

DRAFT ENGINEERING EVALUATION

Facility ID No. 23401
Audentes Therapeutics, Inc.
528B Eccles Avenue, South San Francisco, CA 94080
Application No. 677348

Background

Audentes Therapeutics, Inc. is applying for an Authority to Construct/Permit to Operate for the following equipment:

- S-4 Emergency Standby Diesel Engine**
Make: Caterpillar, Engine Family: NCPXL32.0NZS, Model: C32,
Model Year: 2022
1483 bhp, 10.066 MMBtu/hr
Permit Condition# 27780, 100072, and 100073
- A-4 Selective Catalytic Reduction (SCR), Make: Safety Power, Model: ecoTube**

The criteria pollutants are nitrogen oxides (NO_x), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO₂) and particulate matter (PM₁₀). All of these pollutants are briefly discussed on the District's web site at www.baaqmd.gov.

S-4 is abated by A-4 selective catalytic reduction (SCR) system.

S-4 meets the Environmental Protection Agency and California Air Resources Board (EPA/CARB) Tier 2 Off-road standard. With the addition of SCR, the proposed engine is expected to meet Tier 4 requirements as required for emergency standby diesel engines greater than 1000 bhp that trigger BACT. The engine will burn commercially available California low sulfur diesel fuel. The sulfur content of the diesel fuel will not exceed 0.0015% by weight.

This project is over 1,000 feet from the nearest K-12 school. However, this project is located within the Overburdened Community (OBC) as defined in Regulation 2-1-243. Therefore, public notification is required for this project.

This evaluation report will discuss compliance of the proposed project with all applicable rules and regulations.

Emissions

S-4 is abated by A-4 selective catalytic reduction (SCR) system.

Table 1. Abated Annual and Daily Emissions from EPA/CARB Certified Data for S-4

Pollutant	Abated Emission Factor (g/bhp-hr)	Max Daily Emissions (lbs./day)	Annual Emissions (lbs./yr)	Annual Emissions (tons/yr)
NOX	0.499	39.136	81.534	0.041
POC	0.060	4.704	9.800	0.005
PM ₁₀ /PM _{2.5} ¹	0.045	3.528	7.350	0.004
CO	0.670	52.536	109.450	0.055
SO ₂	N/A ²	0.360	0.750	3.75E-04

Basis:

- Annual emissions: Reliability-related activity 50 hours for S-4
- Max daily emissions: 24-hour operation
- Emissions from EPA Engine Family NCPXL32.0NZS for S-4. Manufacturer-guaranteed NOx emission factor is used.
- ¹ Conservative Assumption: All PM emissions are PM_{2.5}
- ² SO₂ emission factor from AP-42 Table 3.4-1, SO₂ (15 ppm) = 0.00809*0.0015 lb. SO₂/bhp-hr

Plant Cumulative Increase

Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result from this application.

Table 2. Plant Cumulative Emissions Increase, Post 4/5/91

Pollutant	Existing Emissions Post 4/5/91 (tons/yr)	Application Emissions (tons/yr)	Cumulative Emissions (tons/yr)
NOx	0.000	0.041	0.041
POC	0.000	0.005	0.005
PM ₁₀ /PM _{2.5}	0.000	0.004	0.004
CO	0.000	0.055	0.055
SO ₂	0.000	3.75E-04	3.75E-04

This facility has S-1 Loss of Exemption (LOE) Emergency Diesel Generator, S-2 Small Boiler, and S-3 Small Boiler. S-2 and S-3 boilers are registered equipment. Therefore, the emissions from S-1, S-2, and S-3 will not be considered for the cumulative increase for this facility.

Table 3 below summarizes Potential to Emit (PTE) breakdown for the facility.

Table 3. Potential to Emit for FID 23401

Source	Description	NOx	POC	PM ₁₀ /PM _{2.5}	CO	SO ₂	Relevant Application
1	LOE Engine	0.444 tpy	0.036 tpy	0.030 tpy	0.096 tpy	0.030 tpy	Application 27700. Since this is an LOE engine, 20 hours/year of discretionary operation is assumed. For PTE calculations, the sum of 20 hours of discretionary operation and 100 hours of emergency operation, and therefore, 120 hours/year of total annual operation is assumed.
4	Emergency Backup Generator	1.020	0.015	0.011	0.164	0.001	Current Application

Since S-1 is considered to be a loss-of-exemption source, the discretionary emissions from this source will not be added to the cumulative increase for this facility.

