San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

October 6, 2021

Michael Aldrich
Mercy Medical Center Merced
333 Mercy Ave
Merced, CA 95340

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: N-7718
Project Number: N-1211784

Dear Mr. Aldrich:

Enclosed for your review and comment is the District's analysis of Mercy Medical Center Merced's application for an Authority to Construct for a 755 horsepower Tier 2 certified diesel engine to provide emergency power in the event of an electrical outage, at 315 Mercy Ave in Merced.

The notice of preliminary decision for this project has been posted on the District's website (www.valleyair.org). Please submit your written comments on this project within the 30-day public comment period, as specified in the enclosed public notice.

Also enclosed is a copy of the California Health and Safety Code (§42301.6) and the public notification letter sent out to the parents or guardians of students at Cruickshank Middle School and residences within 1,000 feet of the proposed project.

After addressing all comments made during the 30-day public notice period, the District intends to issue the Authority to Construct.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Mr. Dakota Ballard of Permit Services at (559) 230-5865 or dakota.ballard@valleyair.org.

Sincerely,

Brian Clements
Director of Permit Services

BC:dhb

Enclosures

cc: Courtney Graham, CARB (w/ enclosure) via email

Samir Sheikh
Executive Director/Air Pollution Control Officer

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San Joaquin Valley Air Pollution Control District
Authority to Construct
Application Review
Diesel-Fired Emergency Standby IC Engine

Facility Name:	Mercy Medical Center Merced	Date:	October 4, 2021
Mailing Address:	333 Mercy Ave Merced, CA 95340	Engineer:	Dakota Ballard
		Lead Engineer:	Jesse Garcia
Contact Person:	Michael Aldrich		
Telephone:	209-564-4910		
E-mail:	Michael.Aldrich@commonspirit.org		
Application #:	N-7718-5-0		
Project #:	N-1211784		
Deemed Complete:	May 27, 2021		

I. Proposal

Mercy Medical Center Merced is proposing to install a 755 bhp (intermittent) diesel-fired emergency standby internal combustion (IC) engine powering an electrical generator. This engine was installed in 2010 without an Authority to Construct. The engine was installed with controls that meet Best Available Control Technology (BACT) at the time of installation.

II. Applicable Rules

Rule 2201 New and Modified Stationary Source Review Rule (8/15/19)
Rule 2410 Prevention of Significant Deterioration (6/16/11)
Rule 2520 Federally Mandated Operating Permits (8/15/19)
Rule 4001 New Source Performance Standards (4/14/99)
Rule 4002 National Emission Standards for Hazardous Air Pollutants (5/20/04)
Rule 4101 Visible Emissions (2/17/05)
Rule 4102 Nuisance (12/17/92)
Rule 4201 Particulate Matter Concentration (12/17/92)
Rule 4701 Internal Combustion Engines - Phase 1 (8/21/03)
Rule 4702 Internal Combustion Engines (8/19/21)
Rule 4801 Sulfur Compounds (12/17/92)
CH&SC 41700 Health Risk Assessment
CH&SC 42301.6 School Notice
Title 17 CCR, Section 93115 - Airborne Toxic Control Measure (ATCM) for Stationary Compression-Ignition (CI) Engines
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Project Location

The equipment will be located at 315 Mercy Ave in Merced, CA.

The District has verified that the equipment is located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is applicable to this project.

IV. Process Description

The emergency standby engine powers an electrical generator. Other than emergency standby operation, the engine may be operated up to 50 hours per year for maintenance and testing purposes.

V. Equipment Listing

N-7718-5-0: 755 BHP (INTERMITTENT) CUMMINS MODEL QSX15-G9 TIER 2 CERTIFIED DIESEL-FIRED EMERGENCY STANDBY IC ENGINE POWERING AN ELECTRICAL GENERATOR

VI. Emission Control Technology Evaluation

The applicant has proposed to install a Tier 2 certified diesel-fired IC engine that is fired on very low-sulfur diesel fuel.

The proposed engine meets the latest Tier Certification requirements for emergency standby engines; therefore, the engine meets the latest ARB/EPA emissions standards for diesel particulate matter, hydrocarbons, nitrogen oxides, and carbon monoxide (see Appendix C for a copy of the emissions data sheet).

