendations, visit the [CDPHE website](#). Please provide documentation for any community engagement efforts as an attachment when you submit the permit application.

The Air Pollution Control Division advises you to contact the Community Air Protection and Engagement team to discuss specific community engagement efforts that the facility is highly recommended to conduct for this permit and community. Please email cdphe_apcd_ejreports@state.co.us to coordinate a community engagement consultation.

If outreach is still planned or ongoing after submitting the permit application, you can supplement the permit application with additional updates and documentation after that date. All information will become part of the permit record once submitted to the division as part of the full permit application, including any updates or documentation provided after the initial submission date.

Please include this full document as part of your permit application package. It includes the Environmental Justice Summary information you submitted, as well as





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this letter of concurrence. The Environmental Justice Summary is part of the permit record. If the main permit application does not include this letter of concurrence and the information attached, it may be rejected as incomplete.

Please note: Since this facility is located in a **Socioeconomically Vulnerable Community**, new community air monitoring fees may apply. Requirement applicability will be determined based on the permit application received. For more information, visit the division's [disproportionately impacted community permitting rule web page](#) and [Guidelines for Disproportionately Impacted Community Source-Specific Monitoring Requirements](#). If you have questions, email cdphe_apcd_dicmonitoring@state.co.us with "Air Monitoring Requirements" and the facility name in the subject line.

If you have any questions about the Environmental Justice Summary, please email cdphe_apcd_ejreports@state.co.us.

Thank you,

Air Pollution Control Division's Community Air Protection and Engagement Unit
Colorado Department of Public Health and Environment

For internal use only

Number of hours spent on Environmental Justice Summary review and approval: 0.5





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Section 1: Background Information (Company/Facility)

1. Company Name
QTS Aurora LLC
2. Facility Name
QTS DEN1
3. Facility Address
1160 N Gun Club Rd
Aurora, Colorado 80018
United States
4. Facility Latitude
39.73341
5. Facility Longitude
-104.7111
6. Census Block Group(s) in Which the Facility is Located
080050071051
7. Which Type of Air Permit Will You Be Applying For?
Construction Permit
8. What specific outcomes or changes will result from the requested permitting action? An increase in emissions
9. Has This Facility Previously Received an Official Permit or Exemption Letter from the Air Pollution Control Division (APCD)?
10. What is the AIRS ID of this facility?
005-1777
11. What is the permit number exemption number?

Section 2: Environmental Justice Requirements

1. Based on the Environmental Justice Report Generated, is this Facility Located in a Disproportionately Impacted (DI) Community?
Yes
2. What type of Disproportionately Impacted (DI) Community is the facility located in based on the Environmental Justice Report?
Socioeconomically Vulnerable (SV) Community



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Section 3: Description of Proposed Permit Application

1. Is the facility an Affected Construction Source?
Yes
2. Will this facility emit any Affected Pollutants?
Volatile organic compounds (VOCs); Nitrogen oxides (NO_x); Particulate matter ≤2.5 microns in diameter (PM_{2.5}); Benzene; Toluene; Xylene
3. Provide a brief description of the proposed permit application.
QTS is proposing to install and operate an additional 98 emergency generators (ENG041-ENG138) equipped with SCR control technology at the QTS DEN1 data center for a total of 138 emergency generators at the facility.
4. Based on the results of the facility's Environmental Justice Report results and/or engagement with the Disproportionately Impacted Community, describe any:
 - a. Mitigation measures;
 - b. Emission reduction and control strategies; QTS plans to equip the proposed emergency generators (ENG041-ENG138) with SCR control technology.
and/or
 - c. Changes made to the originally planned source equipment or operations.

Section 4: Public Outreach

1. Did the owner/operator of the facility conduct enhanced community outreach to the impacted community prior to submitting the main permit application?
No
 - a. If the option "Planned, in progress, or to be determined" is chosen: describe any measures that are planned, in progress, or to be determined.





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Part 1: Know the audience, community, and purpose

1. Did you contact residents within at least one-mile radius of the facility to notify them about the proposed permit or project and how they can provide feedback?
2. Did you contact and/or coordinate with any of the following types of organizations or individuals to understand local audiences and the most effective ways to reach them? (Select all that apply.)
3. (Optional) Provide any additional information about the audience, community, and purpose. Also provide the name of any organizations contacted:

Part 2: Host public meetings at various times and days

1. Meeting date:
2. Meeting time:
3. Meeting type: (Select all that apply.)
4. Meeting location(s) (venue name, street address and/or coordinates):
5. Number of registered participants:
6. Number of public participants and community members in attendance:

Part 3: Host public meeting(s) in locations that are safe and accessible

1. If the facility hosted in-person or hybrid meetings, did you choose locations that were: (Select all that apply)





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2. Location accessibility- the location was accessible by: (Select all that apply.)
3. Did you publish meeting and presentation materials on a publicly accessible website?
 - a. If yes, please add a link to the website.
4. Did you use a facilitator to keep the meeting on track?
5. (Optional) Provide any additional information about hosting considerations:

Part 4: Provide at least 30 days' notice ahead of public meetings

1. Did you provide at least 30 days' notice ahead of public meetings?
2. Did you provide at least one reminder in advance of the meeting?

Part 5: Actively promote outreach and public participation opportunities

1. Communication tactics used for promoting meetings: (Select all that apply.)
2. Were any of the communication tactics provided in multiple languages?
3. If you selected "yes" to the previous question, please list the languages used in communication tactics and why they were chosen:
4. Did you attend community events or collaborate with trusted partners and organizations to share updates, messages, and public meeting information?
5. (Optional) Provide any additional information about outreach and activities:





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Part 6: Ensure language justice, cultural competency, and accessibility in outreach materials

1. Were meetings made available in multiple languages (interpretation services provided for non-English speakers?)
2. Were meeting materials translated into multiple languages?
3. If interpreters were used, please note the vendor who provided the interpretation:
4. If translation was used, please note the vendor who provided the translation:
5. Were [digital accessibility best practices](#) used for web content, digital fliers, social media posts, or other digital communications?
6. (Optional) Provide any additional information about accessibility considerations:

Part 7: Provide various and accessible methods for receiving public feedback

1. Which of the following opportunities and platforms were provided for the public to provide feedback? (Select all that apply).
2. Number of public feedback comments received in writing:
3. Number of public feedback comments received verbally:
4. How did you review public feedback received and use it to inform the proposed project?
5. (Optional) Provide any additional information about public comments received and considered:





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Part 8: Reduce barriers to participation via participation stipends, childcare services, and more

1. Provided for public meeting attendees: (Select all that apply).
2. Included in the public meeting: (Select all that apply).
3. (Optional) Provide a short description of the activities conducted, methods used, and any additional information about reducing barriers for the community:





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Air Quality Regulation (Reg.) 3

Environmental Justice Report

Applicant Information

Company Name: QTS Aurora, LLC

Facility Name: QTS DEN1

Plant AIRS ID Number: 005-1777

Permit Type:

Permit Number: 22AR0210

Facility location used for generating the report: 39.73341, -104.7111

Environmental Justice Summary

Arapahoe County

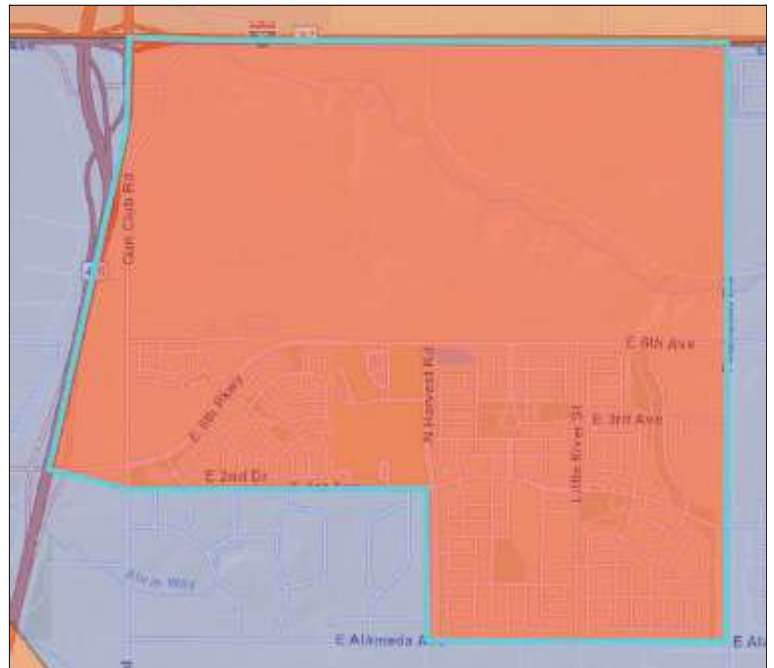
Census Block Group 080050071051

Air Quality Reg. 3 Disproportionately Impacted (DI) Community

Yes

Air Quality Reg. 3 Community Type

Socioeconomically Vulnerable Community



Low-income Population	8.3%
People of Color Population	47.9%
Limited English Proficiency Population	2.4%
Housing Cost Burdened Population	32.2%
CO EnviroScreen Percentile Score	58.38

Environmental Justice Overview

Environmental Exposures Percentile Score 48.64

The environmental exposures score represents a community's exposure to certain environmental risks relative to the rest of the state. The score ranges from 0 to 100, with higher scores indicating higher burden. The environmental exposures score does not cover all pollutants; it is the average of data on diesel particulate matter, traffic proximity, ozone, PM 2.5, air toxics, other air pollutants, lead exposure risk, drinking water violations, and noise.

Environmental Effects Percentile Score 76.16

The environmental effects score represents how many hazardous or toxic sites are in a community relative to the rest of the state. The score ranges from 0 to 100, with a higher score indicating higher burden. The score is the average of data on proximity to mining, oil and gas operations, impaired surface waters, wastewater discharge facilities, Superfund sites, facilities that use hazardous chemicals, and facilities that generate, treat, store, or dispose of hazardous wastes.

Climate Vulnerability Percentile Score 28.82

The climate burden score represents a community's risk of drought, flood, extreme heat, and wildfire compared to the rest of the state. The score ranges from 0 to 100, the higher the score, the higher the burden.

Sensitive Populations Percentile Score 63.42

The sensitive populations score captures how at risk a community is to environmental exposures and climate impacts as it relates to health. For example, air pollution has stronger impacts on older and younger people, and people with chronic conditions such as asthma. The score ranges from 0 to 100, with a higher score being worse. The score is calculated using data on asthma hospitalization rate, cancer prevalence, diabetes prevalence, heart disease prevalence, life expectancy, low birth weight rate, mental health, population over 65, and population under 5.

Demographics Percentile Score 45.02

The demographics score represents a community's social and economic vulnerabilities. The score ranges from 0 to 100, with a higher number representing a higher vulnerability. It is calculated using data on people living with disabilities, housing cost burden, educational attainment, limited English proficiency, income, and race and ethnicity.



Image above notes a one-mile radius from the location in the center of the circle.

One-mile radius around location used to generate report

An aerial or satellite image of the facility, including a one-mile radius of the surrounding area, is a required component for the Environmental Justice Summary.

This image was generated from the Environmental Justice Report Tool for Air Quality Regulation 3 using the ESRI World imagery basemap. The map features Maxar imagery at 0.3m resolution for select metropolitan areas around the world and 0.5m resolution across the United States. In addition to commercial sources, the World Imagery map features high-resolution aerial photography contributed by the GIS User Community. This imagery ranges from 0.3m to 0.03m resolution (down to ~1:280 in select communities).

For more information, visit: [World Imagery](#)

Pollution and Climate Indicators

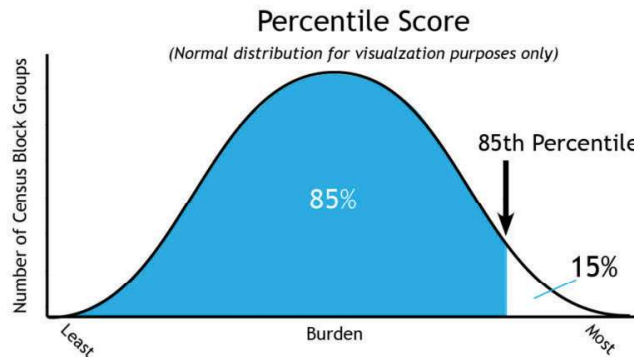
Indicator	Original Unit of Measure	Percentile
Air Toxics Emissions	distance weighted measure of estimated air toxics emissions	97.51
Diesel Particulate Matter	micrograms per cubic meter	32.17
Drinking Water Regulations	population weighted duration (in weeks) of resolved and unresolved health based violations from active community public water systems	68.94
Fine Particle Pollution (PM 2.5)	micrograms per cubic meter	63.48
Impaired Streams and Rivers	average impairment and assessment status of streams	93.06
Lead Exposure Risk	percentage of housing units built before 1960, as an indicator of potential exposure to lead	22.2
Noise	decibels A	33.61
Other Air Pollutants	distance weighted measure of estimated other air pollutant emissions	94.03
Ozone	parts per billion	46.91
Proximity to Hazardous Waste Facilities	distance weighted count of hazardous waste facilities within 5 km	72.28
Proximity to Mining Locations	distance weighted measure of the total number of active coal, hard rock, and construction materials mining permits	83.46
Proximity to National Priorities List Sites	distance weighted count of proposed or listed NPL sites with 5 km	71.04
Proximity to Oil and Gas	distance weighted measure of the total number of active oil and gas locations	91.02
Proximity to Risk Management Plan Sites	distance weighted count of RMP facilities within 5 km	49.38
Traffic Proximity and Volume	amount of vehicular traffic nearby, and distance from roads	23.77
Wastewater Discharge Indicator	toxic chemical concentrations in stream segments per km	34.4
Drought	sum of weekly total percent of an area experiencing a severe, extreme, or exceptional drought	13.59
Extreme Heat Days	average number of high heat days between May and September from 2016 to 2020	50.54
Floodplains	percentage of each geographic area where there is at least a one percent chance of flooding annually	82.76
Wildfire Risk	mean wildfire hazard potential within each geographic area as determined by the US Forest Service, 2021	65.23

Health and Social Indicators

Indicator	Original Unit of Measure	Percentile
Asthma Hospitalization Rate	rate of hospitalization per 100,000 people	83.16
Cancer Prevalence	percent of adults	30.1
Diabetes Prevalence	percent of adults	66.21
Heart Disease in Adults	percent of adults	32.44
Life Expectancy	years	41.5
Low Birth Weight	percent of singleton births	59.73
Mental Health Indicator	percent of adults	41.59
Population over 64 years of age	percent of total population	21.6
Population under 5 years of age	percent of total population	86.55
Disability	percent of total population	29.34
Housing Cost Burdened	percent of total population	57.64
Less Than High School Education	percent of total population	39.38
Linguistic Isolation	percent of total population	69.46
Low Income	percent of total population	15.41
People of Color	percent of total population	78.54

Understanding the Data

The values shown in the Pollution and Climate Indicator and Health and Social Indicator tables are percentiles. Percentiles are a way to see how one area compares to other areas in Colorado. Percentile values range from 0 - 100. A higher score indicates higher burden. Specifically, the percentile tells you the percentage of places in Colorado that have a lower score than the selected location. For example, an area with 85 percentile score for the noise indicator, ranks in the top 15% of areas impacted by noise in Colorado. That means that 85% of the other Census Block Groups in Colorado have a lower score for noise impacts.



The data in the report comes from Colorado EnviroScreen version 1.0. Developed in 2022 by CDPHE and Colorado State University, EnviroScreen maps the overlap of environmental exposures and effects, climate vulnerability, sensitive populations, and demographics to better understand environmental injustice and environmental health risks in Colorado. For more detailed information on the data sources used in Colorado EnviroScreen Version 1.0 see the [technical documentation](#).

On the first page of the report, red text highlights if values for a census block group meet or exceed the criteria for definition of Disproportionately Impacted Community for Air Quality Regulation 3. On subsequent pages of the report, red text highlights indicators in the top percentiles for Colorado that may warrant additional consideration during the permitting process. The Environmental Justice Report is not intended to show individual health risk or exposure.

In the Environmental Justice Summary on the first page, values shown in red indicate a census block group that meets or exceeds the following criteria to qualify as a Disproportionately Impacted (DI) Community for Air Quality Reg 3:

- Over 40% of households are low-income (meaning they are at or below 200% of the federal poverty level),
- Over 40% of the population identify as people of color,
- Over 50% of households are housing-cost burdened (meaning they spend more than 30% of household income on housing costs), or
- Over 20% of the population is linguistically isolated (meaning no adults in a household speak English well).

A census block group that meets or exceeds any of these percentages is labeled as a Socioeconomically Vulnerable Community (SVC).

The CO EnviroScreen Percentile Score, which is also found on the first page of the Environmental Justice Report, is written in red if it is above the 80th percentile. A census block group with a CO EnviroScreen Score above the 80th percentile is labeled as a Cumulatively Impacted Community (CIC).

In other sections of the Environmental Justice Report, including the Environmental Justice Overview, Pollution and Climate Indicators, and Health and Social Indicators sections, indicator and component scores over the 80th percentile

are also highlighted in red. The 80th percentile threshold is used in most cases to flag census block groups that have indicators and groups of indicators (components) that are in the top 20% of census block groups in Colorado. These indicators and components are flagged because they may warrant further review in the permitting process by the permit applicant and/or the Division staff reviewing the permit.

For most indicators, the indicator is highlighted in red if it is above the 80th percentile to indicate that the census block group where the facility is located faces higher risks based on that indicator compared to other Colorado communities. However, less than 20% of census block groups in Colorado have oil and gas facilities or mining locations. Accordingly, all census block groups in Colorado score above the 80th percentile for proximity to these two types of facilities because even having zero facilities puts a community in the top 20%. Accordingly, the Environmental Justice Report highlights a census block group in red if it is above the 85th percentile for mining facilities and above the 90th percentile for oil and gas facilities. This ensures that only census block groups with a greater number of facilities than the statewide average of zero are highlighted on the EJ Report.

Colorado EnviroScreen does:

- Show which areas in Colorado are more likely to have higher environmental health injustices.
- Identify areas in Colorado where government agencies can prioritize resources and work to reduce pollution and other sources of environmental injustice.
- Provide information to empower communities to advocate to improve public health and the environment.
- Identify areas that meet the updated definition of “Disproportionately Impacted Community” under House Bill 23-1233 adopted a definition that applies to all state agencies, including CDPHE.
- Identify areas where the Air Quality Regulation (Reg.) Number 3, which governs permitting in disproportionately impacted communities, applies.
- Identify areas that meet the prior definition of “Disproportionately Impacted Community” under the Colorado Environmental Justice Act (HB21-1266).

Colorado EnviroScreen does not:

- Define a healthy or unhealthy environment.
- Establish causal associations between environmental risks and health.
- Define all areas that may be affected by environmental injustice or specific environmental risks.
- Provide information about an individual person’s health status or environment.
- Take all environmental exposures into account.
- Tell us about smaller areas within a census block group that may be more vulnerable to environmental exposures than other areas.
- Provide information about non-human health or ecosystem risks.

Additional Resources

[Frequently Asked Questions: Environmental Justice Report Tool for Air Quality Regulation 3](#)

[Air Pollution Control Division’s Small Business Assistance Program](#)

[CDPHE Environmental Justice Program](#)

[Colorado EnviroScreen Version 1.0 Reports, Guides, and Resources Folder](#)



APPENDIX F MODELING REVIEW REPORT



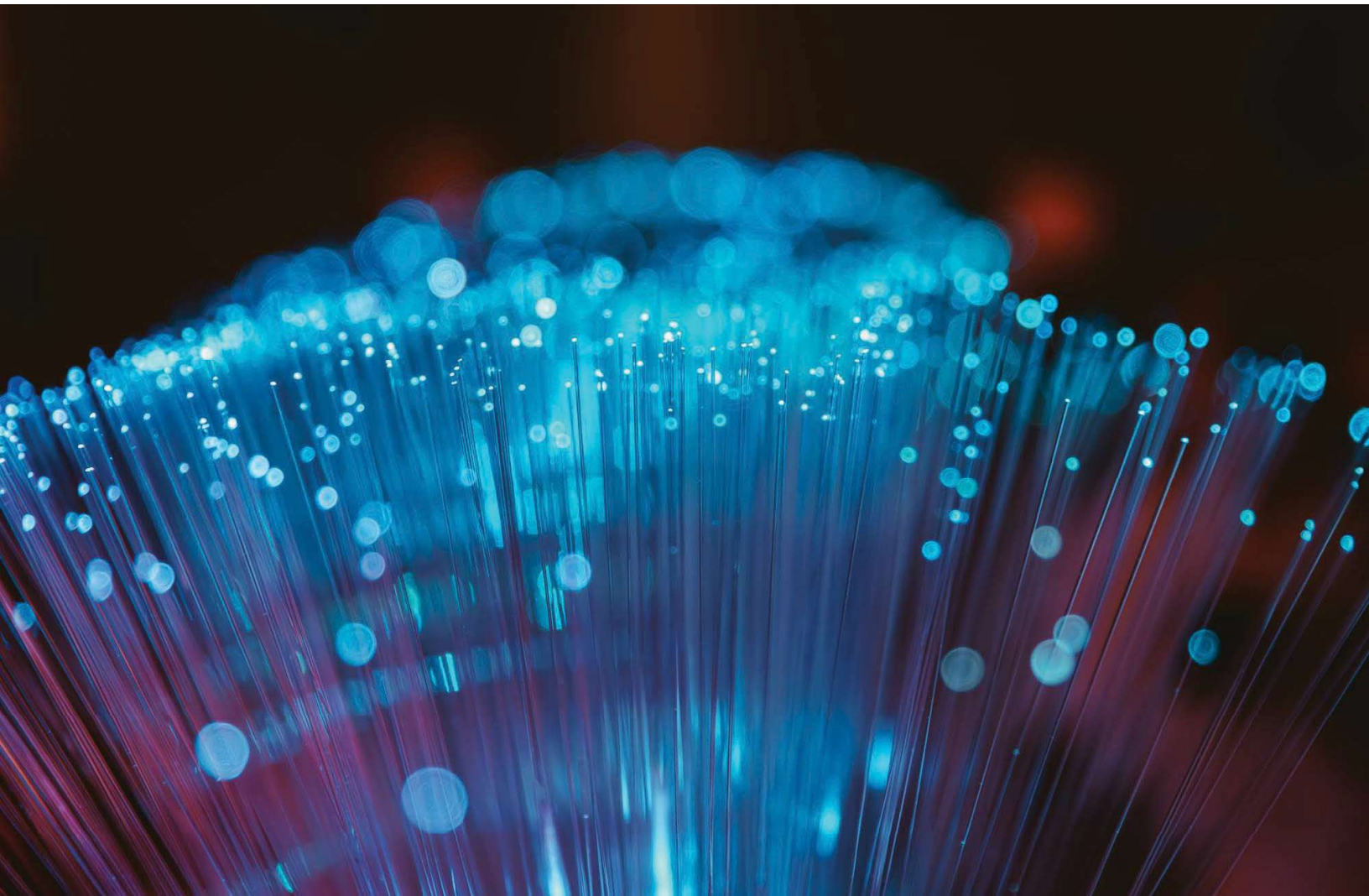
Air Dispersion Modeling Report

DEN1 DC1-3, Colorado

PREPARED FOR
QTS Aurora, LLC

DATE
30 May 2025

REFERENCE
0606578



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1. INTRODUCTION

On behalf of QTS Aurora, LLC (QTS), Environmental Resources Management, Inc. (ERM) submits this air quality modeling report for the Construction Permit Application submitted in June 2025.

This modeling report discusses the air dispersion modeling methodology that was followed to assess the impact of emissions of regulated air pollutants released by emission sources associated with the proposed Construction Permit Application. The goal of the analysis is to estimate source impacts on ambient air and determine if the proposed project complies with applicable Federal National Ambient Air Quality Standards (NAAQS) and Colorado Ambient Air Quality Standards (CAAQS). The modeling was conducted in accordance with Colorado Department of Public Health & Environment's (CDPHE) Colorado Minor NSR Source Modeling Guideline for Air Quality Permits.¹

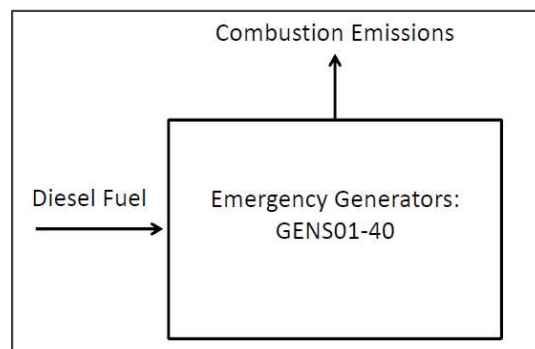
1.1 FACILITY AND PROJECT OVERVIEW

QTS is currently permitted to construct and operate 40 diesel-fired emergency generators (ENG001 – ENG040) at its data center located at 1160 N Gun Club Rd, Aurora, CO 80018 ("DEN1", "the facility") under current Permit Number 22AR0210 (Permit). ENG001 – ENG040 are permitted for three generator make and model options: (Kohler, MTU or CAT).

With this Construction Permit Application, QTS is proposing to install 98 additional diesel-fired emergency generators (ENG041 – ENG138) at two additional data center (DC) buildings at the site (49 generators at each new building). QTS proposes to permit two generator options for ENG041 – ENG138: HOLT Caterpillar (CAT) 3516C or YANCEY CAT 3516C, rated at 2,500 kilowatt-electrical (kWe). Therefore, QTS has completed a modeling analysis to demonstrate that operation of all 138 engines at the facility (ENG001 – ENG138), using any combination of generator options, will comply with the NAAQS.

In the Emergency Engine "process", diesel fuel-fired compression-ignition internal combustion engines are used to provide motive power to an integrated electrical generator; the power from the electricity to the load bank of the data center during periods of service interruption from the external power supply grid. A process flow diagram for the facility is shown in Figure 1-1.

FIGURE 1-1 – PROCESS FLOW DIAGRAM



¹ Colorado Department of Public Health & Environment, Air Pollution Control Division. Colorado Minor NSR Source Modeling Guideline for Air Quality Permits. March 1, 2025. Available at: <https://oitco.hylandcloud.com/cdphepop/docpop/docpop.aspx?clienttype=activex&docid=32457048>

Figure 1-2 shows a general area map with the location of the facility. Figure 1-3 shows a map with source locations and buildings. Appendix A includes 1:24,000-scale topographic maps of the facility site. The facility is located in the Denver metro/north Front Range area, which is classified as nonattainment under the 2008 and 2015 ozone standards.