Per “Policy: Calculating potential to Emit for Emergency Backup Power Generators”, the sum of 100 hours of annual emergency operation, and the annual discretionary hours of operation will be used for determining the potential to emit (PTE) for each emergency engine.

Therefore, the following total annual operation hours are used for the PTE calculations of the S-1 LOE engine and S-4 new engine:

S-1 LOE Engine:

= 20 hours of annual discretionary operation + 100 hours of emergency annual operation
= 120 hours of total annual operation hours

S-4 New Engine:

= 50 hours of annual discretionary operation + 100 hours of emergency annual operation
= 150 hours of total annual operation hours

S-2 Small Boiler, and S-3 Small Boiler are registered equipment. Therefore, the PTE calculations for these devices are not included.

Health Risk Assessment (HRA)

HRA was required. The diesel particulate emissions from the project are greater than the toxic trigger level of 0.26 lb./year. All PM₁₀ emissions are considered diesel particulate emissions. The PM₁₀ emissions from this application are summarized in Table 1. There were no other related projects permitted in the last five years. Since the diesel particulate emissions from the project are greater than the toxic trigger level of 0.26 lb./year, an HRA is required. This application did not qualify for HRA streamlining because receptors are located less than 100 feet from the proposed engine location.

The project is in compliance with project risk requirements as recommended, limiting reliability-related activity hours by permit condition. See HRA report.

HRA Results

This analysis estimates the incremental health risk resulting from toxic air contaminant (TAC) emissions from non-emergency operation of a standby generator diesel engine at this facility. Results from this HRA indicate that the maximum project cancer risk is estimated at 0.26 in a million, and the maximum project chronic hazard index is estimated at 0.00021. See HRA Report for more details.

Table 4. Risk screening results

Maximally Exposed Receptor	Maximum Cancer Risk	Maximum Chronic Hazard Index
Residential	0.025 chances in a million	0.0000068
Off-site worker	0.26 chances in a million	0.00021

TBACT

In accordance with the District’s Regulation 2-5-301, this source does not require TBACT because the estimated source cancer risk is less than 1.0 in a million.

Project Risk Limits

Since the proposed engine, operating at 50 hours/year for reliability related testing, complies with TBACT, and the estimated project cancer risk does not exceed 10 in a million and the chronic hazard index does not exceed 1.0, this project complies with the District’s Regulation 2-5-302 project risk requirements. No additional operating hour restrictions were necessary for this project.

Best Available Control Technology (BACT)

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NOx, CO, SO₂, or PM₁₀.

BACT for this source is presented in the current BAAQMD BACT/TBACT Workbook for IC Engine – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document #96.1.5, dated 12/22/2020. For NO_x, CO, POC and PM₁₀, BACT(2) is specifically highlighted. For SO₂, BACT(2) is using fuel with sulfur content not to exceed 0.0015%, or 15 ppm. The more restrictive BACT(1) standards are not applicable to this engine because it will be limited to operation as an emergency standby engine.

S-4 satisfies the current BACT(2) standards for the following pollutants which exceed 10 lbs./day in Table 1:

Pollutant	Emission Factor	BACT(2) Standard
NO _x	0.499 g/bhp-hr	0.5 g/bhp-hr
CO	0.670 g/bhp-hr	2.6 g/bhp-hr

Offsets

Offset must be provided for any new or modified source at a facility that will have the potential to emit more than 10 tons per year of NO_x or POC, as specified in Regulation 2-2-302; 100 tons per year or more of PM_{2.5}, PM₁₀ or sulfur dioxide, as specified in Regulation 2-2- 303.

This facility has S-1 Loss of Exemption (LOE) Emergency Diesel Generator, S-2 Small Boiler, and S-3 Small Boiler. S-2 and S-3 boilers are registered equipment.

Since S-1 is considered to be a loss-of-exemption source, the discretionary emissions from this source will not be added to the cumulative increase for this facility.

The emissions from S-1, S-2, and S-3 do not affect the PTE analysis.

Table 5. Offset Trigger Calculation for FID 23401

Pollutant	Existing Annual Emissions (TPY)	Application Annual Emissions* (TPY)	Facility Annual Emissions (TPY) *	Offset Requirement (TPY)	Offset Required
NO _x	0.000	0.123	0.041	>10	N
POC	0.000	0.015	0.005	>10	N
PM ₁₀ /PM _{2.5} ¹	0.000	0.012	0.004	≥100	N
CO	0.000	0.165	0.055	-	N
SO ₂	0.000	0.001	3.75E-04	≥100	N

*Annual emissions: 150 hours of operation for S-4. 150 hours include both the emergency and discretionary hours of operation.