The use of CARB certified diesel fuel (0.0015% by weight sulfur maximum) reduces SO_X emissions by over 99% from standard diesel fuel.

VII. General Calculations

A. Assumptions

Emergency operating schedule:	24 hours/day
Non-emergency operating schedule:	50 hours/year
Density of diesel fuel:	7.1 lb/gal
EPA F-factor (adjusted to 60 °F):	9,051 dscf/MMBtu
Fuel heating value:	137,000 Btu/gal
BHP to Btu/hr conversion:	2,542.5 Btu/bhp-hr
Thermal efficiency of engine:	commonly ≈ 35%
PM_{10} fraction of diesel exhaust:	0.96 (CARB, 1988)

Conversion factor: 1.34 bhp/kw
To streamline emission calculations, $PM_{2.5}$ emissions are assumed to be equal to PM_{10} emissions.

The engine has certified NO_X + VOC emissions of 4.3 g/bhp-hr. It will be assumed the NOx + VOC emission factor is split 95% NOx and 5% VOC (per the Carl Moyer program).

B. Emission Factors

Emission Factors		
Pollutant	**Emission Factor (g/bhp-hr)**	**Source**
NO_X	4.1	Engine Manufacturer
SO_X	0.0051	Mass Balance Equation Below
PM_{10}	0.10	Engine Manufacturer
CO	0.4	Engine Manufacturer
VOC	0.2	Engine Manufacturer

$$\frac{0.000015\ lb-S}{lb-fuel}\times\frac{7.1\ lb-fuel}{gallon}\times\frac{2\ lb-SO_2}{1\ lb-S}\times\frac{1\ gal}{137{,}000\ Btu}\times\frac{1\ bhp\ input}{0.35\ bhp\ out}\times\frac{2{,}542.5\ Btu}{bhp-hr}\times\frac{453.6\ g}{lb}=\ 0.0051\ \frac{g-SO_x}{bhp-hr}$$

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Since this is a new emissions unit, PE1 = 0.

2. Post-Project Potential to Emit (PE2)

The daily and annual PE2 are calculated as follows:

Daily PE2 (lb-pollutant/day) = EF (g-pollutant/bhp-hr) x rating (bhp) x operation (hr/day) / 453.6 g/lb

Annual PE2 (lb-pollutant/yr) = EF (g-pollutant/bhp-hr) x rating (bhp) x operation (hr/yr) / 453.6 g/lb

Post-Project Emissions (PE2)						
Pollutant	**Emissions Factor (g/bhp-hr)**	**Rating (bhp)**	**Daily Hours of Operation (hrs/day)**	**Annual Hours of Operation (hrs/year)**	**Daily PE2 (lb/day)**	**Annual PE2 (lb/yr)**
NO_x	4.1	755	24	50	**163.8**	**341**
SO_x	0.0051	755	24	50	**0.2**	**0**
PM_{10}	0.10	755	24	50	**4.0**	**8**
CO	0.4	755	24	50	**16.0**	**33**
VOC	0.2	755	24	50	**8.0**	**17**

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to District Rule 2201, the SSPE1 is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATCs) or Permits to Operate (PTOs) at the Stationary Source and the quantity of Emission Reduction Credits (ERCs) which have been banked since September 19, 1991 for Actual Emissions Reductions (AER) that have occurred at the source, and which have not been used on-site.

SSPE1 is summarized in the following table. See Appendix F for detailed SSPE calculations.

SSPE1 (lb/year)					
	NO_X	**SO_X**	**PM_{10}**	**CO**	**VOC**
SSPE1	4,932	634	1,730	16,632	1,090

4. Post-Project Stationary Source Potential to Emit (SSPE2)

Pursuant to District Rule 2201, the Post-Project Stationary Source Potential to Emit (SSPE2) is the PE from all units with valid ATCs or PTOs, except for emissions units proposed to be shut down as part of the Stationary Project, at the Stationary Source and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site.