FIGURE 1-2 – LOCATION OF FACILITY

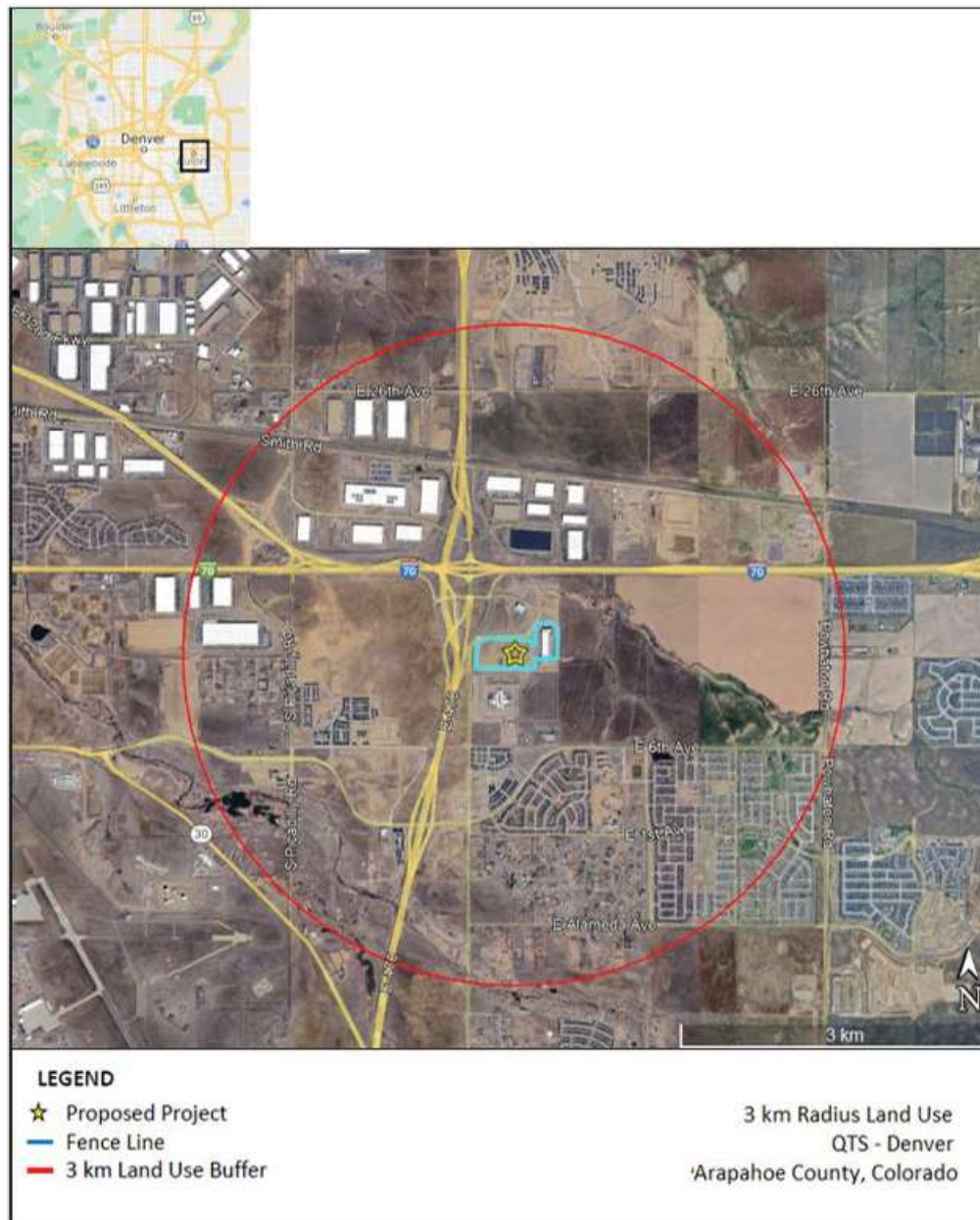
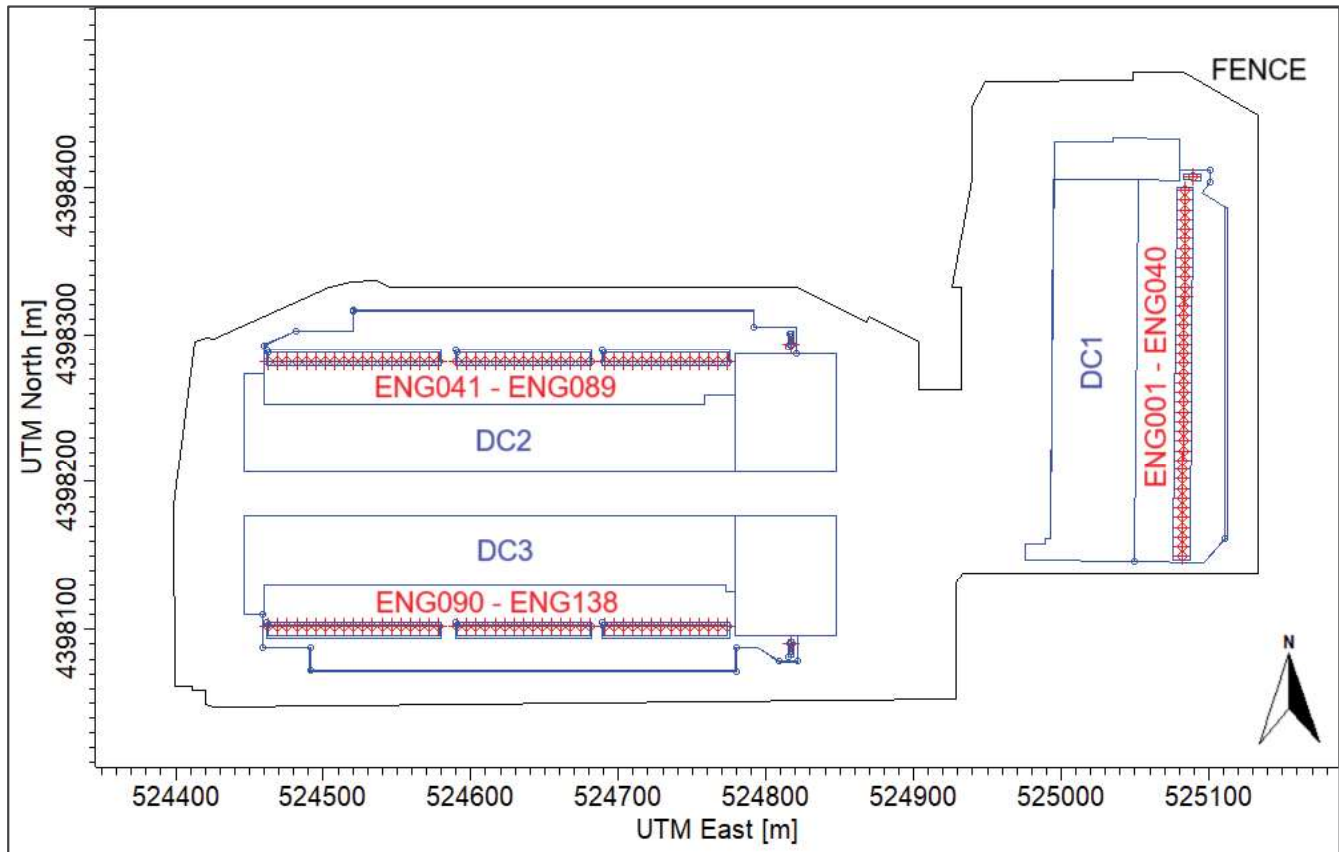


FIGURE 1-3 – PROJECT SITE PLOT PLAN



2. MODELING METHODOLOGY

QTS followed the same modeling approach used previously for ENG001-ENG040 at DC1 to demonstrate that the proposed project will comply with the applicable NAAQS. To ensure that the expanded site, including DC2 and DC3, would comply with the NAAQS, the modeling was updated to include all 138 generators across the facility. The modeling addresses the following pollutants:

- 1-hour and annual NO_2
- 1- and 3-hour SO_2
- 1- and 8-hour CO
- 24-hour PM_{10}
- 24-hour and annual $\text{PM}_{2.5}$

Table 2-1 shows the NAAQS thresholds that are applicable to the project. This report provides a summary of the modeling methodology and approach followed as well as a summary of the modeling results.

TABLE 2-1 – NAAQS THRESHOLDS APPLICABLE TO THE PROJECT

Pollutant	Averaging Period	NAAQS ($\mu\text{g}/\text{m}^3$)
NO₂	1-hour	188
	Annual	100
SO₂	1-hour	196
	3-hour	1300
CO	1-hour	40000
	8-hour	10000
PM₁₀	24-hour	150
PM_{2.5}	24-hour	35
	Annual	9

2.1 MODEL SELECTION AND APPLICATION

The dispersion modeling was conducted using version 24142 of U.S. EPA's American Meteorological Society/ Environmental Protection Agency Regulatory Model (AERMOD). AERMOD is recommended by the USEPA's Appendix W Guidance for determining near-field impacts (impacts within a 50 km radius of the facility) and is approved for regulatory determinations. All model assessments were performed using the regulatory default options in the rural mode.

2.2 COORDINATE SYSTEM

The locations of emission sources, structures, and receptors were represented in the Universal Transverse Mercator (UTM) coordinate system, Zone 13, North American Datum of 1983 (NAD83). The facility is located at approximately 525,750 meters (m) east and 4,398,200 m north in Zone 13, NAD83.

2.3 SOURCES

The proposed project consists of 138 2,500 kW emergency generators vented to the atmosphere through stacks and represented as point sources in the model. ENG001-ENG040 are currently permitted to operate between 7am and 7pm local time, with a maximum of 24 hours per year for each generator for non-emergency use. For this permit application, QTS is requesting to limit non-emergency operation for all emergency generators (ENG001-ENG138) to between 7am and 7pm local time, with a maximum of 36 hours per year for each generator for non-emergency use.

For short-term NAAQS, the worst-case hourly emission rates for each of the four load scenarios (25%, 50%, 75%, 100%) were modeled. For the annual NAAQS, annualized emission rates were modeled assuming maximum operation of 36 hours per year. The emissions were limited to between 7am and 7pm local time in AERMOD using the EMISFACT keyword along with the HROFDY option to set hours 1-7 and hours 20-24 to a factor of zero and hours 8-19 to a factor of 1 (one). Table 2-2, Table 2-3, and Table 2-4 list the source parameters, emission rates, and

locations, respectively, of the engines. Terrain elevations for all sources at the facility were assigned using estimates from Google Earth imagery.

TABLE 2-2 – POINT SOURCE RELEASE PARAMETERS

Part Load	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Diameter (m)
DC1 - MTU Engines					
100%	1689	5.91	728.15	36.7	0.56
75%	1689	5.91	729.26	29.8	0.56
50%	1689	5.91	705.37	24.1	0.56
25%	1689	5.91	645.93	16.3	0.56
DC1 - Kohler Engines					
100%	1689	5.85	729.15	42.5	0.51
75%	1689	5.85	737.15	43.9	0.51
50%	1689	5.85	720.15	29.8	0.51
25%	1689	5.85	737.15	17.6	0.51
DC1 - CAT Engines					
100%	1689	6.49	729.32	53.2	0.46
75%	1689	6.49	702.48	43.5	0.46
50%	1689	6.49	685.98	33.6	0.46
25%	1689	6.49	661.93	20.8	0.46
DC2/DC3 - Controlled Holt CAT Engines					
100%	1689	7.02	729.32	19.1	0.76
75%	1689	7.02	702.48	15.7	0.76
50%	1689	7.02	685.98	12.1	0.76
25%	1689	7.02	661.93	7.5	0.76
DC2/DC3 - Controlled Yancey CAT Engines					
100%	1689	7.17	729.32	19.1	0.76
75%	1689	7.17	702.48	15.7	0.76
50%	1689	7.17	685.98	12.1	0.76
25%	1689	7.17	661.93	7.5	0.76

TABLE 2-3 – POINT SOURCE EMISSION RATES

Part Load	Emission Rates (grams per second)						
	NO ₂ 1-hour	NO ₂ Annual	PM _{2.5} 24-hour	PM _{2.5} Annual	PM ₁₀ 24-hour	CO 1-hour, 8-hour	SO ₂ 1-hour, 3-hour
DC1 - MTU Engines							
100%	6.122	0.0252	0.094	0.00039	0.097	1.491	0.0056
75%	4.250	0.0175	0.088	0.00036	0.090	0.923	0.0042
50%	2.043	0.0084	0.031	0.00013	0.032	0.380	0.0028
25%	0.986	0.0041	0.055	0.00023	0.057	0.532	0.0014
DC1 - Kohler Engines							
100%	8.400	0.0345	0.060	0.00025	0.062	0.750	0.0055
75%	2.981	0.0123	0.090	0.00037	0.092	1.969	0.0042
50%	2.138	0.0088	0.045	0.00018	0.046	0.713	0.0028
25%	1.106	0.0045	0.060	0.00025	0.062	1.388	0.0014
DC1 - Uncontrolled CAT Engines							
100%	6.526	0.0268	0.042	0.00017	0.043	0.775	0.0056
75%	4.008	0.0165	0.027	0.00011	0.028	0.372	0.0042
50%	1.992	0.0082	0.031	0.00013	0.032	0.309	0.0029
25%	1.015	0.0042	0.032	0.00013	0.033	0.426	0.0016
DC2/DC3 - Controlled CAT Engines							
100%	1.842	0.0076	0.042	0.00017	0.043	0.775	0.0056
75%	1.478	0.0061	0.027	0.00011	0.028	0.372	0.0042
50%	1.069	0.0044	0.031	0.00013	0.032	0.309	0.0029
25%	1.015	0.0042	0.032	0.00013	0.033	0.426	0.0016

TABLE 2-4 – POINT SOURCE COORDINATES

Source	UTM Easting (X) (m)	UTM Northing (Y) (m)	Base Elevation (m)
ENG001	525,084.00	4,398,397.71	1689
ENG002	525,083.94	4,398,391.18	1689
ENG003	525,083.89	4,398,384.66	1689
ENG004	525,083.83	4,398,378.13	1689
ENG005	525,083.77	4,398,371.60	1689
ENG006	525,083.72	4,398,365.07	1689
ENG007	525,083.66	4,398,358.55	1689
ENG008	525,083.60	4,398,352.02	1689
ENG009	525,083.55	4,398,345.49	1689
ENG010	525,083.49	4,398,338.97	1689
ENG011	525,083.43	4,398,332.44	1689
ENG012	525,083.38	4,398,325.91	1689
ENG013	525,083.32	4,398,319.39	1689
ENG014	525,083.27	4,398,312.86	1689

Source	UTM Easting (X) (m)	UTM Northing (Y) (m)	Base Elevation (m)
ENG015	525,083.21	4,398,306.33	1689
ENG016	525,083.15	4,398,299.80	1689
ENG017	525,083.10	4,398,293.28	1689
ENG018	525,083.04	4,398,286.75	1689
ENG019	525,082.98	4,398,280.22	1689
ENG020	525,082.93	4,398,273.70	1689
ENG021	525,082.87	4,398,267.17	1689
ENG022	525,082.81	4,398,260.64	1689
ENG023	525,082.76	4,398,254.11	1689
ENG024	525,082.70	4,398,247.59	1689
ENG025	525,082.64	4,398,241.06	1689
ENG026	525,082.59	4,398,234.53	1689
ENG027	525,082.53	4,398,228.01	1689
ENG028	525,082.47	4,398,221.48	1689
ENG029	525,082.42	4,398,214.95	1689
ENG030	525,082.36	4,398,208.42	1689
ENG031	525,082.30	4,398,201.90	1689
ENG032	525,082.25	4,398,195.37	1689
ENG033	525,082.19	4,398,188.84	1689
ENG034	525,082.13	4,398,182.32	1689
ENG035	525,082.08	4,398,175.79	1689
ENG036	525,082.02	4,398,169.26	1689
ENG037	525,081.96	4,398,162.73	1689
ENG038	525,081.91	4,398,156.21	1689
ENG039	525,081.85	4,398,149.68	1689
ENG040	525,088.98	4,398,406.91	1689
ENG041	524,462.79	4,398,281.50	1689
ENG042	524,469.20	4,398,281.50	1689
ENG043	524,475.61	4,398,281.50	1689
ENG044	524,482.03	4,398,281.50	1689
ENG045	524,488.44	4,398,281.50	1689
ENG046	524,494.85	4,398,281.50	1689
ENG047	524,501.26	4,398,281.50	1689
ENG048	524,507.67	4,398,281.50	1689
ENG049	524,514.08	4,398,281.50	1689
ENG050	524,520.50	4,398,281.50	1689
ENG051	524,526.91	4,398,281.50	1689
ENG052	524,533.32	4,398,281.50	1689
ENG053	524,539.73	4,398,281.50	1689
ENG054	524,546.14	4,398,281.50	1689
ENG055	524,552.55	4,398,281.50	1689
ENG056	524,558.96	4,398,281.50	1689
ENG057	524,565.38	4,398,281.50	1689

Source	UTM Easting (X) (m)	UTM Northing (Y) (m)	Base Elevation (m)
ENG058	524,571.79	4,398,281.50	1689
ENG059	524,578.20	4,398,281.50	1689
ENG060	524,590.75	4,398,281.50	1689
ENG061	524,597.16	4,398,281.50	1689
ENG062	524,603.57	4,398,281.50	1689
ENG063	524,609.99	4,398,281.50	1689
ENG064	524,616.40	4,398,281.50	1689
ENG065	524,622.81	4,398,281.50	1689
ENG066	524,629.22	4,398,281.50	1689
ENG067	524,635.63	4,398,281.50	1689
ENG068	524,642.04	4,398,281.50	1689
ENG069	524,648.46	4,398,281.50	1689
ENG070	524,654.87	4,398,281.50	1689
ENG071	524,661.28	4,398,281.50	1689
ENG072	524,667.69	4,398,281.50	1689
ENG073	524,674.10	4,398,281.50	1689
ENG074	524,680.51	4,398,281.50	1689
ENG075	524,690.49	4,398,281.50	1689
ENG076	524,696.90	4,398,281.50	1689
ENG077	524,703.31	4,398,281.50	1689
ENG078	524,709.73	4,398,281.50	1689
ENG079	524,716.14	4,398,281.50	1689
ENG080	524,722.55	4,398,281.50	1689
ENG081	524,728.96	4,398,281.50	1689
ENG082	524,735.37	4,398,281.50	1689
ENG083	524,741.78	4,398,281.50	1689
ENG084	524,748.20	4,398,281.50	1689
ENG085	524,754.61	4,398,281.50	1689
ENG086	524,761.02	4,398,281.50	1689
ENG087	524,767.43	4,398,281.50	1689
ENG088	524,773.84	4,398,281.50	1689
ENG089	524,817.16	4,398,293.65	1689
ENG090	524,462.83	4,398,102.34	1689
ENG091	524,469.24	4,398,102.34	1689
ENG092	524,475.65	4,398,102.34	1689
ENG093	524,482.07	4,398,102.34	1689
ENG094	524,488.48	4,398,102.34	1689
ENG095	524,494.89	4,398,102.34	1689
ENG096	524,501.30	4,398,102.34	1689
ENG097	524,507.71	4,398,102.34	1689
ENG098	524,514.12	4,398,102.34	1689
ENG099	524,520.54	4,398,102.34	1689
ENG100	524,526.95	4,398,102.34	1689

Source	UTM Easting (X) (m)	UTM Northing (Y) (m)	Base Elevation (m)
ENG101	524,533.36	4,398,102.34	1689
ENG102	524,539.77	4,398,102.34	1689
ENG103	524,546.18	4,398,102.34	1689
ENG104	524,552.59	4,398,102.34	1689
ENG105	524,559.00	4,398,102.34	1689
ENG106	524,565.42	4,398,102.34	1689
ENG107	524,571.83	4,398,102.34	1689
ENG108	524,578.24	4,398,102.34	1689
ENG109	524,590.71	4,398,102.34	1689
ENG110	524,597.12	4,398,102.34	1689
ENG111	524,603.53	4,398,102.34	1689
ENG112	524,609.95	4,398,102.34	1689
ENG113	524,616.36	4,398,102.34	1689
ENG114	524,622.77	4,398,102.34	1689
ENG115	524,629.18	4,398,102.34	1689
ENG116	524,635.59	4,398,102.34	1689
ENG117	524,642.00	4,398,102.34	1689
ENG118	524,648.42	4,398,102.34	1689
ENG119	524,654.83	4,398,102.34	1689
ENG120	524,661.24	4,398,102.34	1689
ENG121	524,667.65	4,398,102.34	1689
ENG122	524,674.06	4,398,102.34	1689
ENG123	524,680.47	4,398,102.34	1689
ENG124	524,690.48	4,398,102.34	1689
ENG125	524,696.89	4,398,102.34	1689
ENG126	524,703.30	4,398,102.34	1689
ENG127	524,709.72	4,398,102.34	1689
ENG128	524,716.13	4,398,102.34	1689
ENG129	524,722.54	4,398,102.34	1689
ENG130	524,728.95	4,398,102.34	1689
ENG131	524,735.36	4,398,102.34	1689
ENG132	524,741.77	4,398,102.34	1689
ENG133	524,748.19	4,398,102.34	1689
ENG134	524,754.60	4,398,102.34	1689
ENG135	524,761.01	4,398,102.34	1689
ENG136	524,767.42	4,398,102.34	1689
ENG137	524,773.83	4,398,102.34	1689
ENG138	524,817.08	4,398,090.04	1689

2.4 RECEPTOR GRID

A discrete Cartesian receptor grid extending out to 15 km from the proposed project sources was used in the AERMOD analysis. The ambient air boundary is defined by a physical fence that will preclude public access from the facility. Therefore, receptors were omitted on facility property within the boundary of the fence line. This fence is presented in the facility site map in Figure 1-3. Receptor spacing consisted of the following:

- 50 m spacing along the facility fence line;
- 100 m spacing from the fence line out to 1 km;
- 250 m spacing from 1 km to 3 km;
- 500 m spacing from 3 km to 10 km.
- 1000 m spacing from 10 km to 15 km.

Figure 2-1 and Figure 2-2 show the far-field and near-field receptor grids, respectively.

FIGURE 2-1 – FAR-FIELD RECEPTOR GRID

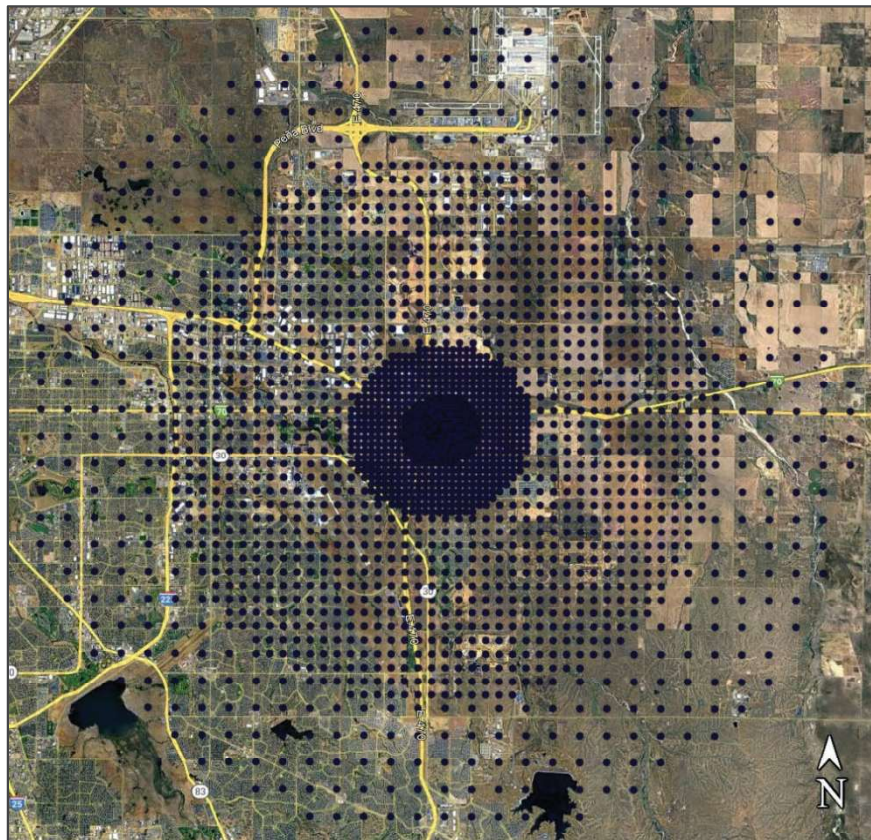
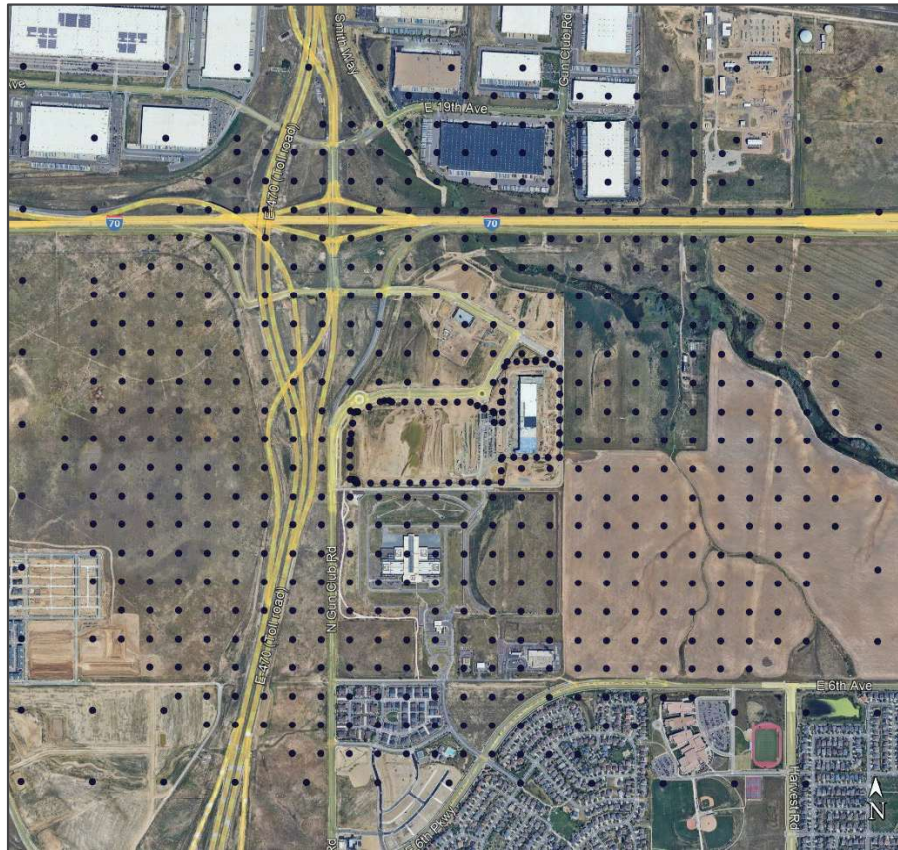
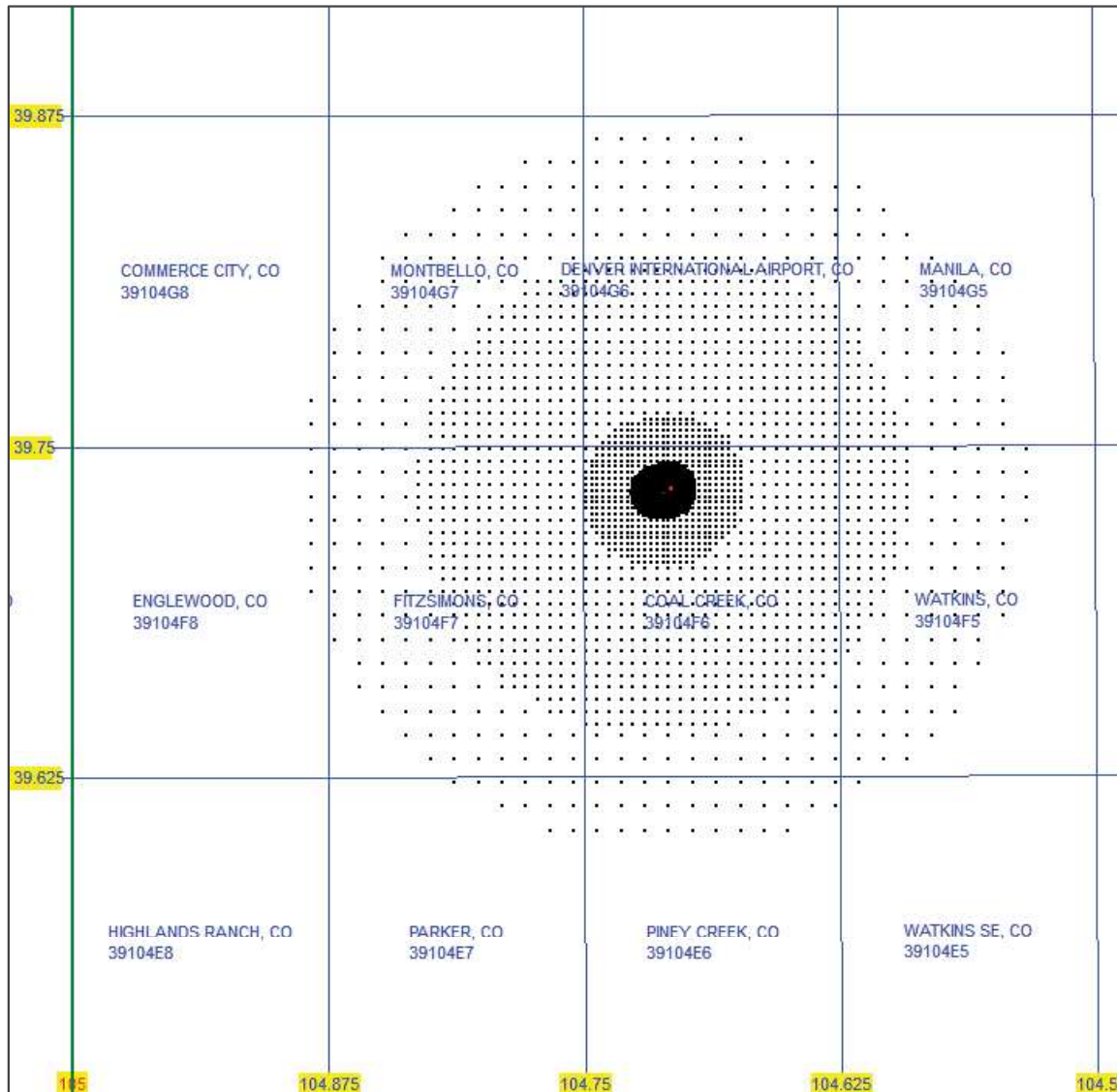


FIGURE 2-2 – NEAR-FIELD RECEPTOR GRID



The latest version of the AERMAP program (version 24142) was used to process 1/3 arc second resolution United States Geological Survey (USGS) National Elevation Data (NED) terrain files to develop hill scale and terrain elevation inputs for each receptor. Figure 2-3 shows a map of the quads used to develop the receptor terrain elevations.

FIGURE 2-3 – AERIAL MAP OF NED FILES IDENTIFIED FOR DEVELOPMENT OF ELEVATION DATA



2.5 DISPERSION CHARACTERISTICS

Using the Auer land-use typing method, most of the land use within the modeling domain is rural consisting of mainly farmland and residential buildings. Figure 1-2 shows the land use inclusive of 3 km surrounding the facility.

2.6 METEOROLOGICAL DATASET

On April 9, 2025, QTS received a Meteorological Data Determination from CDPHE approving the use of meteorological data from Denver International Airport. A copy of the Meteorological Data Determination is included in Appendix B. CDPHE provided surface and upper air data from Denver, Colorado for the years 2017 through 2021. The meteorological data was processed with AERMET version 24142 with the ADJ_U* option. All modeling analyses were performed using the meteorological data provided by CDPHE.

2.7 BUILDING DOWNWASH

The USEPA's Building Profile Input Program (BPIP-PRIME), Version 04274, was used to calculate downwash effects for all emission sources. Building and structure configurations and locations relative to the modeled sources were obtained from QTS. All point source release points at the site are expected to be below the greater of the GEP formula height calculated by BPIP-PRIME or 65 m (213 feet). The structures included in the downwash analysis include three data center buildings (DC1, DC2, and DC3), structures representing generator enclosures for ENG001-ENG138, and structures representing the concrete screen walls surrounding the generators. BPIP-PRIME was used to create AERMOD downwash effects from the point sources using these building parameters. Table 2-5 shows the detailed structure element coordinates, heights and tier definitions. Terrain elevations for all buildings and screen walls at the facility were assigned using estimated elevation data from Google Earth imagery.