Since the facility's potential to emit is below the offsets trigger levels specified in Regulation 2-2, offsets are not required.

Statement of Compliance

The owner/operator is expected to comply with all applicable requirements. Key requirements are listed below:

Airborne Toxic Control Measure for Stationary Compression Ignition Engines
 ATCM, 5/19/2011, section 93115, title 17, CA Code of Regulations

District Rules

- Regulation 6-1-303 (*Ringelmann No. 2 Limitation*)
- Regulation 9-1-301 (*Limitations on Ground Level Concentrations of SO₂*)
- Regulation 9-8 (*NO_x and CO from Stationary Internal Combustion Engines*)
 - Section 9-8-110.5 – Limited exemption for emergency standby engines
 - Section 9-8-330 – Hours of operation for emergency standby engines
 - Section 9-8-502 – Recordkeeping

California Environmental Quality Act (CEQA)

This project is ministerial under the District Regulation 2-1-311 (Permit Handbook Chapter 2.3) and is therefore not subject to CEQA review.

New Source Performance Standards (NSPS)

40 CFR 60, Subpart IIII (*Stationary Compression Ignition Internal Combustion Engines*)

National Emissions Standards for Hazardous Air Pollutants (NESHAP)
40 CFR 63, Subpart ZZZZ (*Stationary Reciprocating Internal Combustion Engines (RICE)*)

Prevention of Significant Deterioration (PSD)

This application is not part of a PSD project as defined in Regulation 2-2.

Public Notification (Regulation 2-1-412)

This project is over 1,000 feet from the nearest K-12 school. However, this project is located within the Overburdened Community (OBC) as defined in Regulation 2-1-243. Therefore, public notification is required for this project.

Permit Conditions

Permit Condition #27780 for S-4

1. Tier 2 Engines, equipped with add-on SCR but no DPF; ST for NOX/CO
 1. The owner/operator shall ensure the engine is abated at all times of operation by an approved Selective Catalytic Reduction (SCR) System. The engine and SCR System shall be installed, maintained, and operated in accordance with the manufacturer specifications and/or best modern practices.
[Basis: Cumulative Increase, Title 17 CCR Section 93115.6(a)(3), 40 CFR 1039.101, BACT]
 2. The owner/operator shall ensure urea injection commences as soon as the SCR catalyst bed reaches the minimum operating temperature as specified by the manufacturer. [Basis: Cumulative Increase, Title 17 CCR Section 93115.6(a)(3), 40 CFR 1039.101, BACT]
 3. The owner/operator shall ensure engine emissions do not exceed an ammonia (NH₃) slip of 10 ppmv, dry @ 15% O₂ from the SCR system. If deemed necessary to demonstrate compliance with Regulation 2, Rule 5, the Air District may require a source test to determine compliance

with this emission limit.
[Basis: Regulation 2, Rule 5]

4. The owner/operator shall ensure engine emissions do not exceed the following limit:

NOx: 0.50 g/bhp-hour

CO: 2.60 g/bhp-hour

[Basis: BACT and Cumulative Increase]

5. To demonstrate compliance with Part 4, the owner/operator shall conduct an initial Air District-approved source test on the engine within 60 days of startup and once every three years thereafter at the normal or expected load during emergency operation using Air District approved source test methods. The owner/operator shall document urea usage (gallons per minute) and average kW during all tests, preferable as digital records. The owner/operator shall submit the source test results to the Air District's Source Test Section no later than 60 days after source test completion.

[Basis: BACT and Cumulative Increase]

6. The owner/operator shall comply with all applicable testing, sampling port location and safe access requirements as specified in Volume IV of the Air District's Manual of Procedures. The owner/operator shall notify the Air District's Source Test Section, in writing, of the source test protocols, sampling port locations, layout, access and projected test dates at least 30 days prior to testing. The following test methods shall be used for each pollutant:

NOx EPA Method 7E or Air District-approved equivalent

CO EPA Method 10 or Air District-approved equivalent

[Basis: Regulation 2-1-403]

7. To determine compliance with the above, the owner/operator shall maintain the following records in a Air District-approved log and shall make these records available to Air

District staff upon request. All records shall be retained for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or Synthetic Minor Operating Permit). These recordkeeping requirements shall not replace the recordkeeping requirements contained in any applicable Air District or state regulations.