For this project the change in emissions for the facility is due to the installation of the new emergency standby IC engine. Thus:

SSPE2 (lb/year)					
Permit Unit	**NO_X**	**SO_X**	**PM_{10}**	**CO**	**VOC**
SSPE1	4,932	634	1,730	16,632	1,090
N-7718-5-0	341	0	8	33	17
SSPE2	**5,273**	**634**	**1,738**	**16,665**	**1,107**

5. Major Source Determination

Rule 2201 Major Source Determination:

Pursuant to District Rule 2201, a Major Source is a stationary source with a SSPE2 equal to or exceeding one or more of the following threshold values. For the purposes of determining major source status the following shall not be included:

- any ERCs associated with the stationary source
- Emissions from non-road IC engines (i.e. IC engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the specific source categories specified in 40 CFR 51.165

Rule 2201 Major Source Determination (lb/year)						
	NO_X	**SO_X**	**PM_{10}**	**$PM_{2.5}$**	**CO**	**VOC**
SSPE1	4,932	634	1,730	1,730	16,632	1,090
SSPE2	5,273	634	1,738	1,738	16,665	1,107
Major Source Threshold	20,000	140,000	140,000	140,000	200,000	20,000
Major Source?	No	No	No	No	No	No

As seen in the table above, the facility is not an existing Major Source and is not becoming a Major Source as a result of this project.

Rule 2410 Major Source Determination:

The facility is not an existing Major Source for PSD for at least one pollutant. Therefore the facility is not an existing Major Source for PSD.

6. Baseline Emissions (BE)

BE = Pre Project Potential to Emit for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to District Rule 2201

Since this is a new emissions unit, BE = PE1 = 0 for all pollutants.

7. SB 288 Major Modification

SB 288 Major Modification is defined in 40 CFR Part 51.165 as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."

Since this facility is not a major source for any of the pollutants addressed in this project, this project does not constitute an SB 288 major modification.

8. Federal Major Modification / New Major Source

Federal Major Modification

District Rule 2201 states that a Federal Major Modification is the same as a “Major Modification” as defined in 40 CFR 51.165 and part D of Title I of the CAA.

As defined in 40 CFR 51.165, Section (a)(1)(v) and part D of Title I of the CAA, a Federal Major Modification is any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act. The significant net emission increase threshold for each criteria pollutant is included in Rule 2201.

Since this facility is not a Major Source for any pollutants, this project does not constitute a Federal Major Modification and no further discussion is required.

New Major Source

As demonstrated above, this facility is not becoming a Major Source as a result of this project, therefore, this facility is not a New Major Source pursuant to 40 CFR 51.165 a(1)(iv)(A)(3).

9. Rule 2410 - Prevention of Significant Deterioration (PSD) Applicability Determination

The project potential to emit, by itself, will not exceed any PSD major source thresholds. Therefore Rule 2410 is not applicable and no further discussion is required.

10. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. Detailed QNEC calculations are included in Appendix E.

VIII. Compliance

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis for the following[1]:

a. Any new emissions unit with a potential to emit exceeding two pounds per day,
b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or
d. Any new or modified emissions unit, in a stationary source project, which results in an SB288 Major Modification or a Federal Major Modification, as defined by the rule.

[1] Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

As discussed in Section I, the facility is proposing to install a new emergency standby IC engine. Additionally, as determined in Sections VII.C.7 and VII.C.8, this project does not result in an SB288 Major Modification or a Federal Major Modification, respectively. Therefore, BACT can only be triggered if the daily emissions exceed 2.0 lb/day for any pollutant.

The daily emissions from the new engine are compared to the BACT threshold levels in the following table:

New Emissions Unit BACT Applicability				
Pollutant	**Daily Emissions for the new unit (lb/day)**	**BACT Threshold (lb/day)**	**SSPE2 (lb/yr)**	**BACT Triggered?**
NO_X	163.8	> 2.0	n/a	Yes
SO_X	0.2	> 2.0	n/a	No
PM_{10}	4.0	> 2.0	n/a	Yes
CO	16.0	> 2.0 and SSPE2 ≥ 200,000 lb/yr	16,665	No
VOC	8.0	> 2.0	n/a	Yes

As shown on the previous page, BACT will be triggered for NO_X, PM_{10}, and VOC emissions from the engine for this project.