TABLE 2-5 – BUILDING DIMENSIONS AND COORDINATES

Building Name	Tier #	Tier Height (m)	# of Corners	Corner 1 East (X)	Corner 1 North (Y)	Corner 2 East (X)	Corner 2 North (Y)	Corner 3 East (X)	Corner 3 North (Y)	Corner 4 East (X)	Corner 4 North (Y)	Corner 5 East (X)	Corner 5 North (Y)	Corner 6 East (X)	Corner 6 North (Y)
DC1_Bldg	1	12.80	12	524975.88	4398147.07	525049.97	4398146.49	525052.25	4398404.82	525079.95	4398404.30	525080.01	4398432.02	525035.37	4398432.59
	2	18.59	8	524975.88	4398147.07	525049.97	4398146.49	525052.25	4398404.82	524994.99	4398405.18	524992.75	4398161.30	524989.20	4398161.45
GENS1	1	5.51	4	525075.61	4398147.46	525087.40	4398147.30	525089.63	4398399.61	525077.96	4398399.62	-	-	-	-
GENS1_H	1	5.51	4	525083.12	4398404.68	525094.82	4398404.58	525094.87	4398408.93	525083.21	4398409.05	-	-	-	-
DC1_A	1	6.10	4	525049.95	4398146.22	525096.10	4398145.57	525096.10	4398145.81	525049.95	4398146.47	-	-	-	-
DC1_B	1	6.10	4	525096.10	4398145.82	525096.10	4398145.57	525111.09	4398161.00	525111.09	4398161.25	-	-	-	-
DC1_C	1	6.10	4	525111.09	4398161.25	525111.34	4398161.25	525112.46	4398386.08	525112.21	4398386.08	-	-	-	-
DC1_D	1	6.10	4	525112.21	4398386.08	525112.21	4398385.83	525095.69	4398395.63	525095.69	4398395.88	-	-	-	-
DC1_E	1	6.10	4	525095.69	4398395.88	525095.69	4398395.63	525100.73	4398403.10	525100.73	4398403.35	-	-	-	-
DC1_F	1	6.10	4	525100.73	4398403.35	525100.98	4398403.35	525100.98	4398411.12	525100.73	4398411.12	-	-	-	-
DC1_G	1	6.10	4	525100.73	4398411.12	525100.73	4398411.37	525080.06	4398411.50	525080.06	4398411.25	-	-	-	-
DC2_Bldg	1	12.80	10	524446.50	4398273.60	524460.24	4398273.57	524460.20	4398252.90	524758.40	4398252.90	524758.40	4398259.40	524779.00	4398259.40
	2	16.15	8	524446.50	4398273.60	524460.24	4398273.57	524460.20	4398252.90	524758.40	4398252.90	524758.40	4398259.40	524779.00	4398259.40
DC2GEN1	1	5.25	4	524461.50	4398290.05	524461.50	4398278.77	524579.84	4398278.77	524579.84	4398290.05	-	-	-	-
	2	6.81	4	524462.39	4398287.70	524462.39	4398281.07	524578.61	4398281.07	524578.61	4398287.70	-	-	-	-
DC2GEN2	1	5.25	4	524589.34	4398290.05	524589.33	4398278.77	524681.84	4398278.77	524681.84	4398290.05	-	-	-	-
	2	6.81	4	524590.33	4398287.70	524590.33	4398281.07	524680.84	4398281.07	524680.84	4398287.70	-	-	-	-
DC2GEN3	1	5.25	4	524688.98	4398290.05	524688.98	4398278.77	524775.46	4398278.77	524775.46	4398290.05	-	-	-	-
	2	6.81	4	524690.18	4398287.70	524690.18	4398281.07	524774.22	4398281.07	524774.22	4398287.70	-	-	-	-
GENS2_H	1	5.25	4	524815.31	4398291.08	524818.86	4398291.08	524818.87	4398302.30	524815.32	4398302.30	-	-	-	-
	2	6.81	4	524816.44	4398300.10	524817.83	4398300.10	524817.83	4398293.16	524816.44	4398293.16	-	-	-	-
DC2_A	1	7.62	4	524460.19	4398292.64	524459.86	4398292.64	524459.85	4398273.52	524460.18	4398273.52	-	-	-	-
DC2_B	1	7.62	4	524460.23	4398293.01	524460.23	4398292.67	524481.43	4398301.95	524481.43	4398302.25	-	-	-	-
DC2_1	1	7.62	4	524481.43	4398302.30	524481.43	4398301.98	524520.30	4398301.98	524520.30	4398302.30	-	-	-	-
DC2_C	1	7.62	4	524520.63	4398316.07	524520.63	4398316.40	524791.81	4398316.40	524791.81	4398316.07	-	-	-	-
DC2_2	1	7.62	4	524520.63	4398316.40	524520.30	4398316.40	524520.30	4398301.98	524520.63	4398301.98	-	-	-	-
DC2_D	1	7.62	4	524791.79	4398304.95	524791.46	4398304.95	524791.46	4398316.07	524791.79	4398316.07	-	-	-	-
DC2_E	1	7.62	4	524791.79	4398305.28	524791.79	4398304.95	524820.51	4398304.95	524820.51	4398305.28	-	-	-	-
DC2_F	1	7.62	4	524820.84	4398286.81	524820.51	4398286.81	524820.51	4398305.28	524820.84	4398305.28	-	-	-	-

Building Name	Tier #	Tier Height (m)	# of Corners	Corner 1 East (X)	Corner 1 North (Y)	Corner 2 East (X)	Corner 2 North (Y)	Corner 3 East (X)	Corner 3 North (Y)	Corner 4 East (X)	Corner 4 North (Y)	Corner 5 East (X)	Corner 5 North (Y)	Corner 6 East (X)	Corner 6 North (Y)
DC3_Bldg	1	12.80	10	524446.40	4398110.50	524460.10	4398110.50	524460.10	4398130.36	524772.70	4398130.36	524772.70	4398125.82	524778.90	4398125.82
	2	16.15	8	524446.40	4398110.50	524460.10	4398110.50	524460.10	4398130.36	524772.70	4398130.36	524772.70	4398125.82	524778.90	4398125.82
DC3GEN1	1	5.25	4	524461.44	4398105.05	524461.43	4398093.77	524579.78	4398093.77	524579.78	4398105.05	-	-	-	-
	2	6.81	4	524462.43	4398102.72	524462.43	4398096.09	524578.65	4398096.09	524578.65	4398102.72	-	-	-	-
DC3GEN2	1	5.25	4	524589.34	4398105.05	524589.33	4398093.77	524681.84	4398093.77	524681.84	4398105.05	-	-	-	-
	2	6.81	4	524590.33	4398102.72	524590.33	4398096.09	524680.84	4398096.09	524680.84	4398102.72	-	-	-	-
DC3GEN3	1	5.25	4	524688.88	4398105.05	524688.88	4398093.77	524775.36	4398093.77	524775.36	4398105.05	-	-	-	-
	2	6.81	4	524690.08	4398102.72	524690.08	4398096.09	524774.12	4398096.09	524774.12	4398102.72	-	-	-	-
GENS3_H	1	5.25	4	524815.25	4398081.44	524818.80	4398081.44	524818.81	4398092.66	524815.26	4398092.66	-	-	-	-
	2	6.81	4	524816.38	4398090.46	524817.77	4398090.46	524817.77	4398083.52	524816.38	4398083.52	-	-	-	-
DC3_A	1	7.62	4	524459.04	4398110.51	524458.71	4398110.51	524458.71	4398087.65	524459.04	4398087.65	-	-	-	-
DC3_B	1	7.62	4	524459.04	4398087.97	524459.04	4398087.65	524491.00	4398087.65	524491.00	4398087.97	-	-	-	-
DC3_3	1	7.62	4	524491.31	4398087.96	524490.98	4398087.96	524490.99	4398071.64	524491.35	4398071.64	-	-	-	-
DC3_C	1	7.62	4	524491.36	4398071.98	524491.36	4398071.65	524779.79	4398071.29	524779.79	4398071.62	-	-	-	-
DC3_H	1	7.62	4	524779.79	4398071.63	524779.46	4398071.63	524779.46	4398087.59	524779.79	4398087.59	-	-	-	-
DC3_G	1	7.62	4	524779.80	4398087.60	524779.80	4398087.27	524794.15	4398087.27	524794.15	4398087.60	-	-	-	-
DC3_4	1	7.62	4	524794.15	4398087.60	524794.15	4398087.27	524808.93	4398078.12	524808.93	4398078.45	-	-	-	-
DC3_E	1	7.62	4	524808.93	4398078.45	524808.93	4398078.12	524821.47	4398078.12	524821.47	4398078.45	-	-	-	-
DC3_F	1	7.62	4	524821.45	4398078.45	524821.12	4398078.45	524821.12	4398095.59	524821.45	4398095.59	-	-	-	-

Building Name	Tier #	Tier Height (m)	# of Corners	Corner 7 East (X)	Corner 7 North (Y)	Corner 8 East (X)	Corner 8 North (Y)	Corner 9 East (X)	Corner 9 North (Y)	Corner 10 East (X)	Corner 10 North (Y)	Corner 11 East (X)	Corner 11 North (Y)	Corner 12 East (X)	Corner 12 North (Y)
DC1_Bldg	1	12.80	12	525035.44	4398430.36	524995.20	4398430.62	524992.75	4398161.30	524989.20	4398161.45	524989.21	4398157.90	524976.08	4398157.86
	2	18.59	8	524989.21	4398157.90	524976.08	4398157.86	-	-	-	-	-	-	-	-
DC2_Bldg	1	12.80	10	524779.00	4398286.80	524847.30	4398286.80	524847.30	4398206.35	524446.50	4398206.35	-	-	-	-
	2	16.15	8	524779.00	4398206.35	524446.50	4398206.35	-	-	-	-	-	-	-	-
DC3_Bldg	1	12.80	10	524778.90	4398095.68	524847.20	4398095.68	524847.20	4398176.68	524446.40	4398176.68	-	-	-	-
	2	16.15	8	524778.90	4398176.68	524446.40	4398176.68					-	-	-	-



2.8 BACKGROUND CONCENTRATIONS

CDPHE was consulted regarding the offsite source inventory and determined that the use of an ambient background concentration to demonstrate compliance with the NAAQS was appropriate for the project. CDPHE provided ambient background concentrations for use in demonstrating compliance with the NAAQS in a letter on April 9, 2025. This included seasonal hourly background profiles for NO₂ and Ozone and seasonal daily PM_{2.5} concentrations. Copies of the letter and background concentrations provided by CDPHE are included in Appendix B.

2.9 NO_x TO NO₂ CONVERSION OPTIONS

The NO₂ simulations were conducted using the Tier 3 Plume Volume Molar Ratio Method (PVMRM) option, assuming a NO₂/NO_x in-stack ratio of 0.22, as previously approved by CDPHE for this facility. The NO₂ NAAQS modeling used the seasonal hourly background profiles for NO₂ and Ozone provided by CDPHE. Appendix B contains the ISR analysis used to determine the NO₂/NO_x ratio.

2.10 PART LOAD AND SOURCE GROUPS

The maximum number of engines needed for simultaneous non-emergency operation is seven (7). Therefore, modeling was performed using the top 7 worst-case engines across all 138 engines at the facility. The first step was to identify the top 7 worst-case engine grouping for each load case and averaging period, while also considering the possibility of a combination of different generator options.

The Kohler generator option (permitting for DC1 engines) used a unit emission rate of 1 gram/second in the modeling used to identify the top 7 worst-case engines. The other permitted and proposed engine options for generators at the site have slightly different stack parameters and emission rates compared to the Kohler engine. The following methodology was used to incorporate all engine types to identify the top 7 worst-case engines:

- Simulate 40 Kohler, MTU, and uncontrolled CAT engines in the same locations simultaneously at building DC1 for each load case and averaging period as well as 98 Holt CAT and 98 Yancey CAT engines simultaneously in the same locations at buildings DC2 and DC3 for each load case and averaging period. In total, there are 138 locations for generator exhausts, with 316 generators modeled per run to cover the three generator options at DC1 and the two generator options at DC2 and DC3.
- Assign each Kohler engine a unit emission rate of 1 gram/second. Assign each other engine a pro-rated gram/second emission rate based on the ratio of actual emissions to Kohler actual emissions (Table 2-6 shows the emission rates used for each load case and averaging period).
- Identify the maximum impact point for each load case and averaging period.
- For each maximum impact point identified, conduct a secondary simulation for that location and associated meteorological period to define source-by-source culpability at the maximum impact location.
- Rank all generators by decreasing impact at the maximum impact point.

- For short-term averaging periods, the worst-case engine group is defined by the highest 7 ranked culpable sources. If the same generator location appears twice in the first 7 units (e.g. ENG016-MTU and ENG016-Kohler both appear), then only the higher impacting unit in that location was kept.
- For annual averaging periods, the worst-case engine group is defined by identifying which generator type is the worst-case generator at each of the 138 generator locations; this is because the annual modeling will simulate all 138 generators running simultaneously with annualized emission rates.

Table 2-7 shows the top seven engines (based on maximum impact point culpability) for each load case and short-term averaging period. Table shows the 138 worst-case generators for each load case for the annual averaging period. Source names ending with "K" represent Kohler, "M" represents MTU, and "C" represents CAT for DC1; "H" represents Holt CAT and "Y" represents Yancey CAT for DC2 and DC3.

TABLE 2-6 – EMISSION RATES USED TO IDENTIFY WORST-CASE ENGINE GROUPS

Pollutant	Load	Kohler Actual lb/hr	MTU Actual lb/hr	DC1 CAT Actual lb/hr	Holt/Yancey CAT Actual lb/hr	Kohler g/s	MTU* g/s	DC1 CAT g/s	Holt/Yancey CAT g/s
NO₂	100	66.67	48.59	51.80	14.62	1	0.729	0.777	0.219
	75	23.66	33.73	31.81	11.73	1	1.426	1.344	0.496
	50	16.96	16.21	15.81	8.48	1	0.956	0.932	0.500
	25	8.78	7.82	8.05	8.05	1	0.891	0.917	0.917
PM_{2.5}	100	0.475	0.746	0.334	0.334	1	1.572	0.703	0.703
	75	0.712	0.696	0.217	0.217	1	0.977	0.305	0.305
	50	0.356	0.243	0.248	0.248	1	0.682	0.696	0.696
	25	0.475	0.438	0.256	0.256	1	0.923	0.540	0.540
PM₁₀	100	0.489	0.769	0.344	0.344	1	1.572	0.703	0.703
	75	0.734	0.717	0.224	0.224	1	0.977	0.305	0.305
	50	0.367	0.250	0.255	0.255	1	0.682	0.696	0.696
	25	0.489	0.452	0.264	0.264	1	0.923	0.540	0.540
CO	100	5.95	11.83	6.15	6.15	1	1.988	1.034	1.034
	75	15.63	7.33	2.95	2.95	1	0.469	0.189	0.189
	50	5.65	3.01	2.45	2.45	1	0.533	0.434	0.434
	25	11.01	4.22	3.38	3.38	1	0.383	0.307	0.307
SO₂	100	0.0439	0.0446	0.0441	0.0441	1	1.014	1.004	1.004
	75	0.0330	0.0334	0.0335	0.0335	1	1.013	1.016	1.016
	50	0.0220	0.0222	0.0229	0.0229	1	1.013	1.043	1.043
	25	0.0110	0.0111	0.0125	0.0125	1	1.009	1.137	1.137

*Emission rate is ratio of generator specific actual emissions to Kohler actual emissions.

TABLE 2-7 – TOP SEVEN ENGINES CULPABILITY SUMMARY – 1-HR, 3-HR, 8-HR, AND 24-HR

1-hour NO ₂	Load Case			
Culp Rank	100%	75%	50%	25%
1	G7K100	G6M75	G6K50	G111H25
2	G9K100	G7M75	G7K50	G110H25
3	G8K100	G9M75	G10K50	G109H25
4	G10K100	G8M75	G8K50	G112H25
5	G6K100	G10M75	G9K50	G113H25
6	G11K100	G11M75	G11K50	G114H25
7	G12K100	G5M75	G5K50	G108H25
1-hour SO ₂	Load Case			
Culp Rank	100%	75%	50%	25%
1	G7K100	G111Y75	G111H50	G111H25
2	G9K100	G110H75	G112H50	G110H25
3	G8K100	G112H75	G110H50	G109H25
4	G10K100	G76H75	G109H50	G112H25
5	G6K100	G75H75	G113H50	G113H25
6	G11K100	G109H75	G75H50	G114H25
7	G12K100	G77H75	G76H50	G108H25
3-hour SO ₂	Load Case			
Culp Rank	100%	75%	50%	25%
1	G28K100	G128H75	G128H50	G129H25
2	G27K100	G129H75	G129H50	G128H25
3	G26K100	G127H75	G127H50	G130H25
4	G25K100	G130H75	G130H50	G127H25
5	G29K100	G126H75	G126H50	G131H25
6	G24M100	G125H75	G131H50	G126H25
7	G23K100	G131H75	G125H50	G125H25
1-hour CO	Load Case			
Culp Rank	100%	75%	50%	25%
1	G8M100	G8K75	G6K50	G9K25
2	G9M100	G9K75	G7K50	G8K25
3	G10M100	G7K75	G10K50	G10K25
4	G6M100	G10K75	G8K50	G7K25
5	G7M100	G6K75	G9K50	G11K25
6	G11M100	G11K75	G11K50	G12K25
7	G5M100	G12K75	G5K50	G6K25
8-hour CO	Load Case			
Culp Rank	100%	75%	50%	25%
1	G18M100	G18K75	G20K50	G38K25

2	G19M100	G19K75	G21K50	G37K25
3	G17M100	G17K75	G19K50	G39K25
4	G20M100	G20K75	G22K50	G36K25
5	G16M100	G16K75	G18K50	G31K25
6	G21M100	G21K75	G23K50	G30K25
7	G15M100	G15K75	G17K50	G29K25
24-hour PM₁₀/PM_{2.5}	Load Case			
Culp Rank	100%	75%	50%	25%
1	G20M100	G17M75	G17K50	G18K25
2	G18M100	G18M75	G18K50	G19K25
3	G19M100	G19M75	G19K50	G17K25
4	G17M100	G16M75	G16K50	G20K25
5	G21M100	G20M75	G20K50	G16K25
6	G16M100	G15M75	G15K50	G21K25
7	G22M100	G21M75	G21K50	G15K25

TABLE 2-8 – TOP 40 ENGINES CULPABILITY SUMMARY - ANNUAL

Culp Rank	Annual NO₂				Annual PM_{2.5}			
	100%	75%	50%	25%	100%	75%	50%	25%
1	G22K100	G22M75	G22K50	G21K25	G22M100	G22M75	G22K50	G21K25
2	G21K100	G21M75	G21K50	G22K25	G21M100	G21M75	G21K50	G22K25
3	G23K100	G23M75	G23K50	G20K25	G23M100	G23M75	G23K50	G20K25
4	G20K100	G20M75	G20K50	G23K25	G20M100	G20M75	G20K50	G23K25
5	G24K100	G24M75	G24K50	G19K25	G24M100	G24M75	G24K50	G19K25
6	G19K100	G19M75	G19K50	G24K25	G19M100	G19M75	G19K50	G24K25
7	G18K100	G25M75	G18K50	G18K25	G18M100	G25M75	G18K50	G18K25
8	G25K100	G18M75	G25K50	G25K25	G25M100	G18M75	G25K50	G25K25
9	G17K100	G17M75	G17K50	G17K25	G17M100	G17M75	G17K50	G17K25
10	G26K100	G26M75	G26K50	G26K25	G26M100	G26M75	G26K50	G26K25
11	G16K100	G16M75	G16K50	G16K25	G16M100	G16M75	G16K50	G16K25
12	G27K100	G27M75	G27K50	G15K25	G27M100	G27M75	G27K50	G15K25
13	G15K100	G15M75	G15K50	G27K25	G15M100	G15M75	G15K50	G27K25
14	G28K100	G28M75	G14K50	G14K25	G28M100	G28M75	G14K50	G14K25
15	G14K100	G14M75	G28K50	G13K25	G14M100	G14M75	G28K50	G13K25
16	G13K100	G13M75	G13K50	G28K25	G13M100	G13M75	G13K50	G28K25
17	G29K100	G29M75	G29K50	G12K25	G29M100	G29M75	G29K50	G12K25
18	G12K100	G12M75	G12K50	G29K25	G12M100	G12M75	G12K50	G29K25
19	G30K100	G30M75	G30K50	G11K25	G30M100	G30M75	G30K50	G11K25
20	G11K100	G11M75	G11K50	G10K25	G11M100	G11M75	G11K50	G10K25
21	G31K100	G31M75	G10K50	G30K25	G31M100	G31M75	G10K50	G30K25
22	G10K100	G10M75	G31K50	G9K25	G10M100	G10M75	G31K50	G9K25
23	G9K100	G9M75	G9K50	G31K25	G9M100	G9M75	G9K50	G31K25
24	G32K100	G32M75	G32K50	G8K25	G32M100	G32M75	G32K50	G8K25

Culp Rank	Annual NO ₂				Annual PM _{2.5}			
	100%	75%	50%	25%	100%	75%	50%	25%
25	G8K100	G8M75	G8K50	G32K25	G8M100	G8M75	G8K50	G32K25
26	G33K100	G33M75	G33K50	G7K25	G33M100	G33M75	G33K50	G7K25
27	G7K100	G7M75	G7K50	G33K25	G7M100	G7M75	G7K50	G33K25
28	G34K100	G34M75	G34K50	G6K25	G34M100	G34M75	G34K50	G6K25
29	G6K100	G6M75	G6K50	G34K25	G6M100	G6M75	G6K50	G34K25
30	G35K100	G35M75	G5K50	G5K25	G35M100	G35M75	G5K50	G5K25
31	G5K100	G5M75	G35K50	G35K25	G5M100	G5M75	G35K50	G35K25
32	G36K100	G4M75	G4K50	G4K25	G36M100	G4M75	G4K50	G4K25
33	G4K100	G36M75	G36K50	G36K25	G4M100	G36M75	G36K50	G36K25
34	G37K100	G3M75	G3K50	G3K25	G37M100	G3M75	G3K50	G3K25
35	G3K100	G37M75	G37K50	G37K25	G3M100	G37M75	G37K50	G37K25
36	G2K100	G2M75	G2K50	G2K25	G2M100	G2M75	G2K50	G2K25
37	G38K100	G38M75	G38K50	G38K25	G38M100	G38M75	G38K50	G38K25
38	G1K100	G1M75	G1K50	G39K25	G1M100	G1M75	G1K50	G39K25
39	G39K100	G39M75	G39K50	G1K25	G39M100	G39M75	G39K50	G1K25
40	G40K100	G40M75	G40K50	G40K25	G40M100	G40M75	G40K50	G40K25
41	G138H100	G138H75	G138H50	G138H25	G138H100	G138H75	G138H50	G138H25
42	G137H100	G137H75	G137H50	G137H25	G137H100	G137H75	G137H50	G137H25
43	G136H100	G136H75	G136H50	G89H25	G136H100	G136H75	G136H50	G89H25
44	G135H100	G135H75	G89H50	G136H25	G135H100	G135H75	G89H50	G136H25
45	G134H100	G134H75	G135H50	G135H25	G134H100	G134H75	G135H50	G135H25
46	G133H100	G89H75	G134H50	G134H25	G133H100	G89H75	G134H50	G134H25
47	G132H100	G133H75	G133H50	G88H25	G132H100	G133H75	G133H50	G88H25
48	G89H100	G132H75	G132H50	G87H25	G89H100	G132H75	G132H50	G87H25
49	G131H100	G88H75	G88H50	G133H25	G131H100	G88H75	G88H50	G133H25
50	G130H100	G87H75	G87H50	G86H25	G130H100	G87H75	G87H50	G86H25
51	G88H100	G131H75	G131H50	G132H25	G88H100	G131H75	G131H50	G132H25
52	G129H100	G130H75	G86H50	G84H25	G129H100	G130H75	G86H50	G84H25
53	G128H100	G129H75	G130H50	G131H25	G128H100	G129H75	G130H50	G131H25
54	G87H100	G86H75	G129H50	G85H25	G87H100	G86H75	G129H50	G85H25
55	G127H100	G128H75	G128H50	G130H25	G127H100	G128H75	G128H50	G130H25
56	G126H100	G127H75	G127H50	G80H25	G126H100	G127H75	G127H50	G80H25
57	G86H100	G126H75	G84H50	G129H25	G86H100	G126H75	G84H50	G129H25
58	G125H100	G125H75	G126H50	G79H25	G125H100	G125H75	G126H50	G79H25
59	G77H100	G84H75	G125H50	G81H25	G77H100	G84H75	G125H50	G81H25
60	G78H100	G77H75	G77H50	G78H25	G78H100	G77H75	G77H50	G78H25
61	G79H100	G78H75	G78H50	G82H25	G79H100	G78H75	G78H50	G82H25
62	G84H100	G79H75	G85H50	G77H25	G84H100	G79H75	G85H50	G77H25
63	G124H100	G80H75	G79H50	G128H25	G124H100	G80H75	G79H50	G128H25
64	G80H100	G124H75	G80H50	G83H25	G80H100	G124H75	G80H50	G83H25
65	G123H100	G85H75	G81H50	G127H25	G123H100	G85H75	G81H50	G127H25
66	G122H100	G81H75	G124H50	G126H25	G122H100	G81H75	G124H50	G126H25
67	G74H100	G123H75	G82H50	G76H25	G74H100	G123H75	G82H50	G76H25

Culp Rank	Annual NO ₂				Annual PM _{2.5}			
	100%	75%	50%	25%	100%	75%	50%	25%
68	G75H100	G75H75	G75H50	G125H25	G75H100	G75H75	G76H50	G125H25
69	G73H100	G122H75	G76H50	G75H25	G73H100	G122H75	G75H50	G75H25
70	G85H100	G76H75	G74H50	G74H25	G85H100	G76H75	G74H50	G74H25
71	G76H100	G74H75	G123H50	G73H25	G76H100	G74H75	G123H50	G73H25
72	G81H100	G73H75	G73H50	G124H25	G81H100	G73H75	G73H50	G124H25
73	G121H100	G82H75	G83H50	G72H25	G121H100	G82H75	G83H50	G72H25
74	G72H100	G72H75	G72H50	G123H25	G72H100	G72H75	G72H50	G123H25
75	G71H100	G121H75	G122H50	G71H25	G71H100	G121H75	G122H50	G71H25
76	G120H100	G71H75	G71H50	G122H25	G120H100	G71H75	G71H50	G122H25
77	G70H100	G70H75	G121H50	G70H25	G70H100	G70H75	G121H50	G70H25
78	G119H100	G120H75	G70H50	G121H25	G119H100	G120H75	G70H50	G121H25
79	G82H100	G83H75	G120H50	G69H25	G82H100	G83H75	G120H50	G69H25
80	G69H100	G69H75	G69H50	G120H25	G69H100	G69H75	G69H50	G120H25
81	G118H100	G119H75	G68H50	G68H25	G118H100	G119H75	G68H50	G68H25
82	G68H100	G68H75	G119H50	G119H25	G68H100	G68H75	G119H50	G119H25
83	G67H100	G118H75	G67H50	G67H25	G67H100	G118H75	G67H50	G67H25
84	G117H100	G67H75	G118H50	G118H25	G117H100	G67H75	G118H50	G118H25
85	G83H100	G117H75	G66H50	G66H25	G83H100	G117H75	G66H50	G66H25
86	G66H100	G66H75	G117H50	G65H25	G66H100	G66H75	G117H50	G65H25
87	G116H100	G65H75	G65H50	G117H25	G116H100	G65H75	G65H50	G117H25
88	G65H100	G116H75	G116H50	G64H25	G65H100	G116H75	G116H50	G64H25
89	G115H100	G64H75	G64H50	G116H25	G115H100	G64H75	G64H50	G116H25
90	G64H100	G115H75	G115H50	G63H25	G64H100	G115H75	G115H50	G63H25
91	G114H100	G63H75	G63H50	G115H25	G114H100	G63H75	G63H50	G115H25
92	G63H100	G114H75	G114H50	G62H25	G63H100	G114H75	G114H50	G62H25
93	G62H100	G62H75	G62H50	G61H25	G62H100	G62H75	G62H50	G61H25
94	G113H100	G113H75	G61H50	G114H25	G113H100	G113H75	G61H50	G114H25
95	G61H100	G61H75	G113H50	G60H25	G61H100	G61H75	G113H50	G60H25
96	G112H100	G112H75	G60H50	G59H25	G112H100	G112H75	G60H50	G59H25
97	G60H100	G60H75	G112H50	G113H25	G60H100	G60H75	G112H50	G113H25
98	G111H100	G111H75	G111H50	G58H25	G111H100	G111H75	G111H50	G58H25
99	G110H100	G59H75	G59H50	G57H25	G110H100	G59H75	G59H50	G57H25
100	G59H100	G110H75	G58H50	G112H25	G59H100	G110H75	G58H50	G112H25
101	G58H100	G58H75	G110H50	G56H25	G58H100	G58H75	G110H50	G56H25
102	G109H100	G109H75	G57H50	G111H25	G109H100	G109H75	G57H50	G111H25
103	G57H100	G57H75	G109H50	G55H25	G57H100	G57H75	G109H50	G55H25
104	G56H100	G56H75	G56H50	G110H25	G56H100	G56H75	G56H50	G110H25
105	G55H100	G55H75	G55H50	G54H25	G55H100	G55H75	G55H50	G54H25
106	G108H100	G108H75	G54H50	G109H25	G108H100	G108H75	G54H50	G109H25
107	G54H100	G54H75	G53H50	G53H25	G54H100	G54H75	G53H50	G53H25
108	G107H100	G53H75	G108H50	G108H25	G107H100	G53H75	G108H50	G108H25
109	G53H100	G107H75	G52H50	G52H25	G53H100	G107H75	G52H50	G52H25
110	G106H100	G52H75	G51H50	G107H25	G106H100	G52H75	G51H50	G107H25

Culp Rank	Annual NO ₂				Annual PM _{2.5}			
	100%	75%	50%	25%	100%	75%	50%	25%
111	G52H100	G106H75	G50H50	G51H25	G52H100	G106H75	G50H50	G51H25
112	G105H100	G51H75	G107H50	G106H25	G105H100	G51H75	G107H50	G106H25
113	G51H100	G50H75	G49H50	G50H25	G51H100	G50H75	G49H50	G50H25
114	G50H100	G105H75	G106H50	G105H25	G50H100	G105H75	G106H50	G105H25
115	G104H100	G49H75	G48H50	G49H25	G104H100	G49H75	G48H50	G49H25
116	G49H100	G104H75	G47H50	G104H25	G49H100	G104H75	G47H50	G104H25
117	G103H100	G48H75	G105H50	G48H25	G103H100	G48H75	G105H50	G48H25
118	G48H100	G47H75	G46H50	G103H25	G48H100	G47H75	G46H50	G103H25
119	G102H100	G103H75	G104H50	G47H25	G102H100	G103H75	G104H50	G47H25
120	G47H100	G46H75	G45H50	G102H25	G47H100	G46H75	G45H50	G102H25
121	G46H100	G45H75	G103H50	G46H25	G46H100	G45H75	G103H50	G46H25
122	G101H100	G102H75	G102H50	G101H25	G101H100	G102H75	G102H50	G101H25
123	G45H100	G44H75	G44H50	G45H25	G45H100	G44H75	G44H50	G45H25
124	G100H100	G101H75	G101H50	G100H25	G100H100	G101H75	G101H50	G100H25
125	G44H100	G43H75	G100H50	G99H25	G44H100	G43H75	G100H50	G99H25
126	G99H100	G42H75	G43H50	G44H25	G99H100	G42H75	G43H50	G44H25
127	G43H100	G100H75	G99H50	G98H25	G43H100	G100H75	G99H50	G98H25
128	G98H100	G99H75	G98H50	G43H25	G98H100	G99H75	G98H50	G43H25
129	G42H100	G41H75	G42H50	G97H25	G42H100	G41H75	G42H50	G97H25
130	G97H100	G98H75	G97H50	G42H25	G97H100	G98H75	G97H50	G42H25
131	G41H100	G97H75	G96H50	G96H25	G41H100	G97H75	G96H50	G96H25
132	G96H100	G96H75	G41H50	G41H25	G96H100	G96H75	G41H50	G41H25
133	G95H100	G95H75	G95H50	G95H25	G95H100	G95H75	G95H50	G95H25
134	G94H100	G94H75	G94H50	G94H25	G94H100	G94H75	G94H50	G94H25
135	G93H100	G93H75	G93H50	G93H25	G93H100	G93H75	G93H50	G93H25
136	G92H100	G92H75	G92H50	G92H25	G92H100	G92H75	G92H50	G92H25
137	G91H100	G91H75	G91H50	G91H25	G91H100	G91H75	G91H50	G91H25
138	G90H100	G90H75	G90H50	G90H25	G90H100	G90H75	G90H50	G90H25

For the NAAQS analysis, AERMOD was run with only the 7 worst-case engines with actual emission rates for each pollutant and short-term averaging period (and the 138 worst-case engines for each engine location for the annual averaging period). If the NAAQS modeling showed compliance with the NAAQS, then no further modeling was needed. If a NAAQS violation was predicted, then further evaluation was required; the 1-hour NO₂ assessment predicted impacts above the NAAQS; therefore, a Monte Carlo Analysis was performed.