- a. Source Test Notifications
 - b. All source test reports
 - c. Engine serial number and source number for each source test
 - d. Engine load percentage
 - e. Engine and SCR maintenance records
 - f. SCR system owner's manual or manufacturer's specifications
 - g. SCR urea injection rate (gpm)
- [Basis: BACT, Cumulative Increase, Recordkeeping]

Permit Condition# 100072 for S-4

1. The owner or operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, state or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, state or Federal emission limits is not limited.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
2. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
3. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or

at the engine's location, and made immediately available to the District staff upon request.

- a. Hours of operation for reliability-related activities (maintenance and testing).
- b. Hours of operation for emission testing to show compliance with emission limits.
- c. Hours of operation (emergency).
- d. For each emergency, the nature of the emergency condition. Fuel usage for each engine(s).
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

4. At School and Near-School Operation: If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply: The owner or operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:
 - a. Whenever there is a school sponsored activity (if the engine is located on school grounds)
 - b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session.'School' or 'School Grounds' means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). 'School' or 'School Grounds' includes any building or structure, playground, athletic field, or other areas of school property but does not include unimproved school property.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

Permit Condition #100073 for S-4

The owner/operator shall not exceed the following limits per year per engine for reliability-related activities:

- 50 Hours of Diesel fuel (Diesel fuel)
[Basis: Cumulative Increase; Regulation 2-5; Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

End of Conditions

Recommendation

The Air District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to

comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source triggers public notification requirements per Regulation 2-1-412. After the comments are received from the public and reviewed, the Air District will make a final determination on the permit.

I recommend that the District initiates a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct and/or a Permit to Operate for the following equipment:

- S-4 Emergency Standby Diesel Engine**
Make: Caterpillar, Engine Family: NCPXL32.0NZS, Model: C32,
Model Year: 2022
1483 bhp, 10.066 MMBtu/hr
Permit Condition# 27780, 100072, and 100073
- A-4 Selective Catalytic Reduction (SCR), Make: Safety Power, Model: ecoTube**



Youjin Kim, Air Quality Engineer
01/29/2024

Attachment 1

BAY AREA AIR QUALITY MANAGEMENT DISTRICT Best Available Control Technology (BACT) Guideline

Source Category

Source:	IC Engine-Compression Ignition: Stationary Emergency, non- Agricultural, non-direct drive fire pump	Revision:	0
		Document #:	96.1.5
Class:	≥ 1000 BHP Output	Date:	12/22/2020*

Determination

Pollutant	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
POC (NMHC)	1. n/s ^a 2. 0.14 g/bhp-hr ^b	1. n/s ^a 2. Any engine certified or verified to achieve the applicable standard
NOx	1. n/s ^a 2. 0.5 g/bhp-hr ^b	1. n/s ^a 2. Any engine certified or verified to achieve the applicable standard
SO₂	1. n/s ^a 2. Fuel sulfur content not to exceed 0.0015% (wt) or 15 ppm (wt)	1. n/s ^a 2. CARB Diesel Fuel (Ultra Low Sulfur Diesel)
CO	1. n/s ^a 2. 2.6 g/bhp-hr ^b	1. n/s ^a 2. Any engine certified or verified to achieve the applicable standard
PM₁₀	1. n/s ^a 2. 0.02 g/bhp-hr ^b 3. 0.02 g/bhp-hr	1. n/s ^a 2. Any engine or technology demonstrated, certified or verified to achieve the applicable standard 3. Any engine or technology demonstrated, certified or verified to achieve the applicable standard
NPOC	1. n/s 2. n/s	1. n/s 2. n/s

* Applies to open permit applications with a complete date on or after 1/1/2020.

References

- a. Cost effectiveness analysis must be based on lesser of 50 hr/yr or non-emergency operation as limited by District health risk screen analysis.
- b.
 1. BAAQMD Application 27020 San Jose/Santa Clara Water Pollution Control
 2. BAAQMD Application 25115 Sutro Tower, Inc.
 3. Microsoft MWH Data Center, Quincy, Washington
Tier 4-Compliant (Tier 2 engines abated by catalyzed diesel particulate filter and selective catalytic reduction)
<https://ecology.wa.gov/Air-Climate/Air-quality/Data-Centers>
 4. Comments by the California Air Resources Board on the California Energy Commission's Proposed Decision for the Proposed Sequoia Data Center project (19-SPPE-03), Attachment 2: Tier 4 Diesel Emergency Generator Engines

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