2.11 MONTE CARLO MODELING APPROACH

Monte Carlo analyses are often used as part of modeling simulations for facilities that expect to have high, short-term emission rates that occur intermittently for air pollutants with statistically based ambient standards (e.g., 1-hour average NO₂). For the proposed emergency generators at the QTS facility, a Monte Carlo approach provides a way to assess realistic operating hours and capture design value variability. Notably, Monte Carlo is only beneficial if the 5-year model results have a low probability of exceeding the value of the ambient standard when randomly selected (i.e., the majority of modeled results should be below the value of the ambient standard). Monte Carlo simulations were conducted for 1-hour NO₂ with emergency generators modeled as operating 36 hours per year.

A Monte Carlo simulation involved modeling five years of constant emissions, randomly selecting a subset of the modeled hourly concentrations based on operational expectations and calculating the design value from that subset. This process was conducted 1,000 times (to converge on a stable estimate of the median), and the median design value was calculated for comparison to the NAAQS.

For this analysis, a Monte Carlo simulation was conducted to assess compliance with the 1-hour NO₂ NAAQS as follows:

- AERMOD was run to predict hourly concentrations from the top 7 worst-case generators at each receptor between 7 AM and 7 PM local time each day over the 5-year model simulation.
- AERMOD was set up to export post files in a binary format containing all the hourly concentrations per receptor, including background.
- The 1-hour NO₂ design value concentration was calculated for comparison to the NAAQS as follows:
 1. 36 hours were randomly selected from model year 1 during the source's operating timeframe (7 AM – 7 PM).
 2. The same 36 randomly selected hours were then extracted for the next four years of modeled concentrations so that each modeled year would have the same hours extracted as model year one.
 3. The randomly selected hours were then exported to an external file for the reproducibility of results.
 4. The 8th high daily maximum 1-hour NO₂ concentration was selected for each receptor.

5. For each year and receptor pair, the 8th highest value was selected from a list of concentrations sorted in descending order (i.e., concentrations ordered from highest to lowest).
6. Then, each receptor's mean was calculated on each receptor over the five years of modeled concentrations.
7. These mean concentrations were then saved in a database and stored in an external data file for reproducibility. This mean value represents the result from one iteration of the Monte Carlo analysis.
8. The above steps are then iterated 1000 times to converge on a solution.
9. From the stored mean concentrations in Step 7, the median concentration for each receptor was calculated over the entire dataset from the Monte Carlo analysis.
10. The maximum concentration over all the receptors in Step 9 was calculated and reported as the final model predicted concentration over all of the 1000 iterations.

This Monte Carlo analysis was conducted using the R programming platform and utilizing several open-source packages such as `data.table`, `dplyr`, `tidyr`, `doParallel`, `foreach`, and `magrittr`. Due to the nature of the millions of computations taking place, the Monte Carlo's iterative processes are done via parallel processing to reduce the runtime. The Monte Carlo analysis is wrapped up into a single R function which enables a user to control all aspects of the Monte Carlo approach (Operating times, Statistic output, number of modeled receptors, sample hours, number of cores for parallel processing, and the ability to re-run prior Monte Carlo analyses in a reanalysis procedure).

3. MODELING RESULTS AND CONCLUSION

Table 3-1 shows the AERMOD results, including background, for each modeled pollutant and averaging period. Compliance with the NAAQS was demonstrated in all cases except for 1-hour NO₂. As a result, for 1-hour NO₂, Monte Carlo analysis was needed to simulate the intermittent nature of these emergency generators.

TABLE 3-1 – NAAQS MODELING RESULTS FOR WORST-CASE ENGINE GROUPS

Pollutant	Avg Period	Rank	Load	Concentration ¹ (µg/m ³)	NAAQS (µg/m ³)
NO ₂	1-hr	5-yr avg H8H	25%	496	188
			50%	784	188
			75%	1,070	188
			100%	1,746	188
NO ₂	Annual	Max	25%	16.15	100
			50%	16.49	100
			75%	17.66	100
			100%	19.81	100
SO ₂	1-hr	5-yr avg H4H	25%	15.16	196
			50%	15.83	196
			75%	16.44	196
			100%	19.34	196
SO ₂	3-hr	H2H	25%	13.54	1,300
			50%	14.22	1,300
			75%	14.84	1,300
			100%	15.60	1,300
CO	1-hr	H2H	25%	4,809	40,000
			50%	3,215	40,000
			75%	4,787	40,000
			100%	4,113	40,000
CO	8-hr	H2H	25%	3,233	10,000
			50%	1,953	10,000
			75%	2,442	10,000
			100%	2,235	10,000
PM _{2.5}	24-hr	5-yr avg H8H	25%	24.53	35
			50%	21.31	35
			75%	27.00	35
			100%	26.86	35
PM _{2.5}	Annual	Max	25%	6.18	9
			50%	6.11	9
			75%	6.13	9
			100%	6.08	9
PM ₁₀	24-hr	5-yr avg H6H	25%	63.29	150
			50%	58.48	150
			75%	66.68	150
			100%	66.90	150

1. Concentrations include background.

The Monte-Carlo analysis was performed for the model-predicted concentrations resulting from grouping the top seven generators from each loading scenario with a limit of 36 operating hours per year during 12 daytime hours (7 am – 7 pm). The use of Monte Carlo more accurately reflects the operating nature of emergency generators onsite at QTS DEN1. The results from the top seven contributing generators, including seasonal hourly NO₂ background, can be seen in Table 3-2. Running Monte Carlo with the worst case, 1-hour NO₂ emission rates demonstrates compliance with the 1- hour NO₂ NAAQS.

TABLE 3-2 – 1-HOUR NO₂ RESULTS USING MONTE CARLO

Load Scenario	1-hour NO₂ Concentration (µg/m³) (including background)
25%	84.81
50%	113.20
75%	131.02
100%	178.09

Figure 3-1 through Figure 3-36 show isopleth maps of all AERMOD model-estimated concentrations (including background).

In conclusion, this modeling analysis has demonstrated that the use of any combination of generators for ENG001 – ENG138 at QTS DEN1 will comply with the NAAQS. All input and output files from the modeling analysis completed for the proposed project will be provided to CDPHE electronically (Appendix D).

FIGURE 3-1 - MODEL-ESTIMATED CONCENTRATIONS OF 1-HOUR NO₂ - 25% LOAD.



FIGURE 3-2 - MODEL-ESTIMATED CONCENTRATIONS OF 1-HOUR NO₂ - 50% LOAD



FIGURE 3-3 – MODEL-ESTIMATED CONCENTRATIONS OF 1-HOUR NO₂ – 75% LOAD

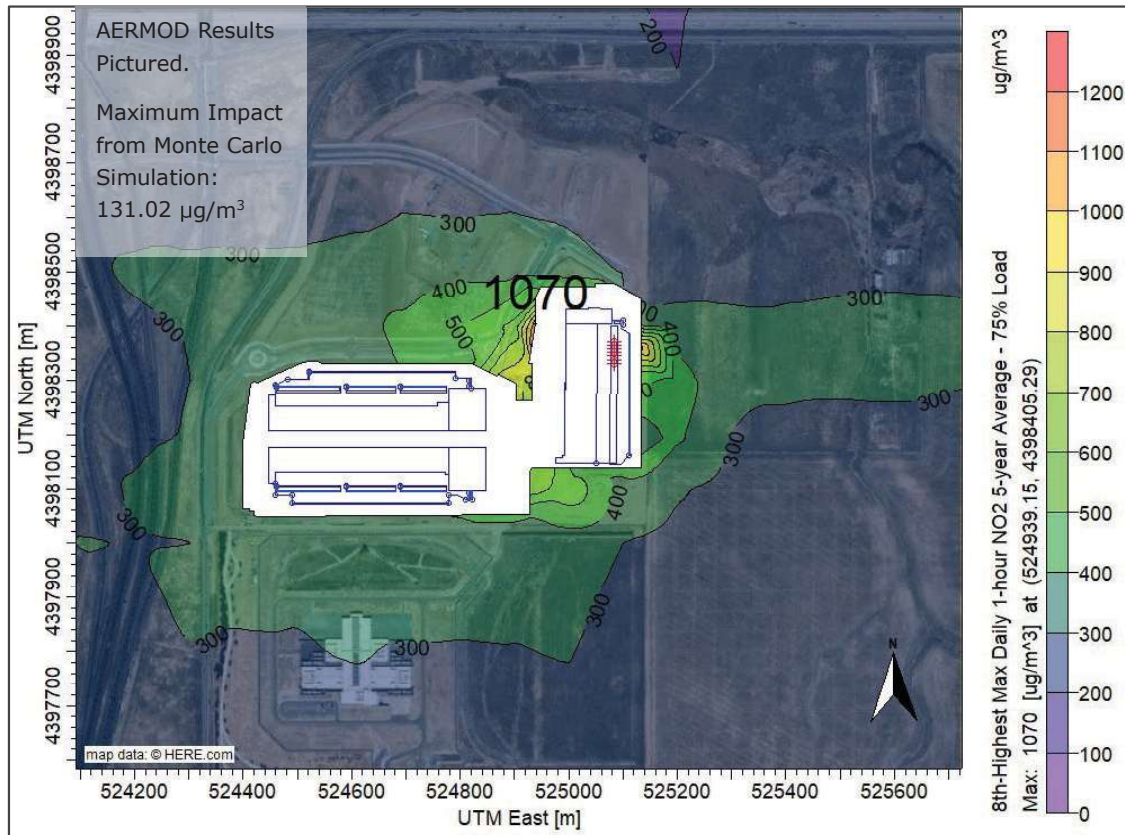


FIGURE 3-4 – MODEL-ESTIMATED CONCENTRATIONS OF 1-HOUR NO₂ – 100% LOAD

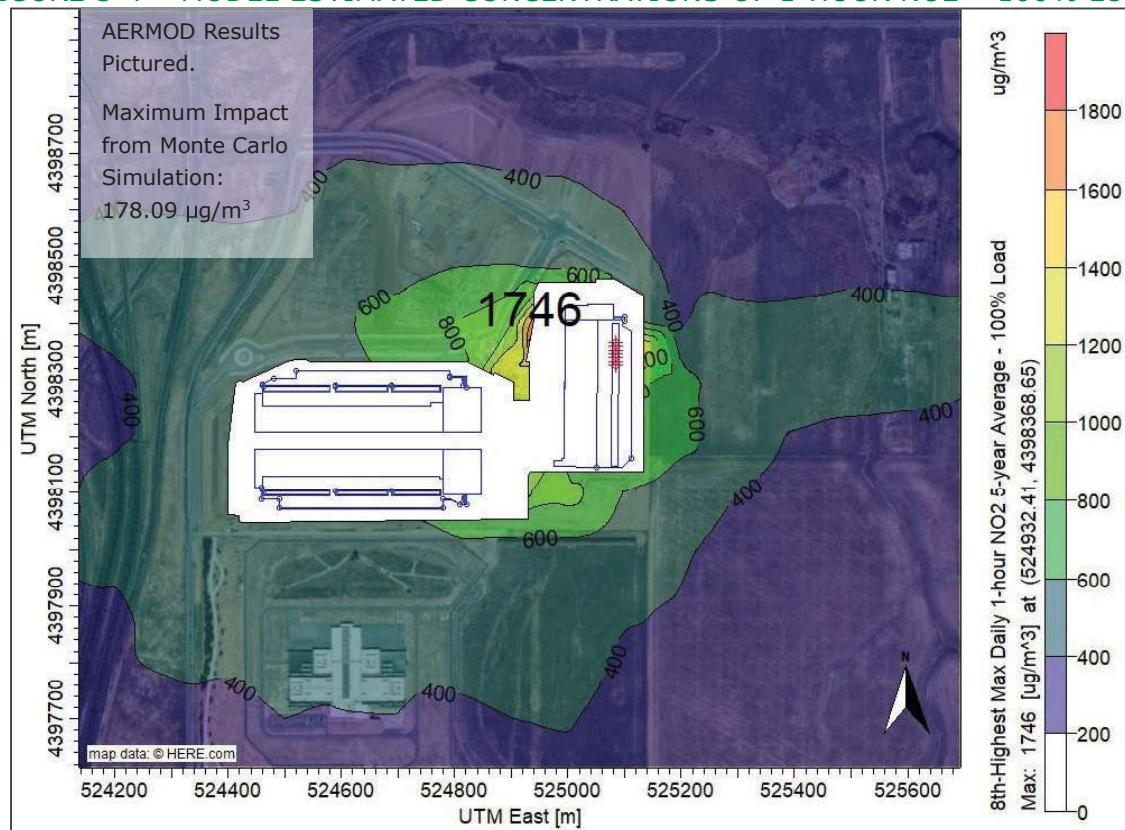


FIGURE 3-5 – MODEL-ESTIMATED CONCENTRATIONS OF ANNUAL NO₂ – 25% LOAD

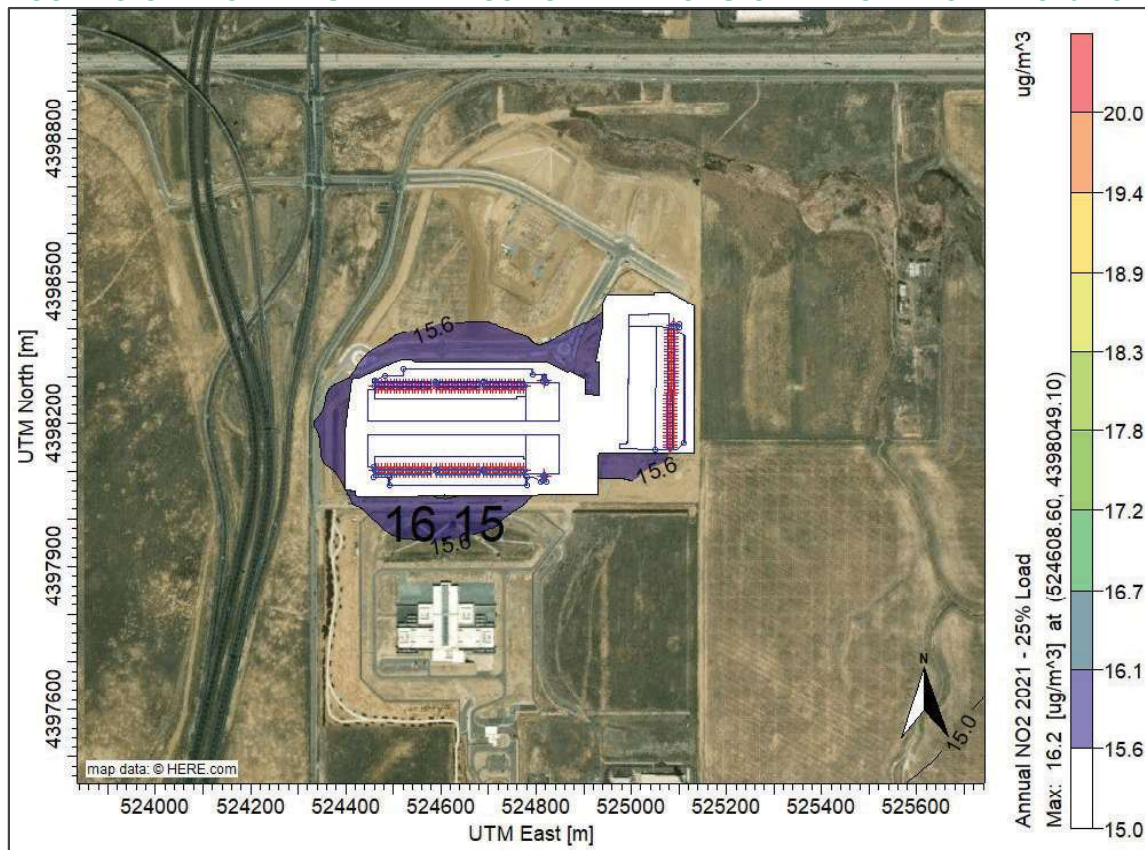


FIGURE 3-6 – MODEL-ESTIMATED CONCENTRATIONS OF ANNUAL NO₂ – 50% LOAD

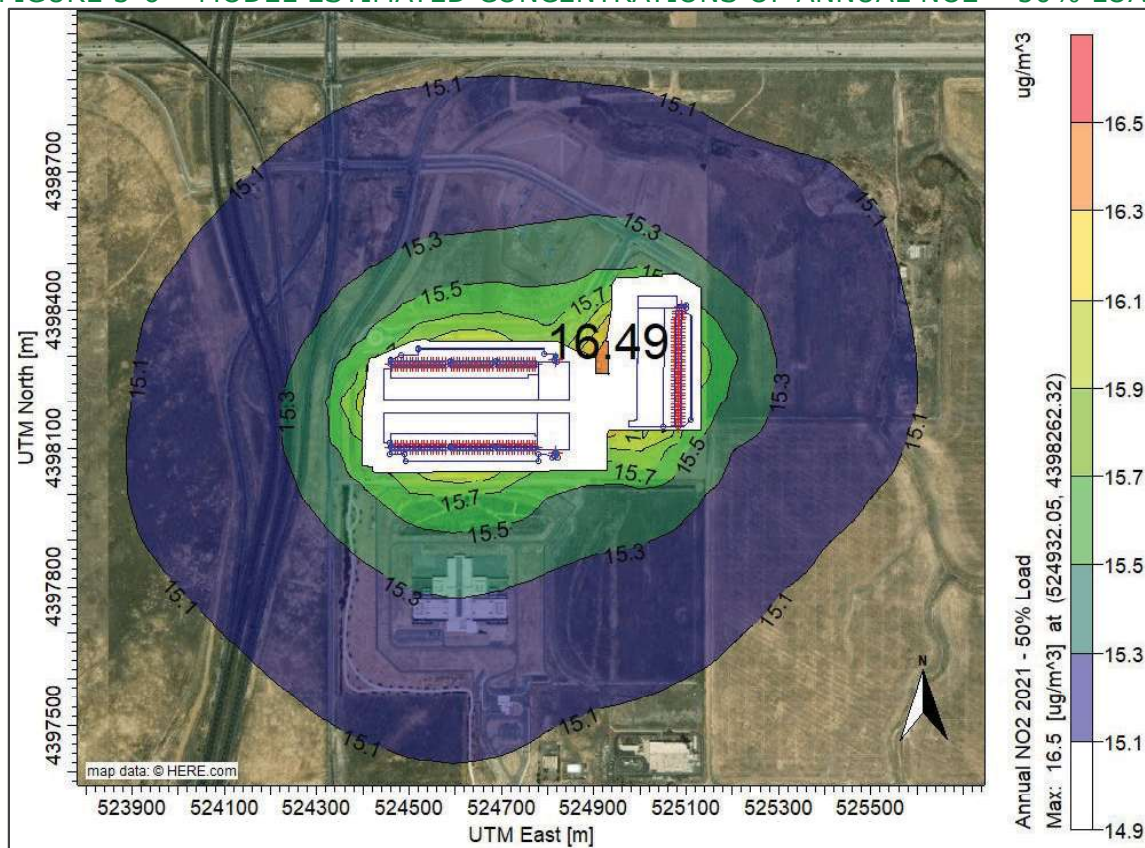


FIGURE 3-7 – MODEL-ESTIMATED CONCENTRATIONS OF ANNUAL NO₂ – 75% LOAD

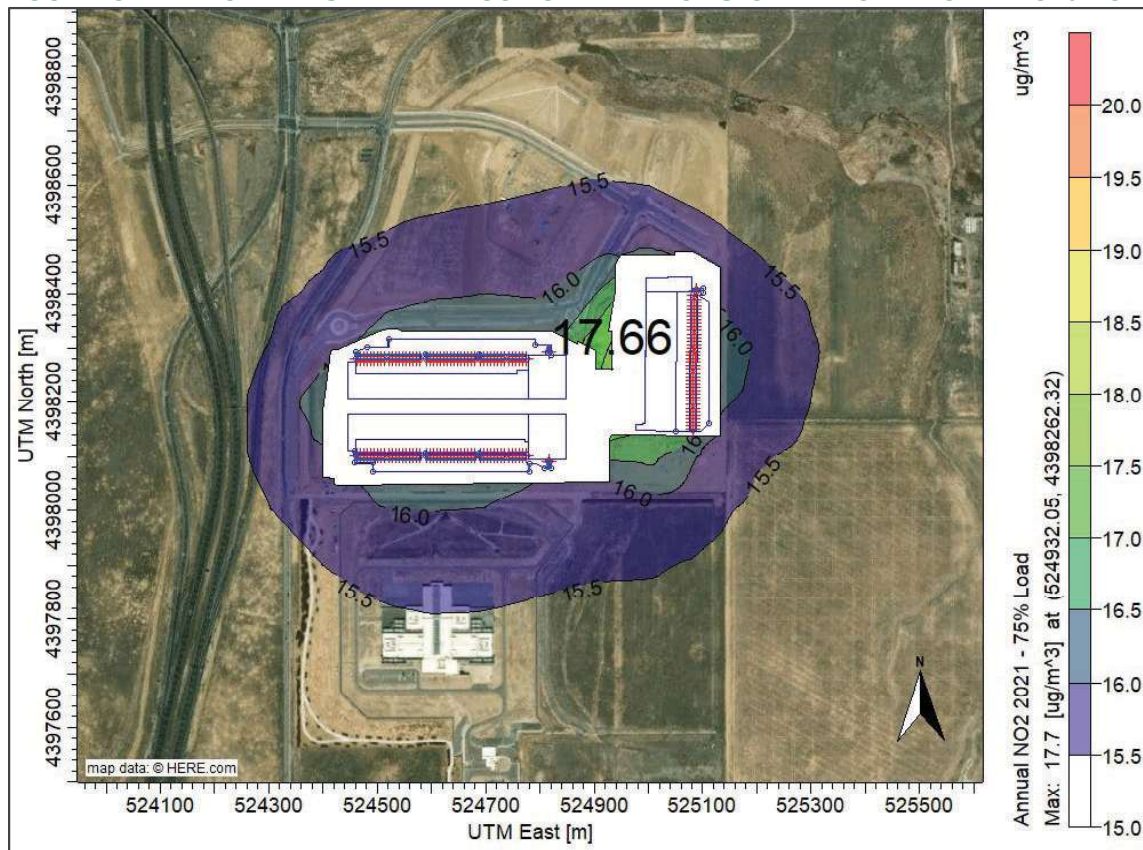
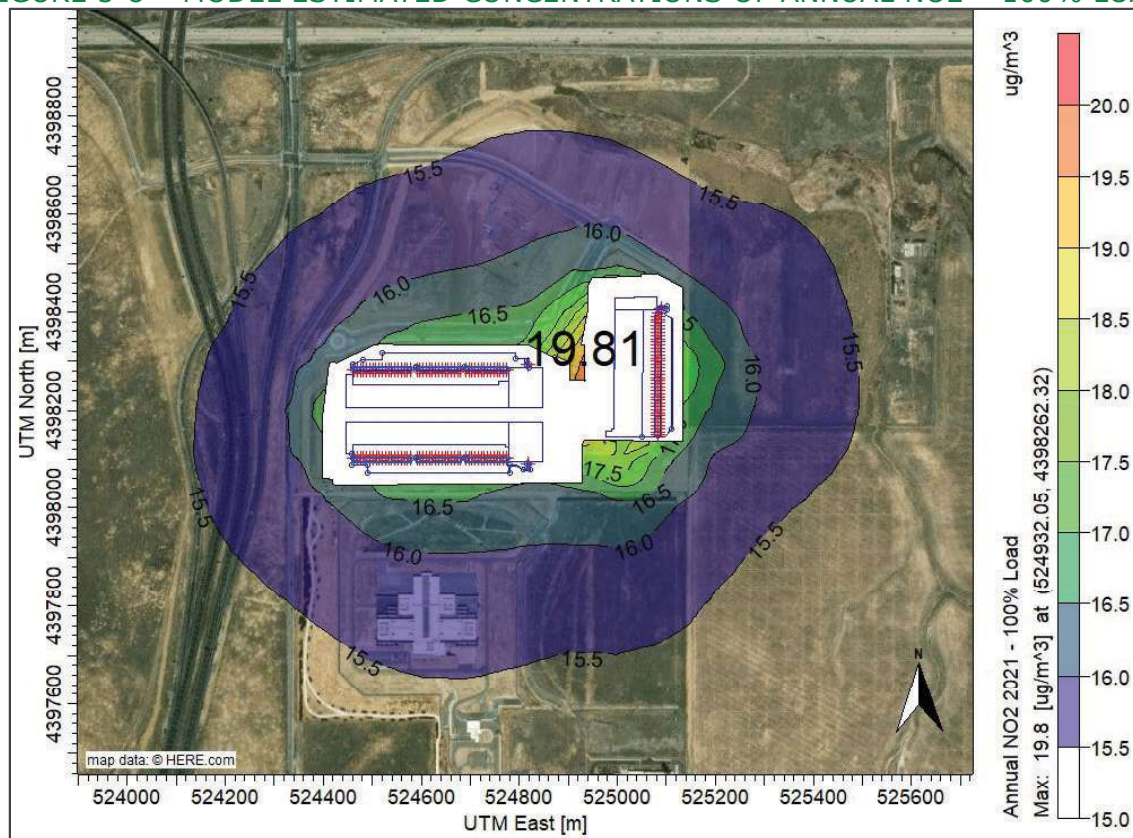


FIGURE 3-8 – MODEL-ESTIMATED CONCENTRATIONS OF ANNUAL NO₂ – 100% LOAD



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FIGURE 3-9 - MODEL-ESTIMATED CONCENTRATION OF 1-HR CO - 25% LOAD

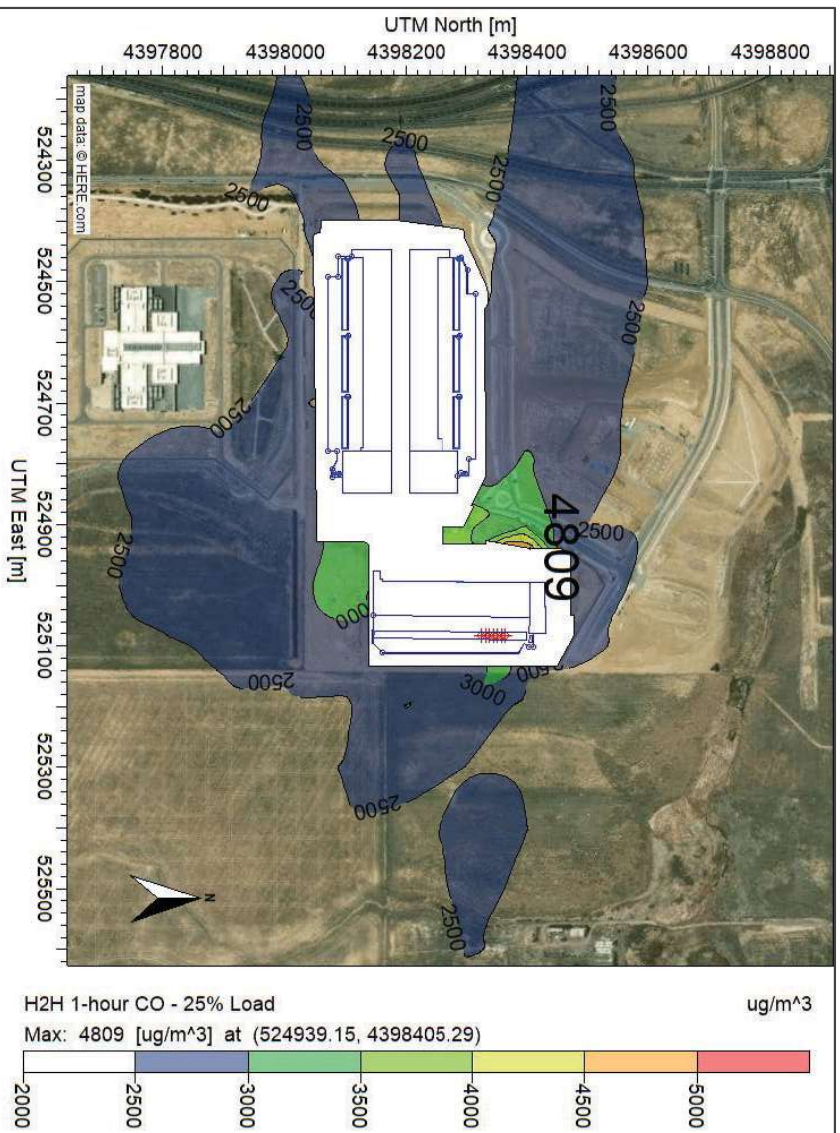


FIGURE 3-10 - MODEL-ESTIMATED CONCENTRATION OF 1-HR CO - 50% LOAD

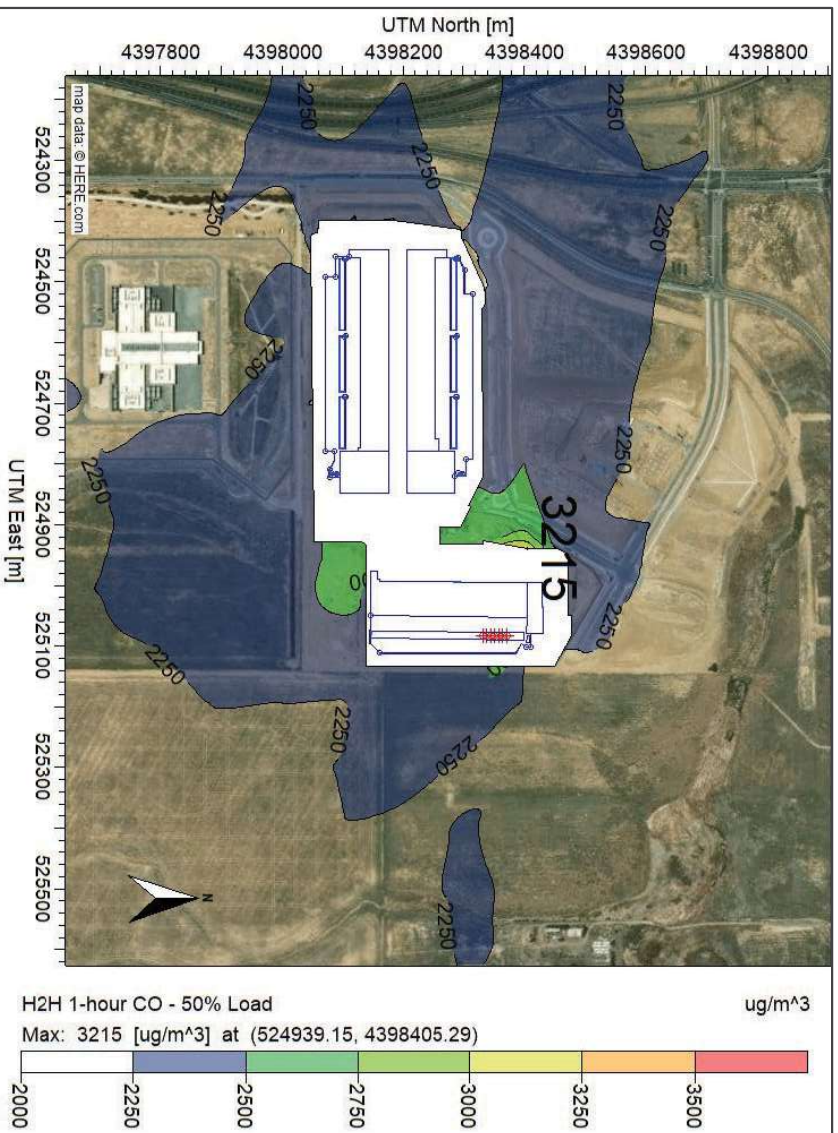


FIGURE 3-11 - MODEL-ESTIMATED CONCENTRATION OF 1-HR CO - 75% LOAD

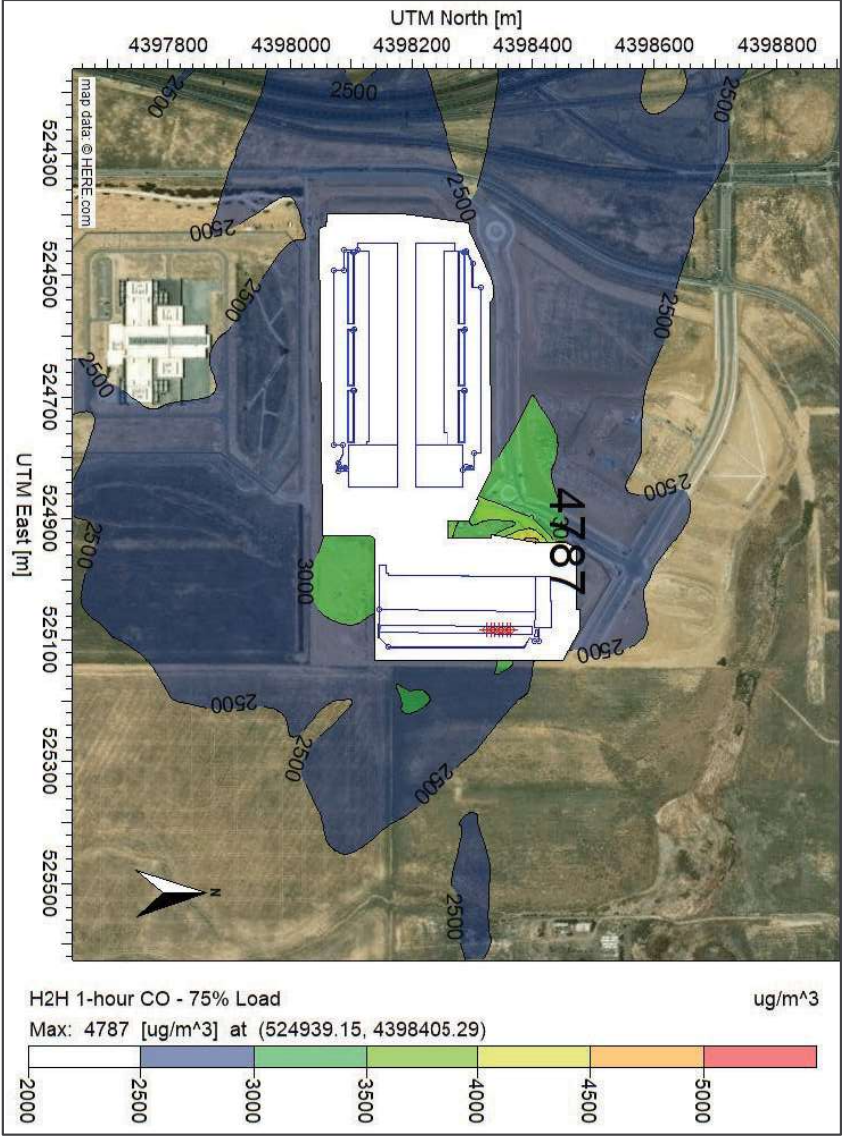


FIGURE 3-12 - MODEL-ESTIMATED CONCENTRATION OF 1-HR CO - 100% LOAD

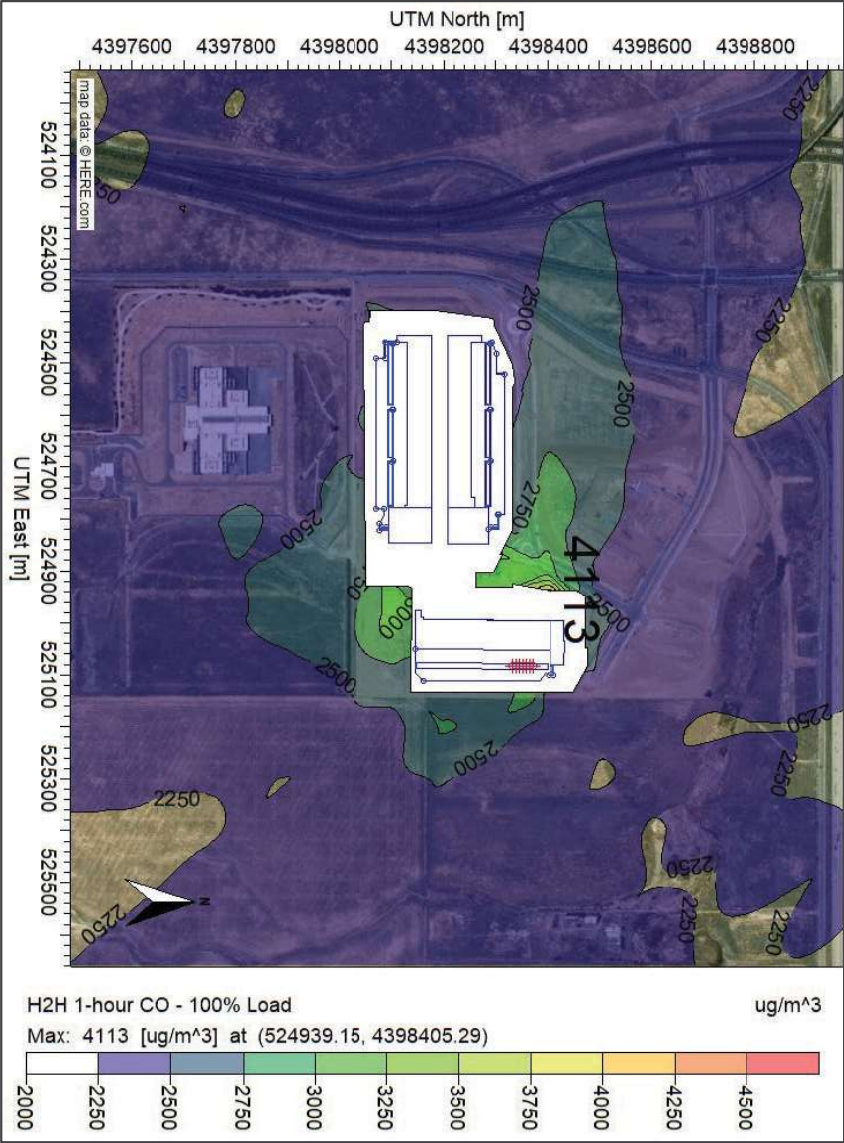


FIGURE 3-13 - MODEL-ESTIMATED CONCENTRATION OF 8-HR CO - 25% LOAD

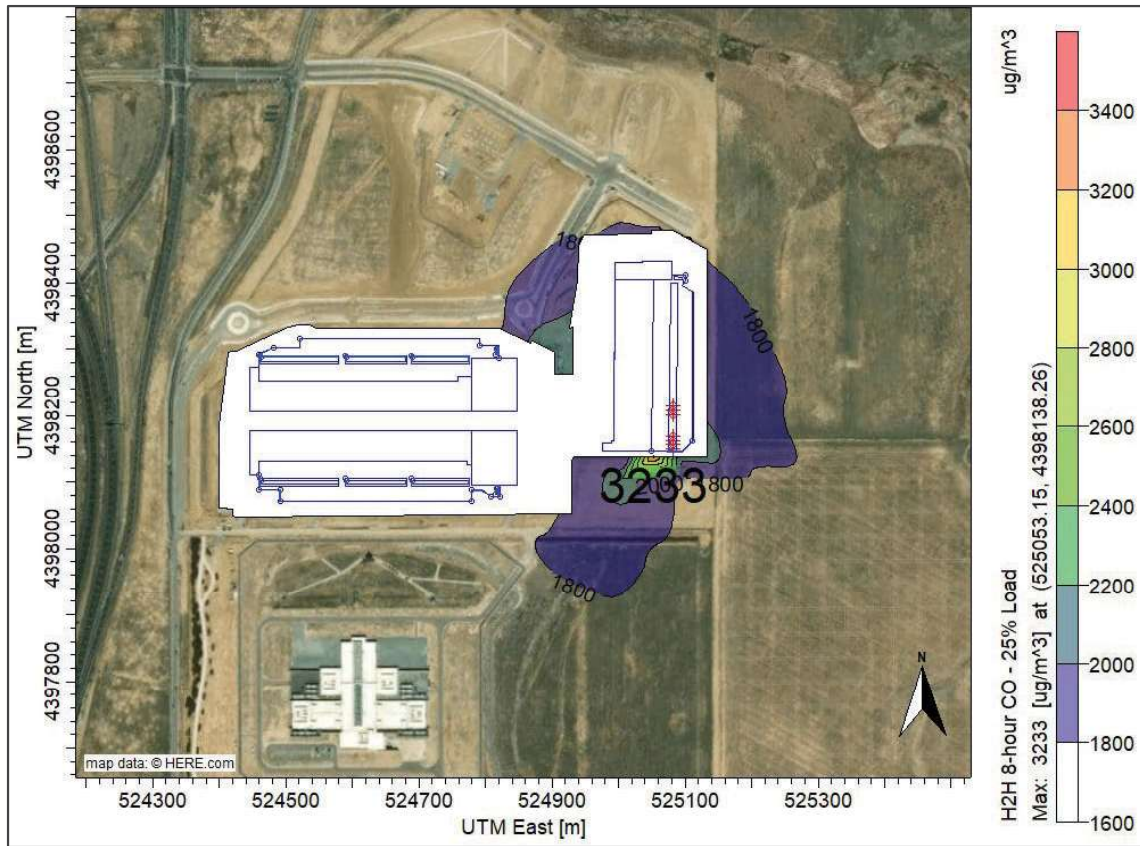


FIGURE 3-14 - MODEL-ESTIMATED CONCENTRATION OF 8-HR CO - 50% LOAD

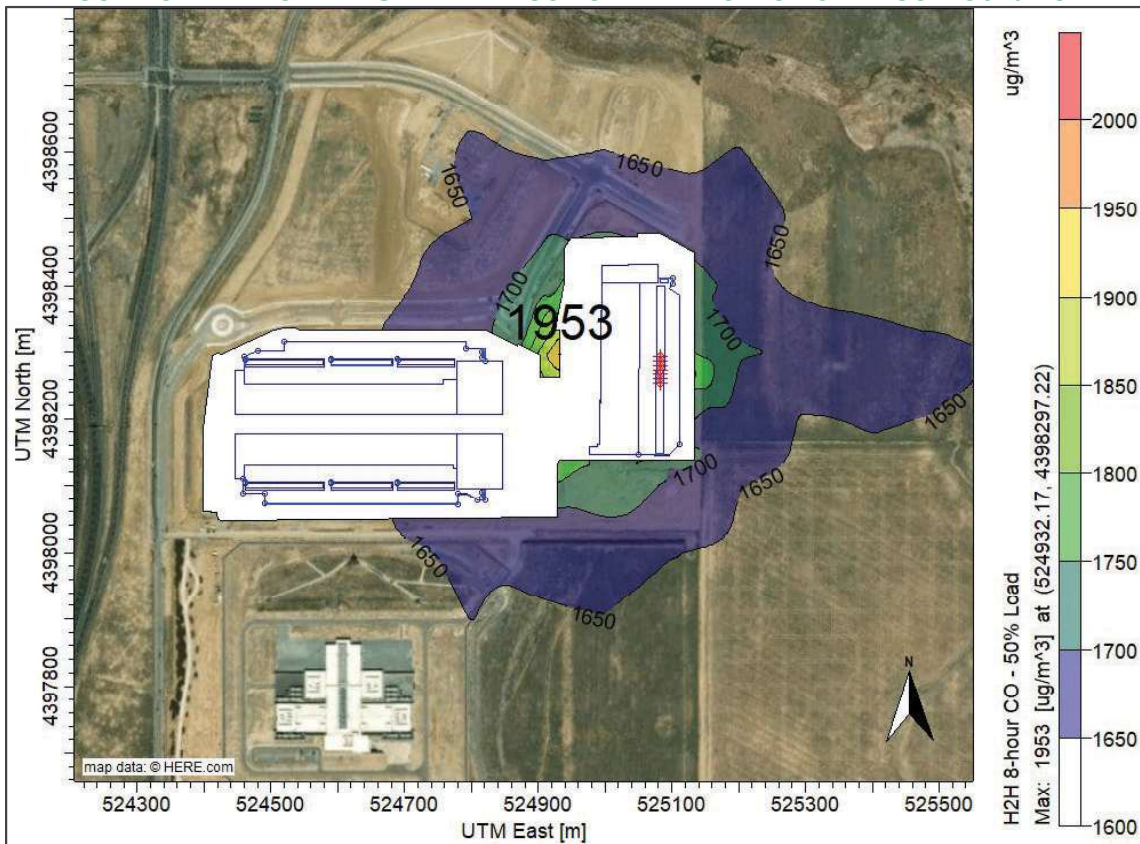


FIGURE 3-15 - MODEL-ESTIMATED CONCENTRATION OF 8-HR CO - 75% LOAD

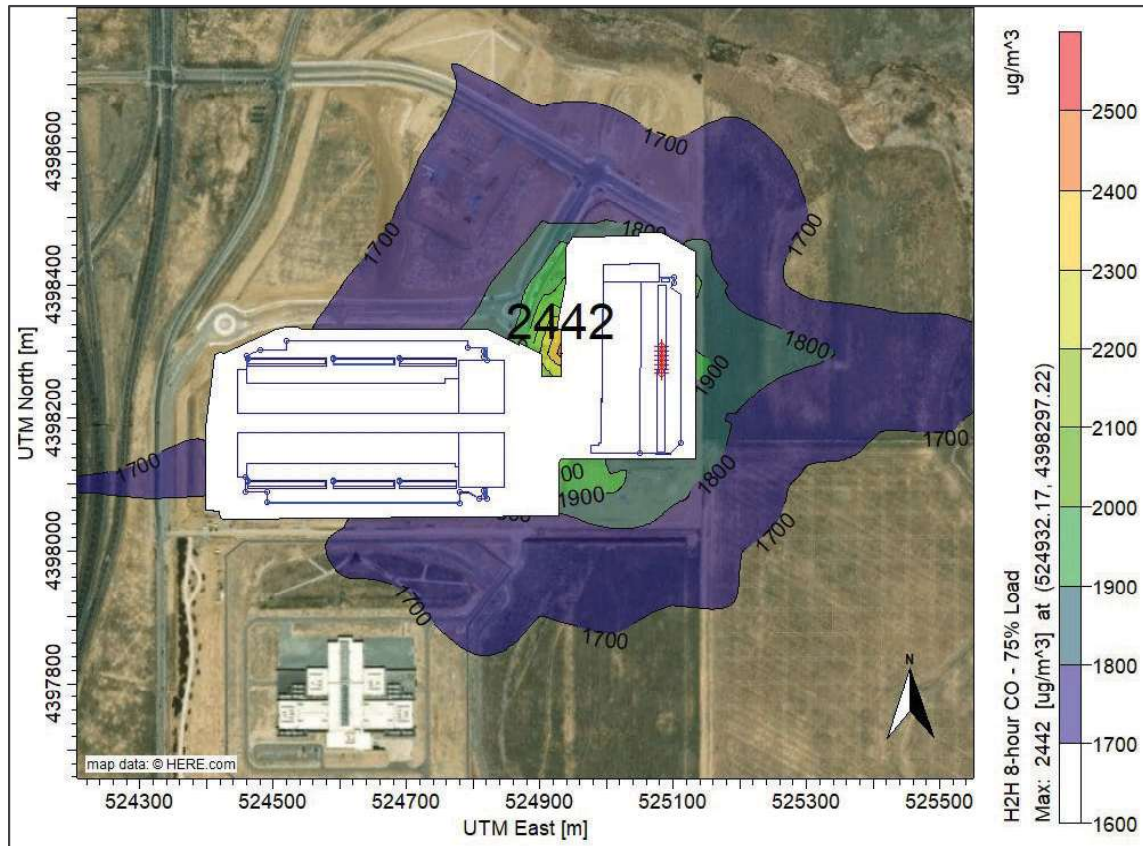


FIGURE 3-16 - MODEL-ESTIMATED CONCENTRATION OF 8-HR CO - 100% LOAD

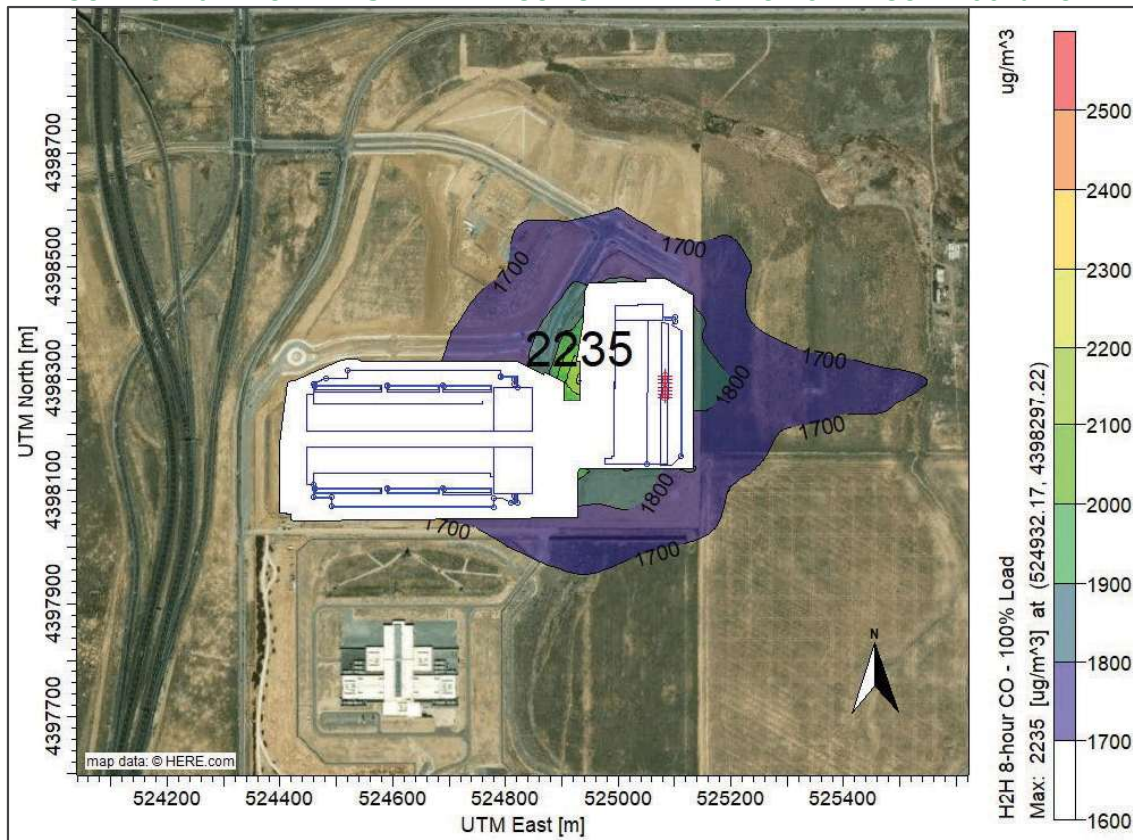


FIGURE 3-17 - MODEL-ESTIMATED CONCENTRATION OF 1-HR SO₂ - 25% LOAD

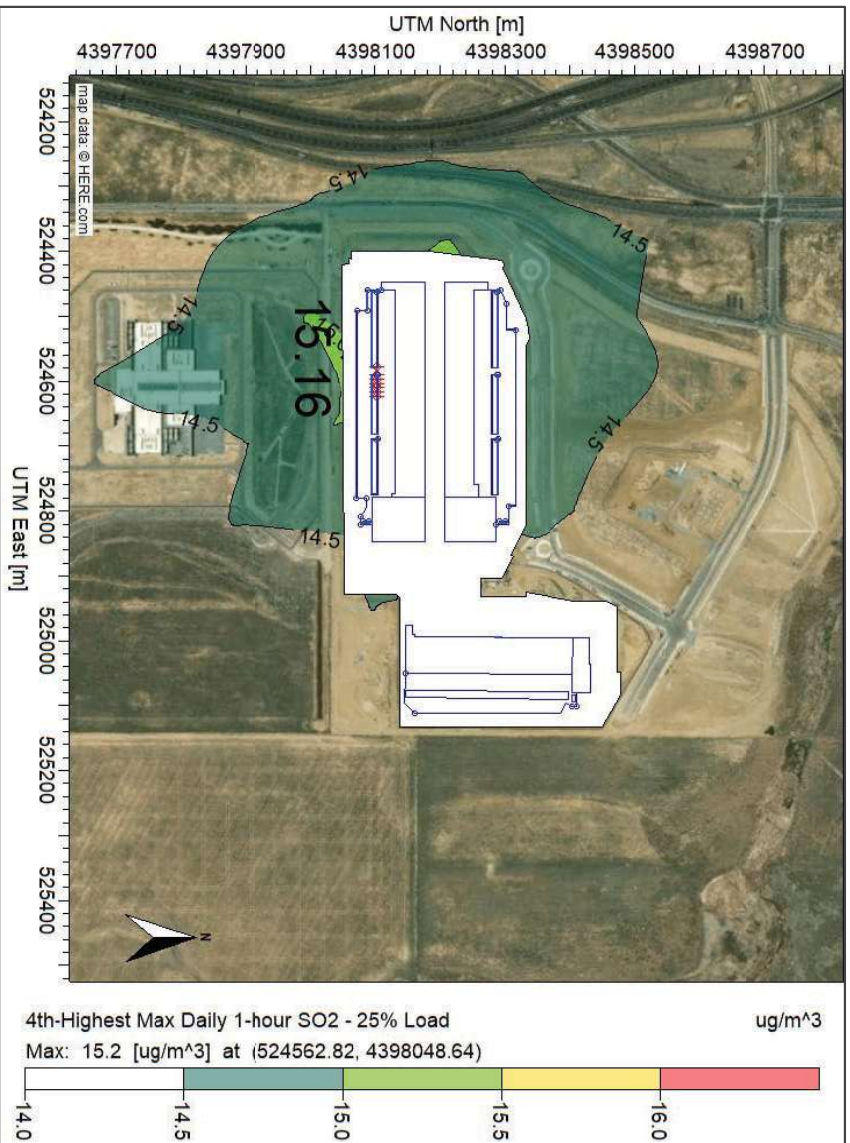


FIGURE 3-18 - MODEL-ESTIMATED CONCENTRATION OF 1-HR SO₂ - 50% LOAD

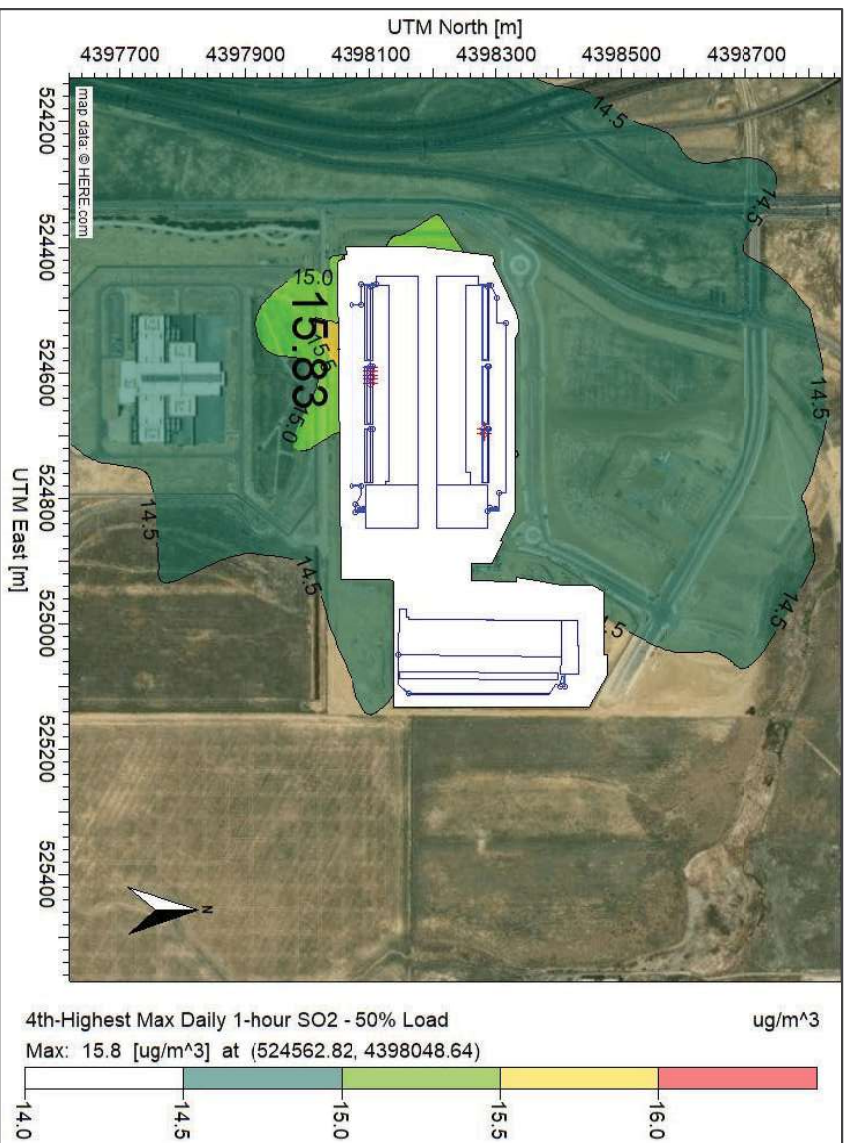


FIGURE 3-19 - MODEL-ESTIMATED CONCENTRATION OF 1-HR SO₂ - 75% LOAD

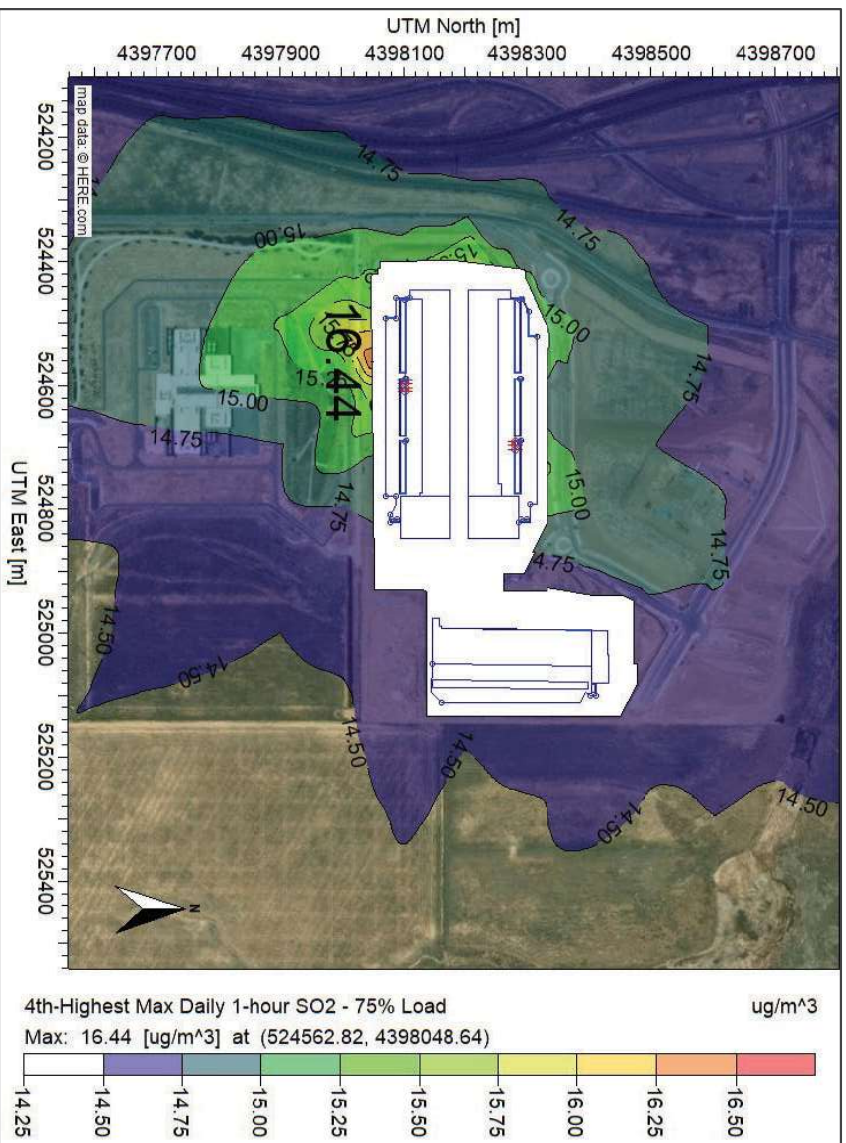
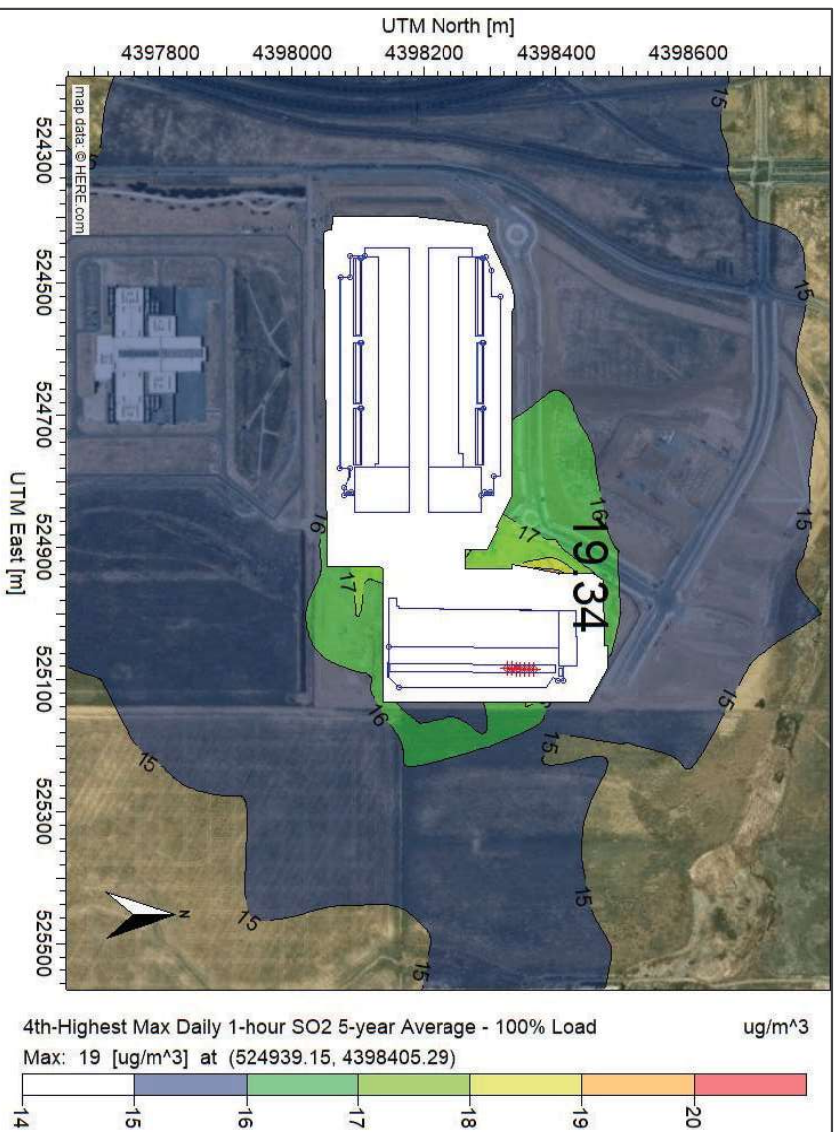


FIGURE 3-20 - MODEL-ESTIMATED CONCENTRATION OF 1-HR SO₂ - 100% LOAD



This map displays the spatial distribution of H2H 3-hour SO₂ - 25% Load concentration. The map is overlaid on an aerial photograph of the facility and surrounding area. The concentration is represented by a color-coded overlay, with a maximum value of 13.54 $\mu\text{g}/\text{m}^3$ at the location (524590.64, 4398331.90). The map includes UTM North [m] and UTM East [m] coordinates, a north arrow, and a scale bar. The concentration values are shown in a color scale from 12.25 to 14.00 $\mu\text{g}/\text{m}^3$.

This map displays the spatial distribution of H2H 3-hour SO₂ - 50% Load concentration. The map is overlaid on a satellite image of the H2H facility and surrounding area. The facility is shown as a large white building complex. The concentration is represented by a color scale ranging from 12.25 to 14.50 ug/m³. The highest concentration (14.22 ug/m³) is located near the facility. The map includes UTM North [m] and UTM East [m] coordinates. A north arrow is present in the bottom right corner. The map data is attributed to HERE.com.

UTM North [m]

UTM East [m]

map data: © HERE.com

H2H 3-hour SO₂ - 50% Load

Max: 14.22 [ug/m³] at (524590.64, 4398331.90)

ug/m³

14.50

14.25

14.00

13.75

13.50

13.25

13.00

12.75

12.50

12.25

FIGURE 3-23 - MODEL-ESTIMATED CONCENTRATION OF 3-HR SO₂ - 75% LOAD

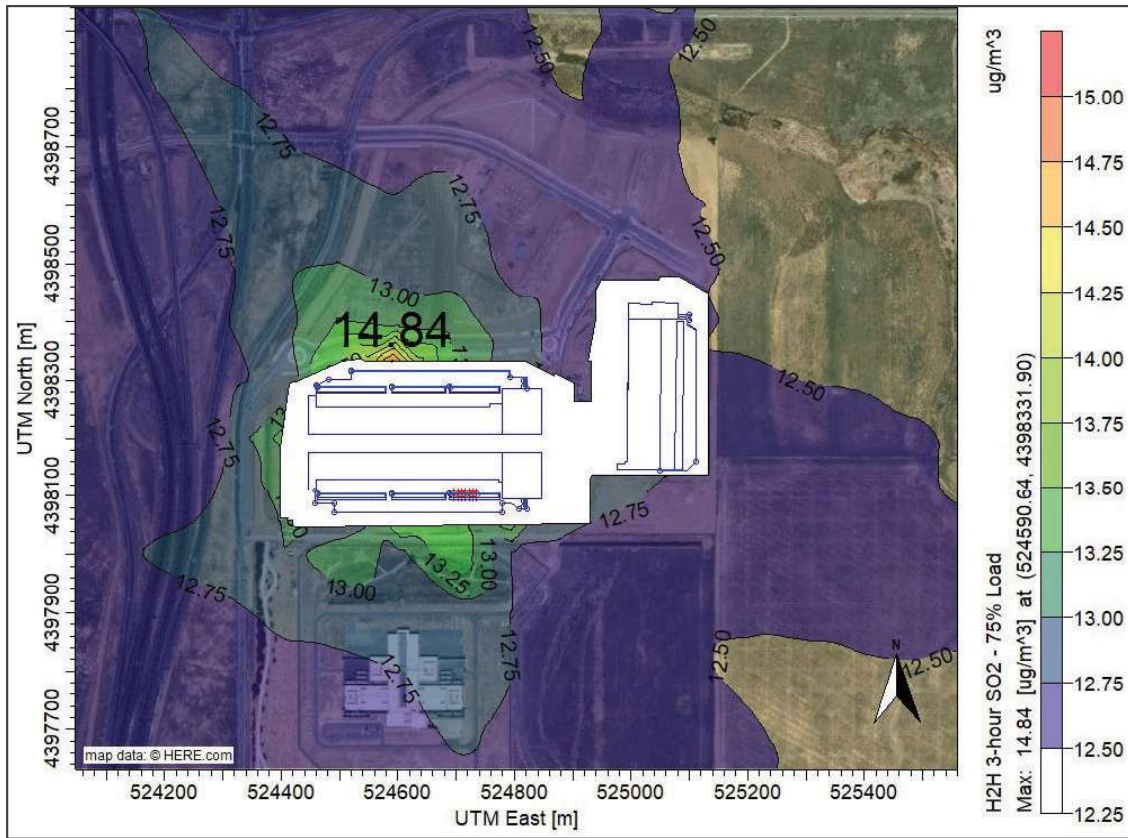
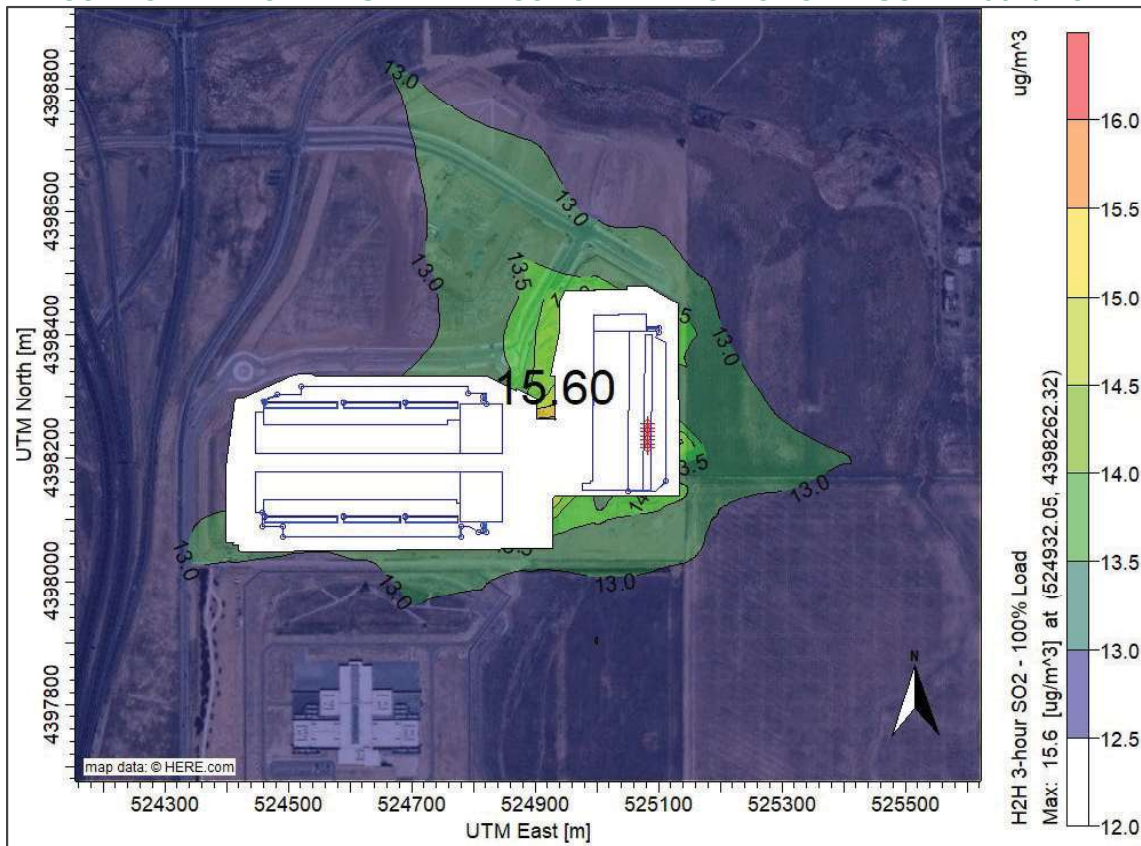


FIGURE 3-24 - MODEL-ESTIMATED CONCENTRATION OF 3-HR SO₂ - 100% LOAD



UTM North [m]

4397700 4397900 4398100 4398300 4398500 4398700

524200 524400 524600 524800 525000 525200 525400

UTM East [m]

map data © HERE.com

50.0 50.0 50.0 50.0 50.0 50.0 50.0 50.0 50.0 50.0

51.5 51.5 51.5 51.5 51.5 51.5 51.5 51.5 51.5 51.5

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62.0 62.0 62.0 62.0 62.0 62.0 62.0 62.0 62.0 62.0

63.5 63.5 63.5 63.5 63.5 63.5 63.5 63.5 63.5 63.5

65.0 65.0 65.0 65.0 65.0 65.0 65.0 65.0 65.0 65.0

63.3 29

H6H 24-hour PM10 - 25% Load

Max: 63.3 [$\mu\text{g}/\text{m}^3$] at (524932.17, 4398297.22)

$\mu\text{g}/\text{m}^3$

UTM North [m]

4397700 4397900 4398100 4398300 4398500 4398700

map data © HERE.com

524300 524500 524700 524900 525100 525300 525500

UTM East [m]

58.48

H6H 24-hour PM10 - 50% Load

Max: 58 [ug/m³] at (524932.17, 4398297.22)

50 51 52 53 54 55 56 57 58 59 60

ug/m³

FIGURE 3-27 – MODEL-ESTIMATED CONCENTRATIONS OF 24-HOUR PM10 – 75% LOAD

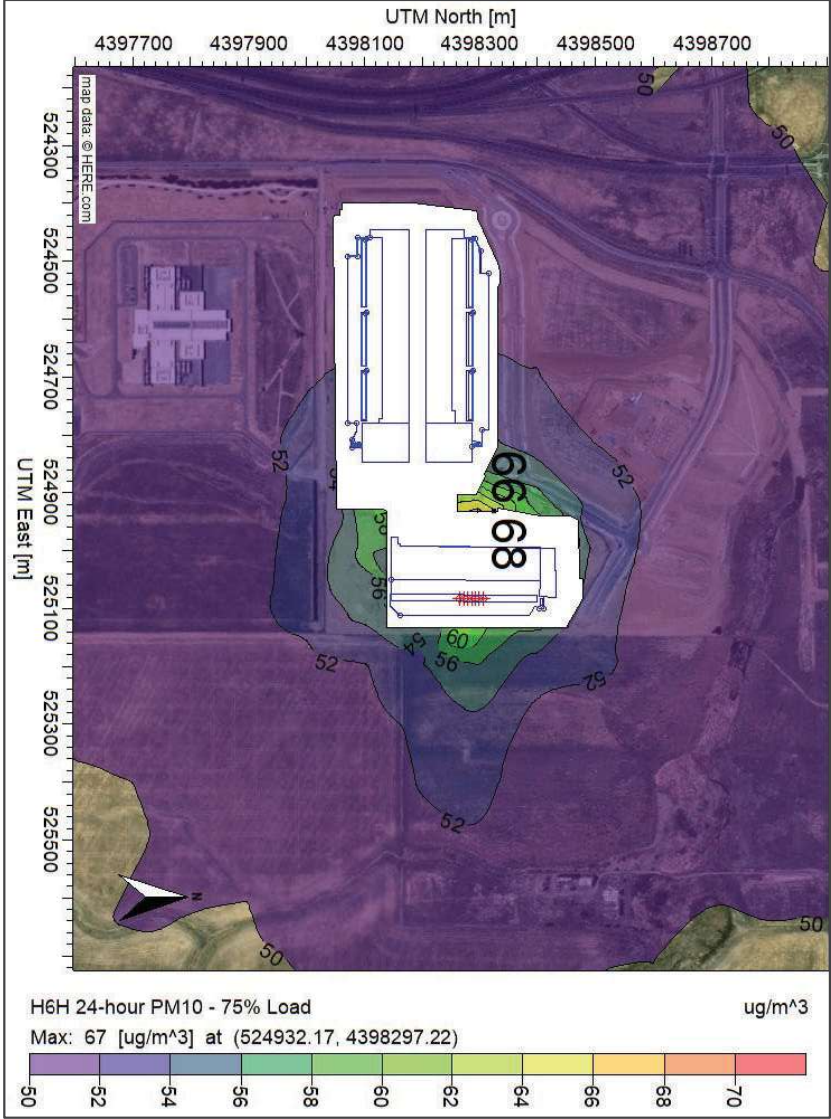


FIGURE 3-28 – MODEL-ESTIMATED CONCENTRATIONS OF 24-HOUR PM10 – 100% LOAD

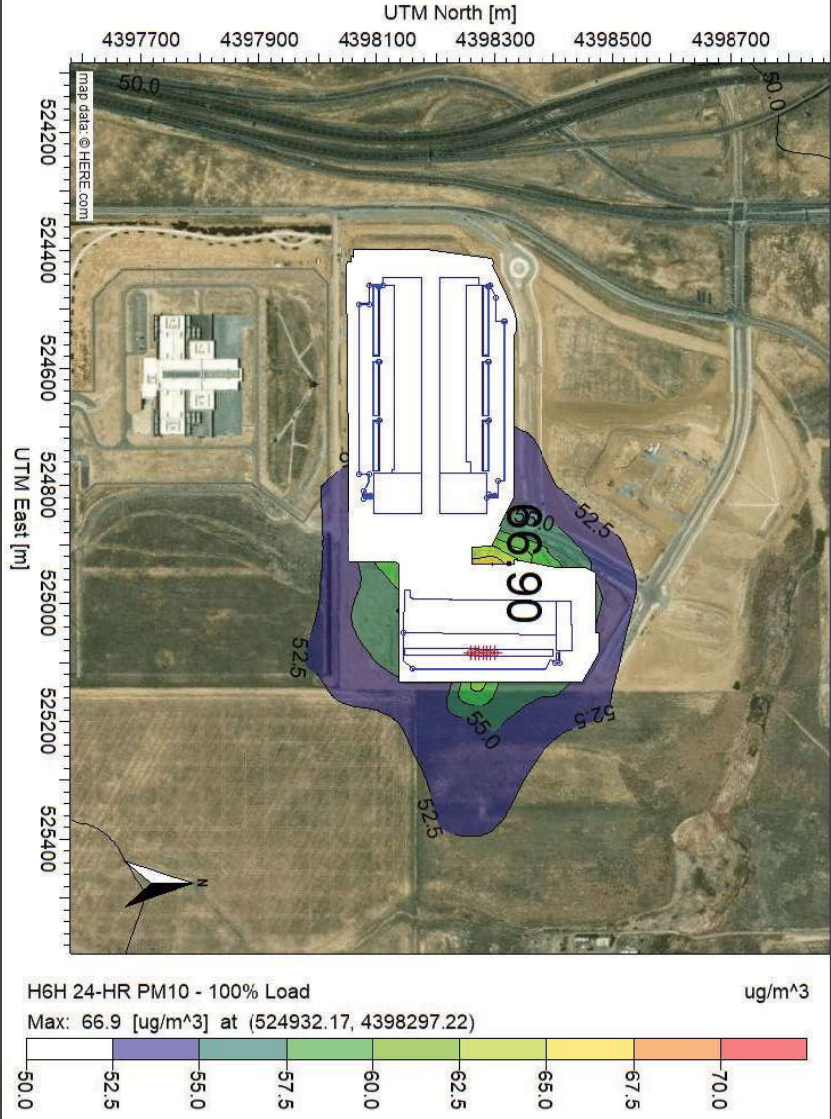


FIGURE 3-29 – MODEL-ESTIMATED CONCENTRATIONS OF 24-HOUR PM2.5 – 25% LOAD

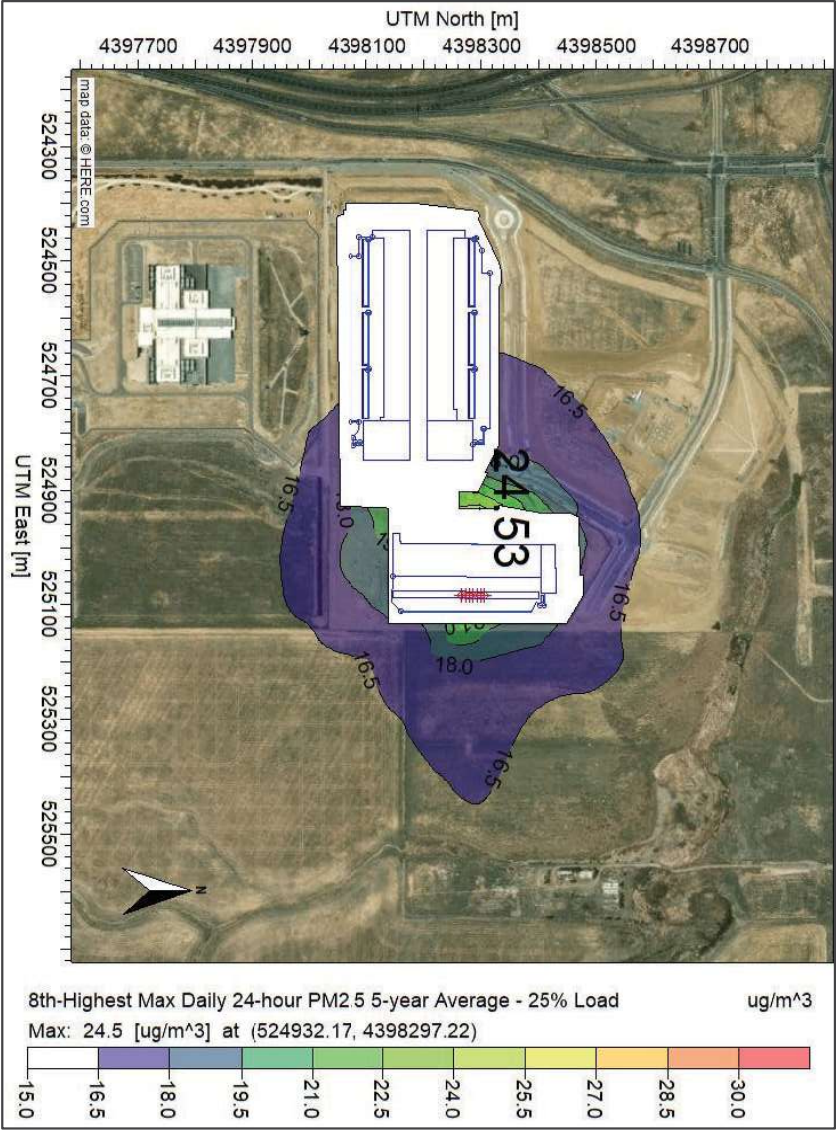


FIGURE 3-30 – MODEL-ESTIMATED CONCENTRATIONS OF 24-HOUR PM2.5 – 50% LOAD

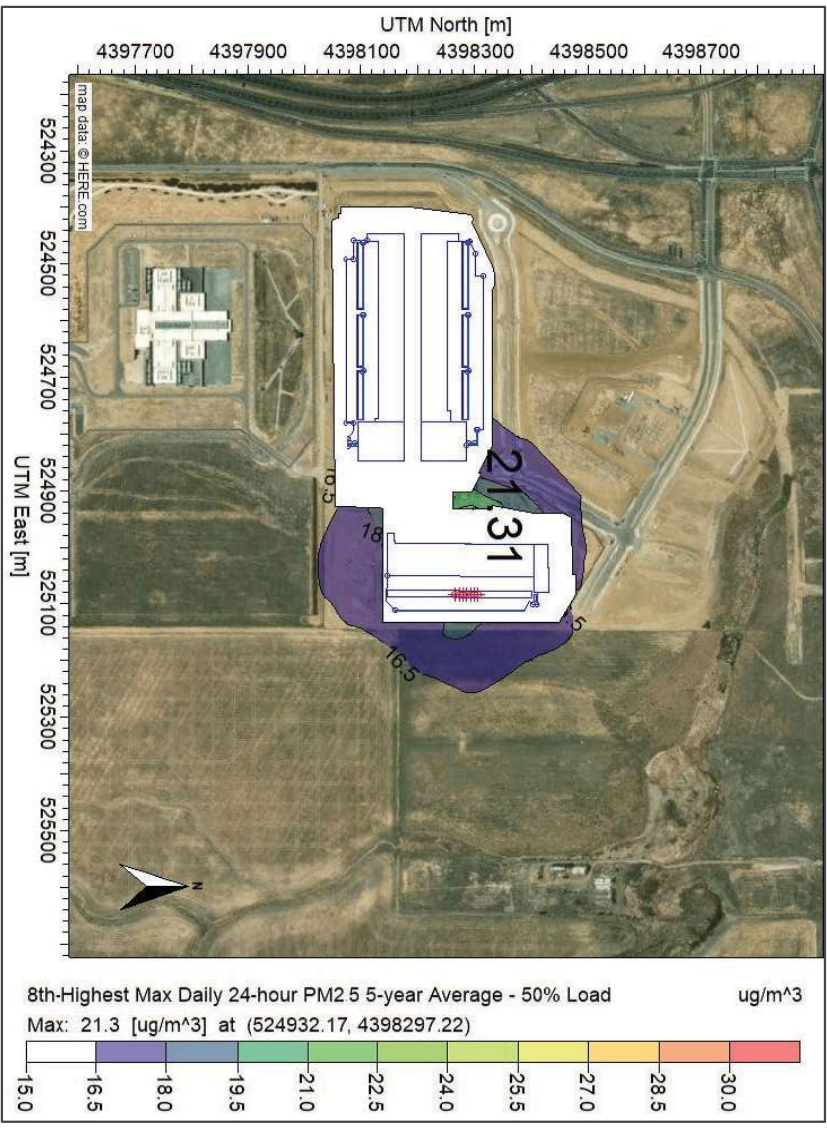


FIGURE 3-31 – MODEL-ESTIMATED CONCENTRATIONS OF 24-HOUR PM_{2.5} – 75% LOAD

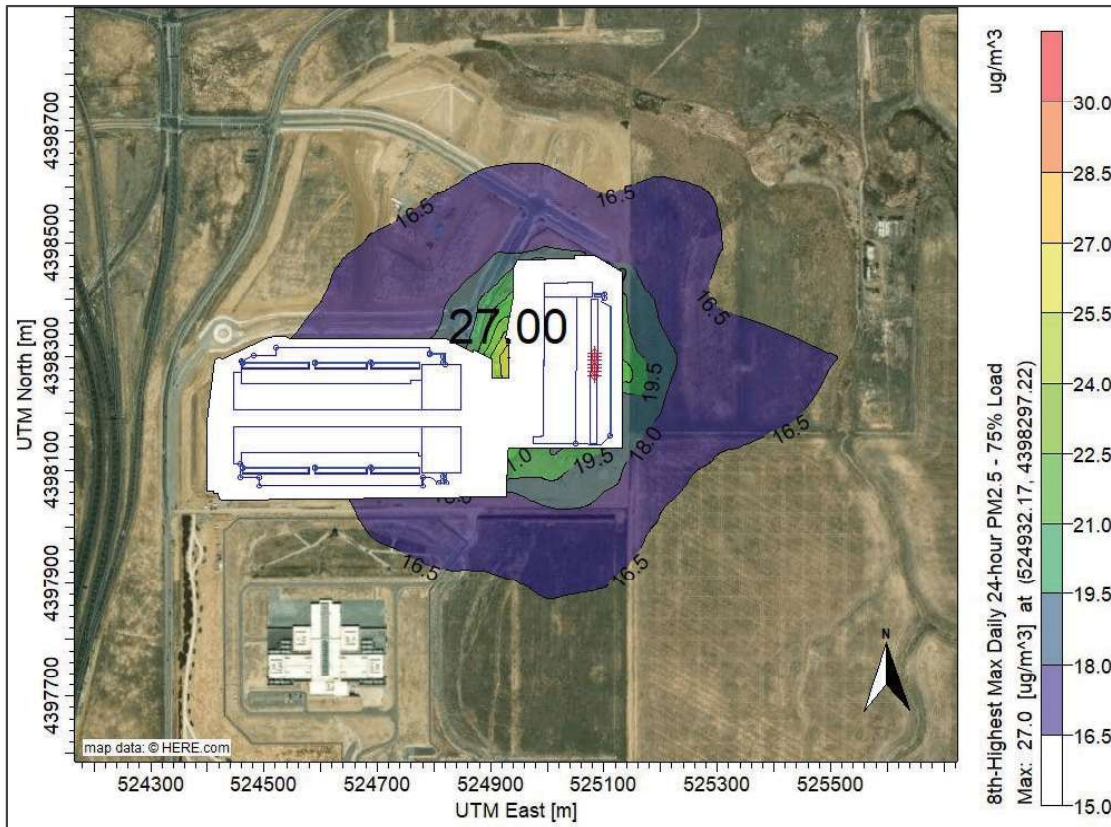


FIGURE 3-32 – MODEL-ESTIMATED CONCENTRATIONS OF 24-HOUR PM_{2.5} – 100% LOAD

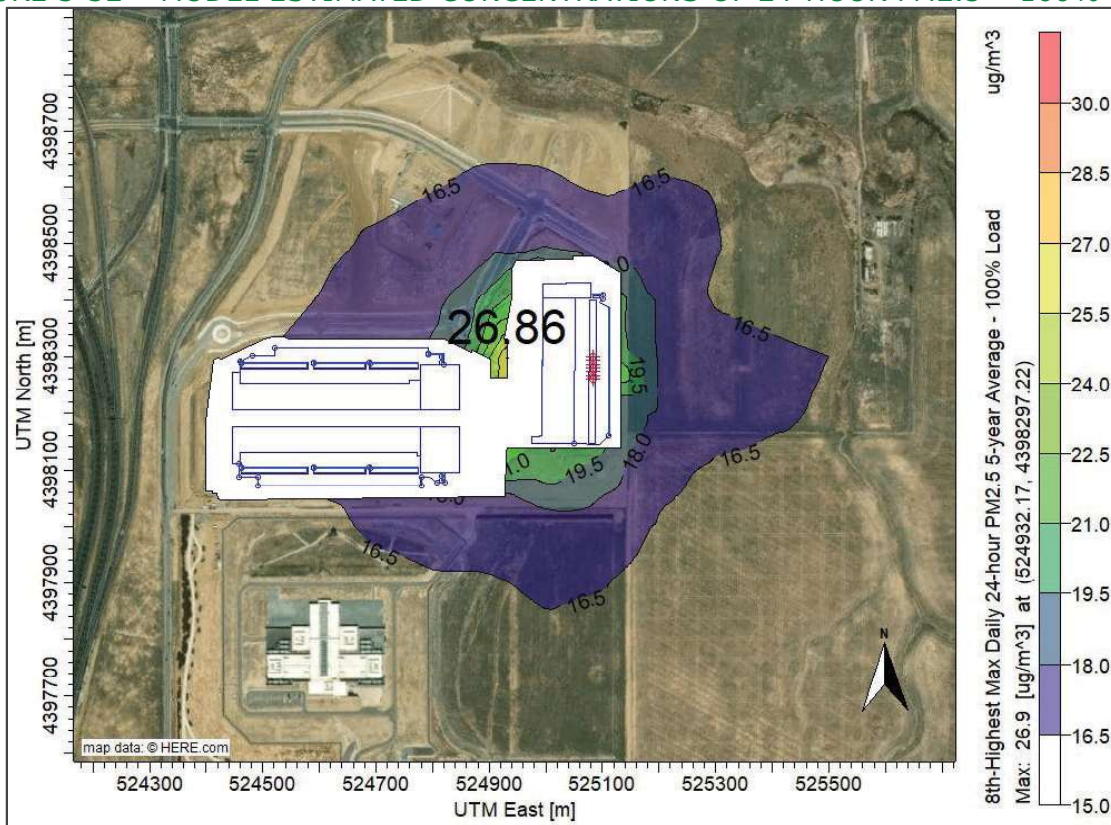


FIGURE 3-33 – MODEL-ESTIMATED CONCENTRATIONS OF ANNUAL PM2.5 – 25% LOAD

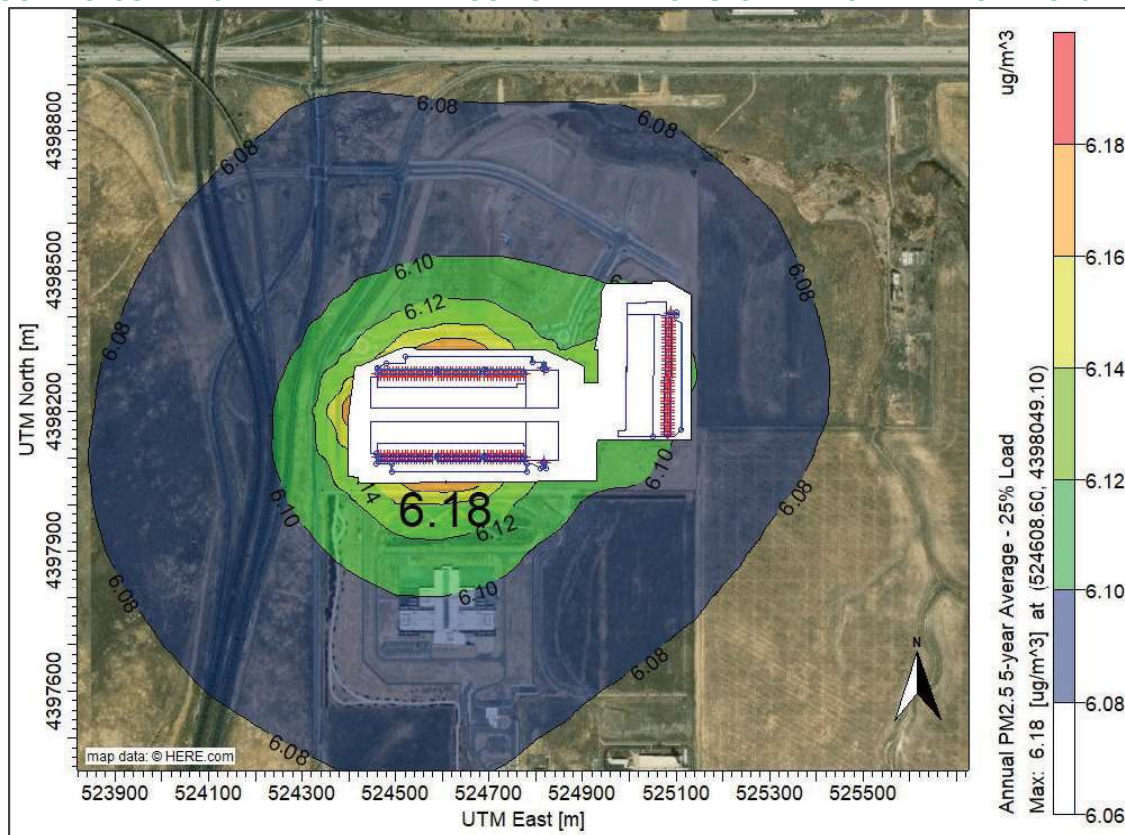


FIGURE 3-34 – MODEL-ESTIMATED CONCENTRATIONS OF ANNUAL PM2.5 – 50% LOAD

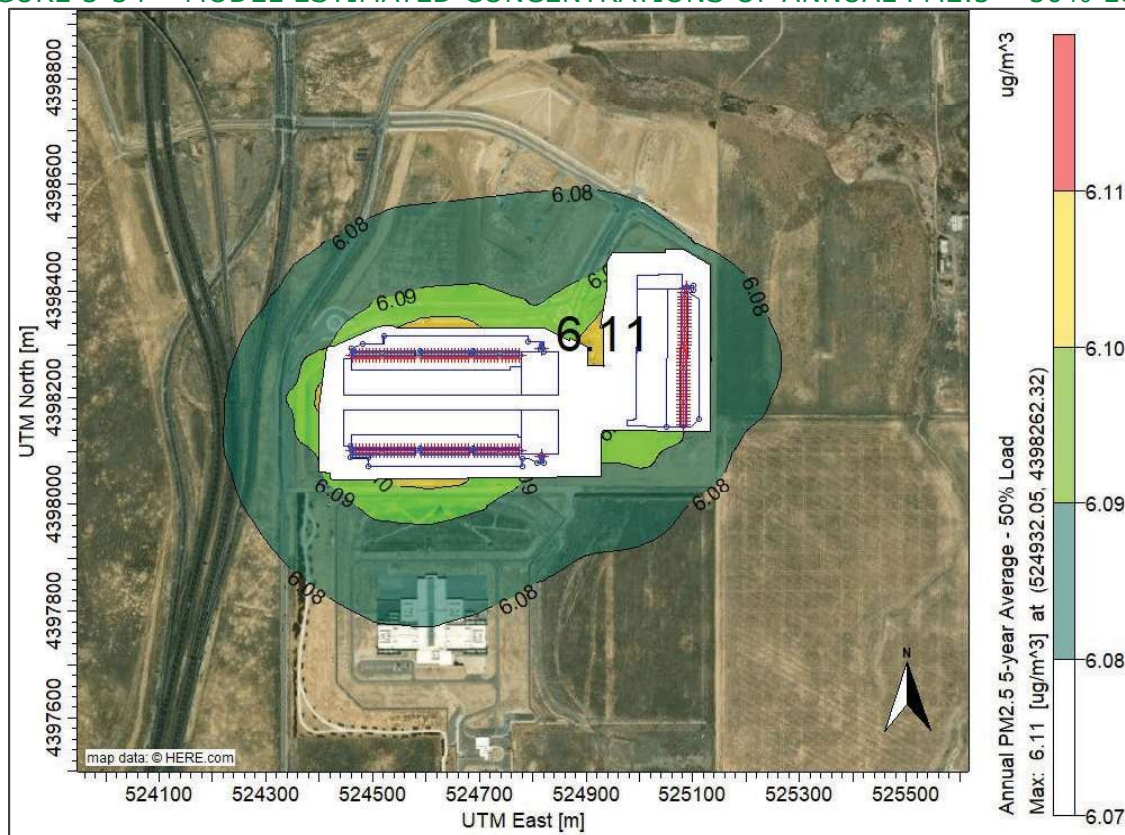


FIGURE 3-35 – MODEL-ESTIMATED CONCENTRATIONS OF ANNUAL PM2.5 – 75% LOAD

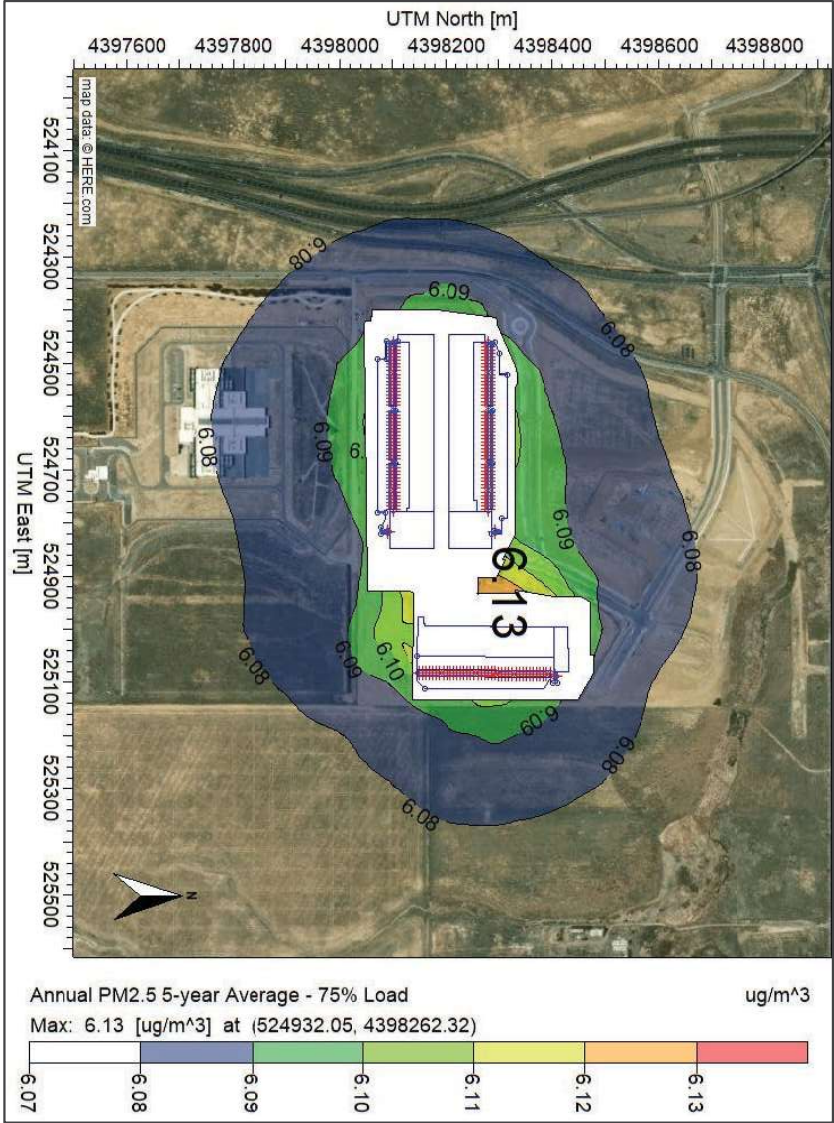
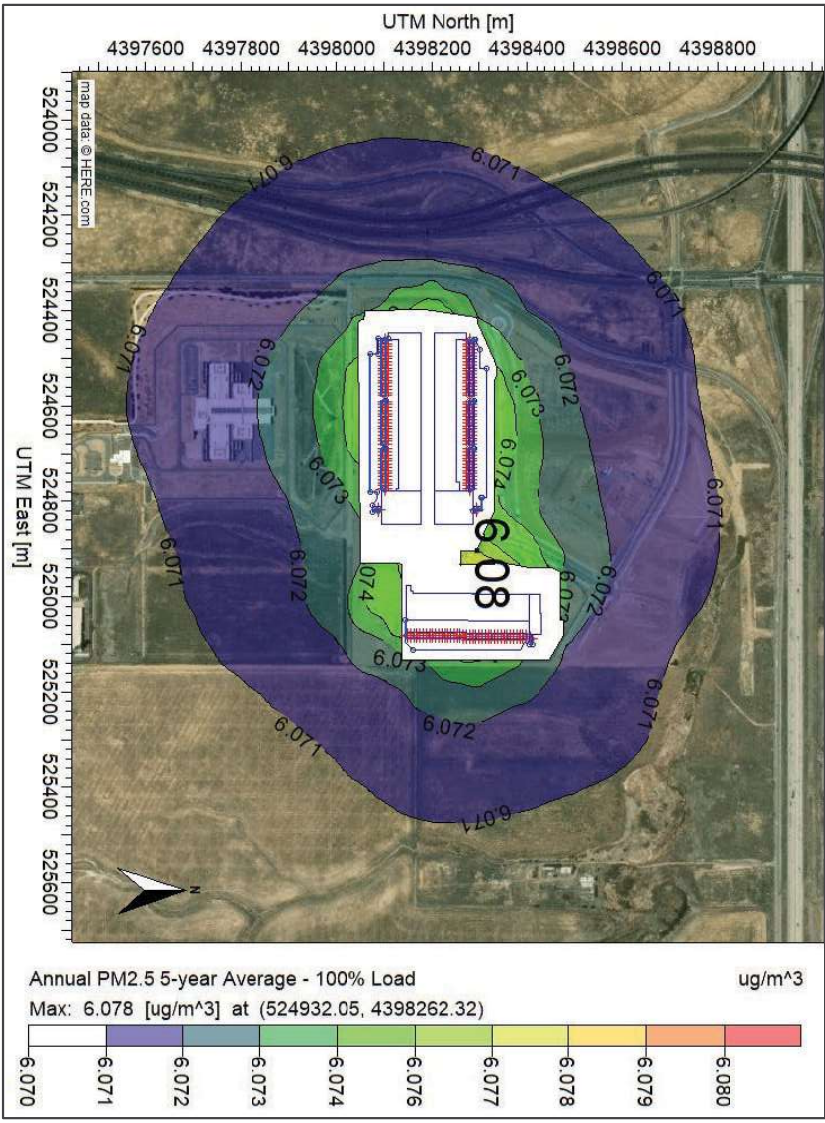


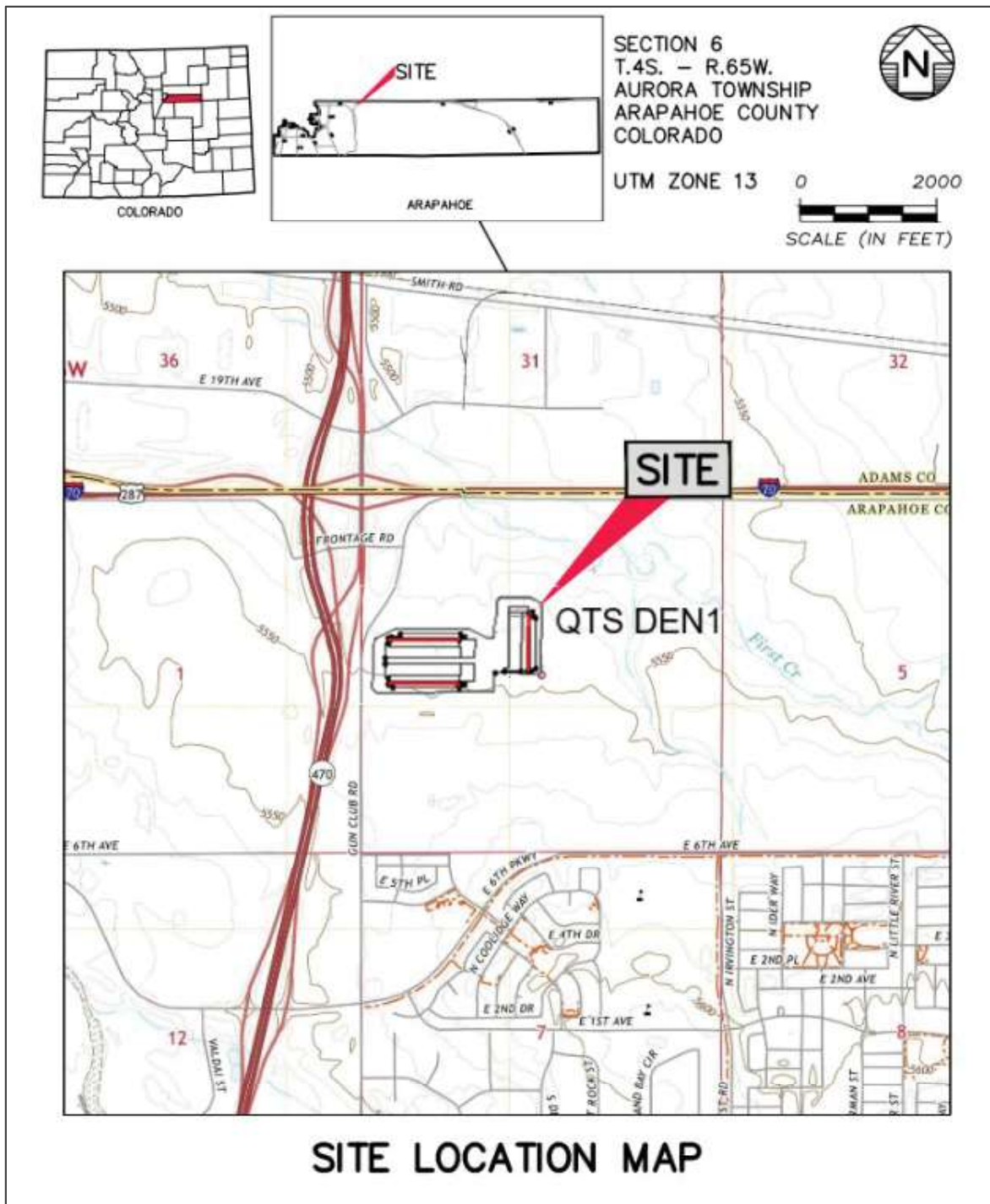
FIGURE 3-36 – MODEL-ESTIMATED CONCENTRATIONS OF ANNUAL PM2.5 – 100% LOAD

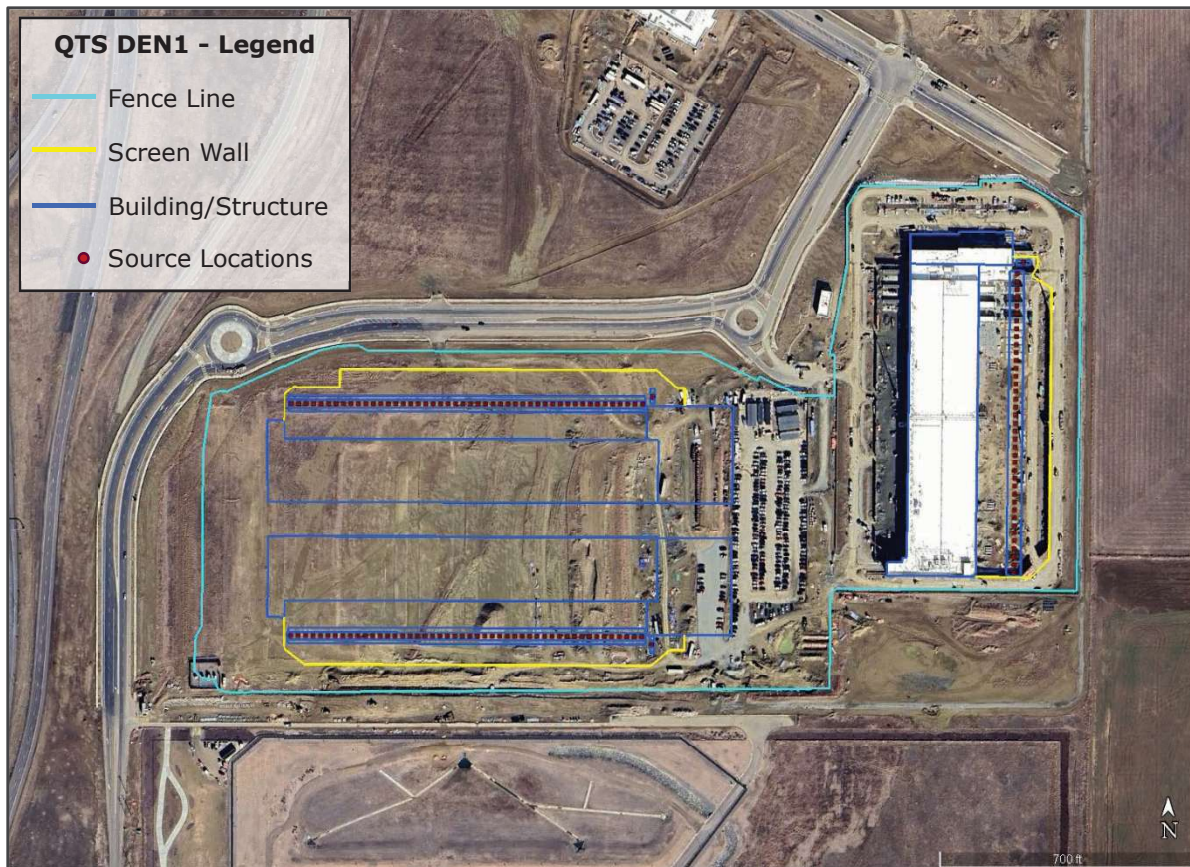




APPENDIX A SITE MAPS

1:24,000-SCALE TOPOGRAPHIC SITE LOCATION AND LAYOUT MAPS







APPENDIX B COMMUNICATION AND DATA PROVIDED BY CDPHE

METEOROLOGICAL DATA DETERMINATION

BACKGROUND CONCENTRATION LETTER

SEASONAL HOURLY BACKGROUND PROFILES

NO₂/NO_x ISR ANALYSIS

Ashley Kung

From: andrew.white@state.co.us on behalf of APCD Modeling Files - CDPHE , CDPHE
<cdphe_apcd_modeling_files@state.co.us>
Sent: Wednesday, April 9, 2025 12:40 PM
To: Ashley Kung
Cc: Bennett Wildey; Daniel Guido; Meghan Tracy-Burford; Tiffany Cuni
Subject: Re: QTS DEN1 - Background Concentrations and Met Data Request
Attachments: DIA_17-21_v24142.zip; QTSDEN1_BackgroundLetter_April2025.pdf; LaCasa-2021-2023-Seasonal_Hourly_NO2_Background_Concentration_Profile.pdf; AuroraEast_2021-2023_Seasonal_Hourly_O3_Background_concentration_Profile.pdf

Follow Up Flag: Follow up
Flag Status: Completed

WARNING: The sender of this email could not be validated and may not match the person in the "From" field.

EXTERNAL MESSAGE

Good Morning Ashley,

Please see attached files and acknowledge receipt of this email.

Meteorological Data

The Division has completed the AERMOD meteorological determination for: **QTS Aurora, LLC - QTS DEN1**
Approximate Location: 39.73341, -104.71110 (Lat/Long, NAD83)

The Division has determined that surface meteorology from [Denver International Airport \(DIA\)](#) data processed with Denver upper air is adequately representative of dispersion conditions at the site. Please see attached meteorological data processed with and without ADJ_U* using AERMET version 24142.

SURFACE METEOROLOGY

Met Site: [DIA](#)

Tower LAT/LONG: 39.867N, 104.667W
Tower type: ASOS
Data type: 1-min-site-specific
Profile Base Elevation: 1656 m
Data period: 2017-2021
Data availability: attached

UPPER AIR METEOROLOGY

Site: KDEN (Denver, CO)
WBAN number: 23062
Data type: Radiosonde
Site LAT/LONG: 39.77N, 104.88W
Collected by: National Weather Service (NWS)
Data format: NOAA Forecast Systems Laboratory (fsl) format
Data availability: attached

Background Concentration Data

Attached is the background concentrations letter and the seasonal hourly background profiles for NO₂ and O₃.

Below are seasonal PM_{2.5} concentrations (ug/m³) from the 2021-2023 La Casa monitor for 24-hour PM_{2.5} modeling:

Season 1 14.9
Season 2 13.1
Season 3 14.5
Season 4 15.1

This determination is not applicable for an unlimited period and may expire if there is a substantial delay between the date of this determination and the submittal of the permit application, generally around one year after receiving the DMU response with files. If the location of the source moves or if additional modeling is warranted in the future at this site, contact the Division to confirm if this file determination is still valid. This determination is applicable provided that the permit application is not subject to the PSD rules. If the permitting action is subject to PSD rules, please contact the Division for a PSD pre-construction monitoring determination.

The completeness checklist for modeling submittals is available here:
https://drive.google.com/file/d/1pEpivMUqVvLqxy3Au_Zf4ZHslPmtXZwl/view

State law requires that the Division determine the completeness of an application or any supplemental information requested for the application by the Division within 60 days of receipt. If the application (this includes the modeling submittal) is deemed incomplete, the applicant will be notified regarding the deficiencies and asked to either supplement the application or submit a new complete application. **It is important to note that our review will not begin until a complete application has been received.**

Please let us know if you have any questions.

Modeling Files Request
[Dispersion Modeling Unit](#)
[Stationary Sources Program](#)



O 720.235.8143

4300 Cherry Creek Drive South, Denver, CO 80246-1530

<https://cdphe.colorado.gov/air-emissions/air-quality-modeling-guidance-for-permits>

Learn more about COVID19 <https://www.colorado.gov/pacific/cdphe/apcd-covid-19> .

Are you curious about ground-level ozone in Colorado? Visit our [ozone webpage](#) to learn more.

Any correspondence with this Email address is subject to the Colorado Open Records Act and may be disclosed to third parties.

On Tue, Apr 8, 2025 at 12:03 PM APCD Modeling Files - CDPHE , CDPHE

<cdphe_apcd_modeling_files@state.co.us> wrote:

Ashley,

The modeling file data is currently under 2nd level review and should be ready by the end of the week.

We received your request last week on 4/1/2025. Our typical turnaround for modeling file determinations is 2-3 weeks.

Modeling Files Request
[Dispersion Modeling Unit](#)
[Stationary Sources Program](#)



O 720.235.8143

4300 Cherry Creek Drive South, Denver, CO 80246-1530

<https://cdphe.colorado.gov/air-emissions/air-quality-modeling-guidance-for-permits>

Learn more about COVID19 <https://www.colorado.gov/pacific/cdphe/apcd-covid-19> .

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Any correspondence with this Email address is subject to the Colorado Open Records Act and may be disclosed to third parties.

On Tue, Apr 8, 2025 at 11:36 AM Ashley Kung <ashley.kung@erm.com> wrote:

Good afternoon,

I am following up on the modeling data request for QTS DEN1 (see below). Can you provide an estimate for when the data will be ready?

Thank you,

-Ashley



ERM

Sustainability is our business

Ashley Kung
Managing Technical Consultant, Air Quality

Indianapolis
317-706-2004
317-695-6196

erm.com

From: Ashley Kung

Sent: Tuesday, April 1, 2025 10:31 AM

To: CDPHE APCD Modeling Files - CDPHE <cdphe_apcd_modeling_files@state.co.us>

Cc: Bennett Wildey <Bennett.Wildey@erm.com>; Daniel Guido <Daniel.Guido@erm.com>; Meghan Tracy-Burford <meghan.tracy-burford@erm.com>; Tiffany Cuni <Tiffany.Cuni@erm.com>

Subject: QTS DEN1 - Background Concentrations and Met Data Request

Good morning,

We are submitting a request for AERMOD-ready meteorological data and background concentrations for use in a modeling analysis for the QTS DEN1 facility. The proposed project to be modeled is the addition of 98 emergency generators at the site (ENG041-ENG138, with two potential engine options).

Per PMU guidance, we are choosing to forgo submitting form APCD-114 and will directly submit a modeling analysis with the

permit application for this project.

Met Data Request

- **UTM Coordinates:** 524756 m E, 4398209 m N (Zone 13, NAD83)
- **Source location on 1:24,000-scale topographic map:** see attached.
- **Brief description of sources:** Proposing to install and operate 98 additional 2.5MW emergency generators on-site, all equipped with SCR, with two potential engine options (YANCEY CAT 3516C or HOLT CAT 3516C). The two proposed options are the same engine from different providers, so the two options will have the same emissions, but different stack heights (~23 ft for HOLT and ~23.5 ft for YANCEY).

Background Concentrations Request

- Please see attached form. We also request seasonal $PM_{2.5}$ values for 24-hour $PM_{2.5}$ to account for the natural variation in $PM_{2.5}$ concentrations that occur throughout the year.

Please let me know if you have any questions.

Thank you,



ERM

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Ashley Kung

Managing Technical Consultant, Air Quality

Indianapolis
317-706-2004
317-695-6196

erm.com



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Ms. Ashley Kung

By email: ashley.kung@erm.com

April 9, 2025

Request Information

Facility: QTS DEN1

Company: QTS Aurora, LLC

County: Arapahoe

Latitude (NAD83): 39.73341

Longitude (NAD83): -104.71110

Requested Pollutants

Pollutant: CO, 1-hr (2nd Maximum)

Air Quality Standard: 35 ppm

Background: 1.8 ppm

Basis: La Casa 2021-2023

Pollutant: CO, 8-hr (2nd Maximum)

Air Quality Standard: 9 ppm

Background: 1.4 ppm

Basis: La Casa 2021-2023

Pollutant: O3, 8-hr (4th Maximum)

Air Quality Standard: 0.070 ppm

Background: 0.078 ppm

Basis: Aurora East, 2021-2023

Pollutant: SO2, 1-hr (99th percentile of maximum daily 1-hr values)

Air Quality Standard: 75 ppb

Background: 5.4 ppb

Basis: La Casa 2021-2023

Pollutant: SO2, 3-hr (2nd Maximum)

Air Quality Standard: 700 µg/m³ [CAAQS]

Background: 4.7 ppb

Basis: La Casa 2021-2023

Pollutant: SO₂, Annual Mean
 Air Quality Standard: 10 ppb
 Background: 0.6 ppb
 Basis: La Casa 2021-2023

Pollutant: NO₂, 1-hr (98th percentile of maximum daily 1-hr values)
 Air Quality Standard: 100 ppb
 Background: 56 ppb
 Basis: La Casa, 2021-2023

Pollutant: NO₂, Annual Mean
 Air Quality Standard: 53 ppb
 Background: 16 ppb
 Basis: La Casa, 2021-2023

Pollutant: PM₁₀, 24-hr $([N+1]^{\text{th}})$ Maximum where N is the number of years modeled)
 Air Quality Standard: 150 µg/m³
 Background: 49 µg/m³
 Basis: La Casa, 2021-2023

Pollutant: PM_{2.5}, 24-hr (98th percentile)
 Air Quality Standard: 35 µg/m³
 Background: 15.6 µg/m³
 Basis: La Casa 2021-2023 (smoke adjusted)

Pollutant: PM_{2.5}, annual mean
 Air Quality Standard: 9.0 µg/m³
 Background: 6.07 µg/m³
 Basis: La Casa 2021-2023 (smoke adjusted)

Not Requested Pollutants

Lead (Pb)

Upon request, refinement of a single value background concentration listed above may be conducted by the modeling staff (email: cdphe_apcd_modeling_files@state.co.us), if applicable, appropriate, and justified.

These estimates are derived from ambient monitored concentrations that are available to the Division to represent background levels (added to the impacts of the project emissions and emissions from other nearby sources) in cumulative ambient air impacts for comparison to the NAAQS. They are not suitable for applications beyond that scope of use. The quantity of data is sometimes limited and may be of uncertain quality. The ambient background concentrations -

1. Do not necessarily substitute for on-site monitoring data; i.e., for permitting actions subject to PSD rules, pre-construction monitoring may be required.
2. Indicate the ambient levels in general geographic areas, not a specific location. This is particularly true for particulate concentration values.
3. Are subject to change without notice as new information is acquired.

Use of these background estimates should be accompanied by an appropriate citation that indicates their source and their limitations. Referencing this letter would be adequate, but an expanded explanation is suggested.

If you have questions, I can be reached at 720-235-8143, or email:
cdphe_apcd_modeling_files@state.co.us.

Sincerely,

Dispersion Modeling Unit

Air Pollution Control Division

1-hr NO ₂ Concentration – La Casa (ppb)				
	Winter	Spring	Summer	Fall
	January–February 2021; January–February 2022; January–February 2023; December 2020-2022 ^a	March-May 2021; March-May 2022; March-May 2023	June-August 2021; June-August 2022; June-August 2023	September – November 2021; September – November 2022; September – November 2023
Hour Beginning	3rd ^b High (Multiyear average of the 98th percentile by season and hour of day)			
0	46.5	38.9	18.6	37.1
1	46.3	36.7	18.3	36.4
2	46.4	37.1	19.1	36.4
3	44.2	38.2	18.1	36.3
4	44.1	41.0	20.8	36.5
5	45.9	42.8	28.6	36.8
6	48.8	42.1	29.7	38.6
7	49.4	38.0	30.5	39.5
8	51.2	34.5	27.6	36.9
9	51.4	28.2	26.9	35.1
10	47.7	22.9	21.3	30.9
11	44.1	19.7	14.1	28.4
12	36.3	17.9	11.0	25.6
13	40.3	18.7	9.6	23.6
14	46.0	15.6	11.4	23.4
15	43.8	17.2	12.2	27.1
16	51.0	18.7	12.9	37.8
17	53.6	25.2	12.6	45.3
18	52.5	38.7	17.4	45.1
19	51.5	40.9	27.7	43.7
20	50.9	39.4	27.2	42.3
21	50.8	40.8	27.0	41.7
22	50.8	41.1	27.0	41.7
23	48.6	39.0	23.4	39.8

** La Casa NO₂ Profile 2021-2023

SO BACKGRND SEASHR 46.5 46.3 46.4 44.2 44.1 45.9 48.8 49.4 51.2 51.4 47.7 44.1 36.3 40.3 46 43.8 51 53.6 52.5 51.5 50.9 50.8 50.8 48.6

SO BACKGRND SEASHR 38.9 36.7 37.1 38.2 41 42.8 42.1 38 34.5 28.2 22.9 19.7 17.9 18.7 15.6 17.2 18.7 25.2 38.7 40.9 39.4 40.8 41.1 39

SO BACKGRND SEASHR 18.6 18.3 19.1 18.1 20.8 28.6 29.7 30.5 27.6 26.9 21.3 14.1 11 9.6 11.4 12.2 12.9 12.6 17.4 27.7 27.2 27 27 23.4

SO BACKGRND SEASHR 37.1 36.4 36.4 36.3 36.5 36.8 38.6 39.5 36.9 35.1 30.9 28.4 25.6 23.6 23.4 27.1 37.8 45.3 45.1 43.7 42.3 41.7 41.7 39.8

^a As of profile development (June 2024) no data is reported for December 2023. Substituted with December 2020 (Profile technically runs Dec 2020-Nov 2023)

^b The use of 3rd High to represent the 98th percentile is based on EPA's guidance in the 2011 NO₂ memo and assumes each season-hour sample set is approximately of size 91. For those season-hours where the sample size for this monitor differed significantly from the assumed size of 90-92 records for a complete dataset, the 2nd High or 1st High was used for that season-hour to represent the 98th percentile rather than the 3rd High.

1-hr O ₃ Concentration – Aurora East (ppb)				
	Winter	Spring	Summer	Fall
	January–February 2021; January–February 2022; January–February 2023; December 2021-2023	March-May 2021; March-May 2022; March-May 2023	June-August 2021; June-August 2022; June-August 2023	September – November 2021; September – November 2022; September – November 2023
Hour Beginning	4th High Value by Season and hour of day			
0	45.7	48.3	55.0	48.3
1	46.3	48.7	55.0	48.3
2	46.7	48.7	54.3	49.0
3	46.7	48.3	53.0	47.7
4	46.3	47.3	52.3	47.0
5	46.3	47.3	49.7	46.3
6	45.0	47.0	51.0	45.0
7	44.7	49.0	55.0	45.7
8	45.0	54.3	59.7	52.3
9	47.3	57.7	65.3	57.7
10	49.0	60.0	69.7	61.7
11	51.0	61.7	73.3	63.7
12	52.7	63.7	75.7	64.7
13	53.3	64.0	76.0	65.0
14	53.3	65.0	76.0	65.7
15	53.0	65.0	74.7	67.0
16	51.0	64.7	73.7	66.3
17	48.3	63.7	70.0	62.0
18	47.0	57.0	64.0	56.0
19	45.7	56.3	60.3	56.0
20	45.0	53.7	59.0	52.0
21	46.0	52.0	57.3	49.3
22	46.0	51.0	56.3	49.3
23	46.3	50.7	56.3	49.3

** Aurora East O₃ Profile 2021-2023

CO O3VALUES SEASHR 45.7 46.3 46.7 46.3 46.3 45 44.7 45 47.3 49 51 52.7 53.3 53.3 53 51 48.3 47 45.7 45 46 46 46.3

CO O3VALUES SEASHR 48.3 48.7 48.7 48.3 47.3 47.3 47 49 54.3 57.7 60 61.7 63.7 64 65 65 64.7 63.7 57 56.3 53.7 52 51 50.7

CO O3VALUES SEASHR 55 55 54.3 53 52.3 49.7 51 55 59.7 65.3 69.7 73.3 75.7 76 76 74.7 73.7 70 64 60.3 59 57.3 56.3 56.3

CO O3VALUES SEASHR 48.3 48.3 49 47.7 47 46.3 45 45.7 52.3 57.7 61.7 63.7 64.7 65 65.7 67 66.3 62 56 56 52 49.3 49.3 49.3

Site and facility information										Emission unit information									
Site Name	Facility ID	State (Facility)	County (Facility)	RPS code	EPA Region	Facility Description	Permitting Agency	Permit Number	Source classification code	Equipment class	Equipment description	Fuel Type	Equipment manufacture & model	Equipment manufacture date	Emission Unit Number	Equipment capacity	Control Equipment 1	Control Equipment 2	
DUIBER Electric, Gas, Drinking Water and Sanitary Services	237	AK	Anchorage	02020	10	UPG Power Plant	ADEC	AQ02237M5506	Refrigerating IC Engine	Jenbacher J55 420 Engines	Diesel/Kerosene	Jenbacher J55 420 Engines			04/96_98		1,966 bhp	Not listed - provide details in comments	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3516	Diesel/Kerosene	Caterpillar 3516			8		1,100 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3512	Diesel/Kerosene	Caterpillar 3512			6		830 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3516	Diesel/Kerosene	Caterpillar 3516			8		1,100 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3512	Diesel/Kerosene	Caterpillar 3512			5		830 kW	Uncontrolled	Uncontrolled
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3516	Diesel/Kerosene	Caterpillar 3516			5		1,135 kW	Uncontrolled	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3512	Diesel/Kerosene	Caterpillar 3512			6		830 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3516	Diesel/Kerosene	Caterpillar 3516			8		1,100 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3512	Diesel/Kerosene	Caterpillar 3512			5		830 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3606	Diesel/Kerosene	Caterpillar 3606			7		1,500 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3606	Diesel/Kerosene	Caterpillar 3606			7		1,500 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3600	Diesel/Kerosene	Caterpillar 3600			7		1,500 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3606	Diesel/Kerosene	Caterpillar 3606			7		1,500 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3516	Diesel/Kerosene	Caterpillar 3516			8		1,100 kW	Uncontrolled	Uncontrolled
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3516	Diesel/Kerosene	Caterpillar 3516			5		1,135 kW	Uncontrolled	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3516	Diesel/Kerosene	Caterpillar 3516			8		440 kW	Uncontrolled	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3516	Diesel/Kerosene	Caterpillar 3516			8		440 kW	Uncontrolled	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3516B	Diesel/Kerosene	Caterpillar 3516B			3		1,285 kW	Uncontrolled	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3516	Diesel/Kerosene	Caterpillar 3516			6		1,135 kW	Uncontrolled	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3516B	Diesel/Kerosene	Caterpillar 3516B			12		1,055 kW-e	Uncontrolled	Uncontrolled
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3516	Diesel/Kerosene	Caterpillar 3516			5		1,135 kW	Uncontrolled	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3516B	Diesel/Kerosene	Caterpillar 3516B			3		1,285 kW	Uncontrolled	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Detroit Diesel 16V140T1	Diesel/Kerosene	Detroit Diesel 16V140T1			10		1,000 kW	Uncontrolled	Uncontrolled
Dillingham Power Plant	214	AK	Dillingham	03070	10	Power Plant	ADEC	AQ021147VP02	Refrigerating IC Engine	Caterpillar 3512B	Diesel/Kerosene	Caterpillar 3512B			13		1,055 kW-e	Uncontrolled	
Dutch Harbor Power Plant	215	AK	Alutians West	02016	10	Power Plant	ADEC	AQ020157VP02	Refrigerating IC Engine	Wartsila Model 12V32C diesel electric generator	Diesel/Kerosene	Wartsila Model 12V32C diesel electric generator			14		1,211 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Caterpillar 3412	Diesel/Kerosene	Caterpillar 3412			6		1,540 kW/Btu/hr	Uncontrolled	Uncontrolled
Dillingham Power Plant	214	AK	Dillingham	03070	10	Power Plant	ADEC	AQ021147VP02	Refrigerating IC Engine	Caterpillar 3512B	Diesel/Kerosene	Caterpillar 3512B			13		1,055 kW-e	Uncontrolled	Uncontrolled
Dillingham Power Plant	214	AK	Dillingham	03070	10	Power Plant	ADEC	AQ021147VP02	Refrigerating IC Engine	Caterpillar 3512B	Diesel/Kerosene	Caterpillar 3512B			13		1,055 kW-e	Uncontrolled	Uncontrolled
Dutch Harbor Power Plant	215	AK	Alutians West	02016	10	Power Plant	ADEC	AQ020157VP02	Refrigerating IC Engine	Caterpillar C1700	Diesel/Kerosene	Caterpillar C1700			15		4,400 kW-e	Centrifugal Compressor	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Detroit Diesel 16V140T1	Diesel/Kerosene	Detroit Diesel 16V140T1			10		1,000 kW	Uncontrolled	Uncontrolled
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ024037VP03	Refrigerating IC Engine	Detroit Diesel 16V140T1	Diesel/Kerosene	Detroit Diesel 16V140T1			10		1,000 kW	Uncontrolled	Uncontrolled
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3512C	Diesel/Kerosene	Caterpillar 3512C			9		1,000 kW	Uncontrolled	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar C175-16	Diesel/Kerosene	Caterpillar C175-16			7		1,900 kW	Uncontrolled	
Dillingham Power Plant	214	AK	Dillingham	03070	10	Power Plant	ADEC	AQ021147VP02	Refrigerating IC Engine	Caterpillar 3512B	Diesel/Kerosene	Caterpillar 3512B			13		1,055 kW-e	Uncontrolled	Uncontrolled
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar C175-16	Diesel/Kerosene	Caterpillar C175-16			7		1,900 kW	Uncontrolled	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3512C	Diesel/Kerosene	Caterpillar 3512C			9		1,000 kW	Uncontrolled	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ02237VP03	Refrigerating IC Engine	Caterpillar 3512C	Diesel/Kerosene	Caterpillar 3512C			9		1,000 kW	Uncontrolled	

Site Name	Site and facility information										Testing and sampling information													
	Facility ID	State (Facility)	County (Facility)	WFO code	DPA Region	Facility Description	Permitting Agency	Permit Number	Testing company	Testing method	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Analysis method/used	Acid type	NO2 time log corrected?	Test date	Load (% of capacity)	Operating temp (°F)	Operation mode	Flow rate	Flow Rate Units	Test duration	Test type	Output units	Agencies
City of Seattle Gas, Drinking Water and Sanitary Services	243	AK	Alaska East	020320	10	USF Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/24/2012	40	0	Routine	unknown	NA	Source	ppmv	18	NA
Peter Pan Seafood King Cove Facility	243	AK	Alaska East	020320	10	Seafood Processor	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/24/2012	47	0	Routine	unknown	NA	Source	ppmv	164.2	NA
Peter Pan Seafood King Cove Facility	243	AK	Alaska East	020323	10	Seafood Processor	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/24/2012	49	0	Routine	unknown	NA	Source	ppmv	171.3	NA
Peter Pan Seafood King Cove Facility	243	AK	Alaska East	020313	10	Seafood Processor	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/24/2012	65	0	Routine	unknown	NA	Source	ppmv	165	NA
Peter Pan Seafood King Cove Facility	243	AK	Alaska East	020313	10	Seafood Processor	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/24/2012	66	0	Routine	unknown	NA	Source	ppmv	165	NA
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	40	568	Routine	1628	1628	1628	1628	1628	1628
Peter Pan Seafood King Cove Facility	243	AK	Alaska East	020313	10	Seafood Processor	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/27/2012	64	0	Routine	unknown	NA	Source	ppmv	155	NA
Peter Pan Seafood King Cove Facility	243	AK	Alaska East	020313	10	Seafood Processor	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/28/2012	78	0	Routine	unknown	NA	Source	ppmv	154.7	NA
Peter Pan Seafood King Cove Facility	243	AK	Alaska East	020313	10	Seafood Processor	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/27/2012	100	0	Routine	unknown	NA	Source	ppmv	146.3	NA
Peter Pan Seafood King Cove Facility	243	AK	Alaska East	020313	10	Seafood Processor	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/27/2012	100	0	Routine	unknown	NA	Source	ppmv	147	NA
Peter Pan Seafood King Cove Facility	243	AK	Alaska East	020313	10	Seafood Processor	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/27/2012	86	0	Routine	unknown	NA	Source	ppmv	146.8	NA
Peter Pan Seafood King Cove Facility	243	AK	Alaska East	020313	10	Seafood Processor	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/27/2012	60	0	Routine	unknown	NA	Source	ppmv	143.1	NA
Peter Pan Seafood King Cove Facility	243	AK	Alaska East	020313	10	Seafood Processor	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	3/27/2012	66	0	Routine	unknown	NA	Source	ppmv	146.3	NA
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	60	673	Routine	2206	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1596	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	80	601	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630	1630	1630	1630	1630
Tsk Power Generation Station	225	AK	Southeast Fairbanks	022440	10	Power Plant	ADEC	A020217W303	Alaska Source Testing, LLC	Method 7E - NOX - Instrumental with NOx or NO System Calibration	Thermo Environmental	Inst	Portable lab testing - chemiluminescent	No	4/7/2012	100	613	Routine	1568	1630</				

Site and facility information														Additional information				
Site Name	Facility ID	State (Facility)	County (Facility)	RPS code	EPA Region	Facility Description	Permitting Agency	Permit Number	Avg NO _x	Avg NO ₂	WQ	Ratio	Reporting entity	Contact name	Contact number	Contact email	Completeness check	Comments
DUIBER Electric, Gas, Drinking Water and Sanitary Services	237	AK	Anchorage	02020	10	UPG Power Plant	ADEC	AQ0237M55C6	85			0.22195393	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	GE LEANOX systems, same engines averaged all the tests together
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1665			0.09816019	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1768			0.09848451	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1863			0.09881104	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1857			0.09828035	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	1534			0.08136278	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1879			0.09869697	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1882			0.082195787	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1842			0.079531118	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1881			0.07988029	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1848			0.078514675	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1799			0.079452465	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1674			0.07734842	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	1833			0.075142091	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	1980			0.074662394	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	2241			0.074515305	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	1914			0.083647731	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	1338			0.08755128	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	1316			0.087395309	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	1183			0.085525781	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Dillingham Power Plant	214	AK	Dillingham	03070	10	Power Plant	ADEC	AQ0214VW03	1098			0.083352273	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	1995			0.08286065	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	901			0.080718221	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	438			0.058417552	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Dillingham Power Plant	214	AK	Dillingham	03070	10	Power Plant	ADEC	AQ0214VW03	1003			0.05912033	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Dutch Harbor Power Plant	215	AK	Alutians West	03036	10	Power Plant	ADEC	AQ0215VW03	1123			0.0602	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	657			0.052968097	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Dillingham Power Plant	214	AK	Dillingham	03070	10	Power Plant	ADEC	AQ0214VW03	571			0.049211909	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Dillingham Power Plant	214	AK	Dillingham	03070	10	Power Plant	ADEC	AQ0214VW03	834			0.04520387	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Dutch Harbor Power Plant	215	AK	Alutians West	03036	10	Power Plant	ADEC	AQ0215VW03	1066			0.046021143	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	628			0.045151004	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	671			0.042192887	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Peter Pan Seafoods King Cove Facility	243	AK	Alutians East	02033	10	Seafood Processor	ADEC	AQ0243VW03	721			0.038111244	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	915			0.038149478	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	515			0.035393806	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Dillingham Power Plant	214	AK	Dillingham	03070	10	Power Plant	ADEC	AQ0214VW03	668			0.033783784	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	698			0.02889721	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	503			0.028627088	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	726			0.026722763	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	
Tok Power Generation Station	225	AK	Southeast Fairbanks	02240	10	Power Plant	ADEC	AQ0225VW03	558			0.022002578	ADEC	Isaac Jackson		isaac.jackson@alaska.gov	Record Complete	

MAX 0.221
 MIN 0.022
 Average 0.065
 StDev 0.032
 count 40



APPENDIX C CDPHE COMPLETENESS CHECKLIST

MODELING SUBMITTAL COMPLETENESS CHECKLIST



Completeness Checklist – Modeling Submittal

A completeness check will be performed by the Permit Modeling Unit (PMU) within 60 days of receipt of a modeling submittal for an air quality impact analysis associated with an application subject to Colorado Air Quality Control Commission Regulation 3 to determine whether additional information is required to review the air quality impact analysis. A complete modeling submittal needs to represent the final design of the proposed project and address every element below. Please ensure that the following is included in your modeling submittal to prevent delays to the review:

1. Modeling Report

(a) General Input

- i. Description of the proposed project, description of the process including process flowchart, description of different operating scenarios if applicable, summary of emissions, and whether the facility is located in/nearby a nonattainment area

The description of the proposed project and description of the process as a process flow chart can be found in Section 1.1 of the modeling report, page 1, dated June 2025.

The summary of emissions can be found in Table 2-3 of the modeling report, page 6, dated June 2025.

The facility's location in a nonattainment area is described in Section 1.1 of the modeling report, page 2, dated June 2025.

- ii. Emission rates for all criteria pollutants and averaging periods of the corresponding National Ambient Air Quality Standards and Colorado Air Quality Standard, and the pollutant(s) and averaging period(s) addressed in the modeling

Emission rates for all criteria pollutants and averaging periods of the corresponding National Ambient Air Quality Standards and Colorado Air Quality can be found in Table 2-3 of the modeling report, page 6, dated June 2025.

- iii. Types of impact analysis submitted per pollutant/averaging period (i.e., significant impact analysis and/or cumulative/full air quality impact analysis)

The types of impact analysis submitted are addressed in Section 3 of the modeling report, pages 25-26, dated June 2025.

- iv. Description of how public access is precluded from the facility (if applicable)

A description of how public access is precluded from the facility is included in Section 2.4 of the modeling report, page 10, dated June 2025.

- v. Horizontal datum and zone of the coordinate system used to setup the model

The horizontal datum and zone of the coordinate system used can be found in Section 2.2 of the modeling report, page 4, dated June 2025.

- vi. Site/engineering plan drawn to scale and including the following: north arrow, property lines and contours for site grading of the final facility design, fences, emission source points/areas (source IDs that match APEN/inventory IDs), buildings, structures (e.g., equipment housing), a geo-reference point (e.g., coordinate, datum) in both print and electronic formats

There is no engineering plan included with the modeling analysis submittal. However, aerial maps containing other required items can be found in Figure 1-2, Figure 1-3, and Appendix A of the modeling report, dated June 2025.

- vii. Figures - Overlay of modeled layout of the sources, buildings/structures, and receptor network onto recently-dated aerial imagery and/or USGS 1:24,000-scale topographic map. Please submit, at a minimum, figures zoomed to the following:

- The source under review
- The full modeling domain

An overlay of the modeled layout of sources and buildings/structures on aerial imagery and a USGS 1:24,000-scale topographic map can be found in Appendix A of the modeling report, dated June 2025.

An overlay of the receptor network on aerial imagery can be found in Figure 2-1 and Figure 2-2 of the modeling report, pages 10-11, dated June 2025.

(b) Model Setup

- i. The version numbers of AERMAP, BPIPPRM, AERMOD, AERMET/AERMINUTE (if applicable) and all other models relied upon to prepare the modeling submittal

The version numbers of the models used in the modeling submittal can be found in:

- *AERMOD – Section 2.1, page 4*
- *AERMAP – Section 2.4, page 11*
- *BPIPPRM – Section 2.7, page 13*

- ii. Description of the meteorological data and a copy of the meteorological determination email from PMU

A description of the meteorological data can be found in Section 2.6 of the modeling report, page 13, dated June 2025.

A copy of the meteorological determination email can be found in Appendix B.

- iii. For Tier 3 NO₂ conversion, descriptions of the ozone data and in-stack NO₂/NO_x ratio(s) used and a copy of the ozone determination email and ratio approval from PMU

A description of the ozone data and in-stack NO₂/NO_x ratio used can be found in Section 2.9 of the modeling report, page 16, dated June 2025. The ISR analysis used to determine the NO₂/NO_x ratio can be found in Appendix B, dated June 2025.

- iv. Description of the spacing of the receptor network, including any receptor grid(s) or discrete receptor(s) added to clearly define the area of impact

A description of the spacing of the receptor network can be found in Section 2.4 of the modeling report, page 10, dated June 2025.

- v. Description of all areas where receptors have been omitted, if any, and if receptors have been excluded from within the property boundary, the basis for this approach

A description of the basis for excluding receptors from within the property boundary can be found in Section 2.4 of the modeling report, page 10, dated June 2025.

There are no other areas where receptors were omitted.

- vi. The data type(s) that have been assigned terrain elevations using survey data/contours (e.g., receptors and type, emission releases at the source under review, emission releases at other sources, buildings/structures, etc).

The data types that were assigned terrain elevations using survey data/contours can be found in Sections 2.3 and 2.7 of the modeling report, pages 4 and 13, dated June 2025.

- vii. The data type(s) that have been assigned terrain elevations with AERMAP (e.g., receptors and type, emission releases at the source under review, emission releases at other sources, buildings/structures, etc).

The data types that were assigned terrain elevations with AERMAP can be found in Section 2.4 of the modeling report, page 11, dated June 2025.

- viii. Description of the area coverage/boundary and resolution of the National Elevation Dataset file(s) used

A description of the area coverage/boundary and resolution of the NED files used can be found in Section 2.4 of the modeling report, page 11, dated June 2025.

- ix. Structures/buildings that have been included and excluded in the downwash analysis

A description of the downwash analysis can be found in Section 2.7 of the modeling report, page 13, dated June 2025.

- x. Summary of the building/structure dimensions (height, width, length, and base elevation) and basis for the structure/building dimensions (e.g., actual, derived, etc)

A summary of the building/structure dimensions and the basis for the dimensions can be found in Section 2.7, page 13 and Table 2-5, page 14 of the modeling report, dated June 2025.

- xi. Structures/buildings that are beside each other with a distance in separation that is less than their smallest dimension (height or width)

A summary of the building/structure dimensions and the basis for the dimensions can be found in Section 2.7, page 13 and Table 2-5, page 14 of the modeling report, dated June 2025.

- xii. Adjacent structures/buildings that have been characterized to represent a single structure

A summary of the building/structure dimensions and the basis for the dimensions can be found in Section 2.7, page 13 and Table 2-5, page 14 of the modeling report, dated June 2025.

- xiii. The point sources for which downwash parameters have been specified

A description of the downwash analysis can be found in Section 2.7 of the modeling report, page 13, dated June 2025. All point sources included in the modeling were specified with downwash parameters.

- xiv. A copy of the nearby source inventory obtained from the Division, description of the nearby sources that have been explicitly modeled and, if applicable, the procedure for filling missing data

Discussion on the inclusion of nearby sources can be found in Section 2.8 of the modeling report, page 16, dated June 2025.

- xv. Tables for each pollutant and averaging period (formats below) summarizing the emission rates and source characterization of each emission unit at the source under review and at nearby sources

A table that summarizes the source release parameters for each source can be found in Table 2-2 of the modeling report, page 5, dated June 2025.

A table that summarizes the emission rates for each pollutant and averaging time can be found in Table 2-3 of the modeling report, page 6, dated June 2025.

A table that summarizes the coordinates for each source can be found in Table 2-4 of the modeling report, page 6, dated June 2025.

- xvi. Basis of inputs for the following AERMOD **S**ource pathway keywords provided in the applicant's permit application/report for each emission unit:

If included: LOCATION/FLAT, URBANSRC, EMISFACT, EMISUNIT, CONCUNIT, DEPUNIT, PARTDIAM, MASSFRAX,

PARTDENS, METHOD_2, GASDEPOS, NO2RATIO, HOUREMIS,
BACKGRND, BACKUNIT, OLMGROUP, PSDGROUP, SRCGROUP

BACKGRND: the basis of background concentrations used is addressed in Section 2.8 of the modeling report, page 16. Detailed seasonal hourly background profiles information used in the modeling can be found in Appendix B of the modeling report, dated June 2025.

EMISFACT: the basis of using the EMISFACT keyword, along with the HROFDY option, is addressed in Section 2.3 of the modeling report, page 4, dated June 2025.

- xvii. If an emissions activity is represented by multiple sources (e.g., road), its characterization and basis/derivation

This does not apply to the modeling submittal.

- xviii. List the “SOURCE-RECEPTOR COMBINATIONS FOR WHICH CALCULATIONS MAY NOT BE PERFORMED” that have reported in the AERMOD output file(s) and describe each of the affected emission sources (e.g., haul road) and its characterization (e.g., volume)

This does not apply to the modeling submittal.

- xix. Basis of inputs for the following AERMOD COntrol pathway keywords:

MODELOPT, and if included, URBANOPT, HALFLIFE, DCAYCOEF, FLAGPOLE, GASDEPDF, GASDEPVD, GDLANUSE, GDSEASON, NO2EQUIL, NO2STACK, OZONEFIL, OZONEVAL, O3VALUES, OZONUNIT

MODELOPT: The basis for the use of the regulatory non-default option PVMRM with the MODELOPT keyword is discussed in Section 2.9, page 16, of the modeling report, dated June 2025.

NO2STACK and O3VALUES: The basis for the use of these keywords is discussed in Section 2.9, page 16, of the modeling report, dated June 2025.

(c) General Output

- i. Background concentrations and a copy of the email from the Division that provides this information

Background concentrations and a copy of the email providing this information is included in Appendix B of the modeling report, dated June 2025.

- ii. Model-estimated concentrations from the proposed project presented in isopleth map(s) and compared to the significant impact level(s) in tabular format

This does not apply to the modeling submittal as only a NAAQS analysis was completed.

- iii. Model-estimated concentrations (includes background and impacts from nearby sources) presented in isopleth map(s) and compared to the NAAQS in tabular format

Isopleth maps and tables presenting the model-estimated concentrations compared to the NAAQS can be found in Section 3 of the modeling report, page 25, dated June 2025.

2. Modeling Files

- (a) All input and output files for the models AERMAP, BPIPPRM, AERMOD, AERMET/AERMINUTE (if applicable) and all other models relied upon to prepare the modeling submittal

All input and output files for the models used in the modeling submittal can be found in Appendix D of the modeling report, dated June 2025.



APPENDIX D ELECTRONIC MODELING ARCHIVE



ERM HAS OVER 160 OFFICES ACROSS THE FOLLOWING
COUNTRIES AND TERRITORIES WORLDWIDE

Argentina	The Netherlands
Australia	New Zealand
Belgium	Peru
Brazil	Poland
Canada	Portugal
China	Puerto Rico
Colombia	Romania
France	Senegal
Germany	Singapore
Ghana	South Africa
Guyana	South Korea
Hong Kong	Spain
India	Switzerland
Indonesia	Taiwan
Ireland	Tanzania
Italy	Thailand
Japan	UAE
Kazakhstan	UK
Kenya	US
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