2. BACT Guideline

BACT Guideline 3.1.1, which appears in Appendix B of this report, covers diesel-fired emergency IC engines in 2010, the year the engine in this project was installed.

3. Top Down BACT Analysis

Per District Policy APR 1305, Section IX, "A top down BACT analysis shall be performed as a part of the Application Review for each application subject to the BACT requirements pursuant to the District's NSR Rule for source categories or classes covered in the BACT Clearinghouse, relevant information under each of the following steps may be simply cited from the Clearinghouse without further analysis."

Pursuant to the attached top down BACT Analysis, which appears in Appendix B of this report, BACT is satisfied with:

NO_X: Latest EPA Tier Certification level for applicable horsepower range
VOC: Latest EPA Tier Certification level for applicable horsepower range
PM_{10}: 0.15 g/bhp-hr

The facility has proposed to install a 755 bhp Tier 2 certified IC engine (with a PM_{10} emissions rate of 0.10 g/bhp-hr). Therefore, BACT is satisfied for NO_x, VOC, and PM_{10}.

B. Offsets

1. Offset Applicability

Pursuant to Section 4.6.2 of this rule, offsets are not required for emergency IC engines. The engine in this project is an emergency IC engine; therefore, this exemption is applicable to this project.

However, even when there is an applicable exemption, the SSPE2 values are compared to the offset threshold to determine if offsets are triggered. In its PAS database, the District keeps track of facilities where offsets are triggered but an exemption applies. The SSPE2 values are compared to the offset trigger thresholds in the following table:

Offset Determination (lb/year)					
	NOx	**SOx**	**PM_{10}**	**CO**	**VOC**
SSPE2	5,273	634	1,738	16,665	1,107
Offset Thresholds	20,000	54,750	29,200	200,000	20,000
Offsets Triggered?	No	No	No	No	No

2. Quantity of Offsets Required

As shown in the table above, no offset thresholds are exceeded with this project. Further, as previously stated, the offset exemption from Section 4.6.2 of District Rule 2201 is applicable to this project; therefore, offset calculations are not necessary and offsets are not required.

C. Public Notification

1. Applicability

Public noticing is required for:

a. <u>New Major Sources, SB288 Major Modifications, and Federal Major Modifications</u>

As shown in Sections VII.C.5, VII.C.7, and VII.C.8, this facility is not a new Major Source, not an SB 288 Major Modification, and not a Federal Major Modification, respectively.

b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any pollutant

As calculated in Section VII.C.2, daily emissions for NO_X are greater than 100 lb/day.

c. Any project which results in the offset thresholds being surpassed

The SSPE1 and SSPE2 are compared to the offset thresholds in the following table.

Offset Thresholds				
Pollutant	**SSPE1 (lb/year)**	**SSPE2 (lb/year)**	**Offset Threshold**	**Public Notice Required?**
NO_X	4,932	5,273	20,000 lb/year	No
SO_X	634	634	54,750 lb/year	No
PM_{10}	1,730	1,738	29,200 lb/year	No
CO	16,632	16,665	200,000 lb/year	No
VOC	1,090	1,107	20,000 lb/year	No

As detailed above, there were no thresholds surpassed with this project; therefore public noticing is not required for offset purposes.

d. Any project with a Stationary Source Project Increase in Permitted Emissions (SSIPE) greater than 20,000 lb/year for any pollutant

For this project, the proposed engine is the only emissions unit that will generate an increase in Potential to Emit. Since the proposed engine emissions are well below 20,000 lb/year for all pollutants (See Section VII.C.2), the SSIPE for this project will be below the public notice threshold.

e. Any project which results in a Title V significant permit modification

Since this facility does not have a Title V operating permit, this change is not a Title V significant Modification, and therefore public noticing is not required.

2. Public Notice Action

As demonstrated above, this project will require public noticing. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be electronically published on the District's website prior to the issuance of the ATC for this equipment.

D. Daily Emissions Limits

Daily Emissions Limitations (DELs) and other enforceable conditions are required by Rule 2201 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. The DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. Therefore, the following conditions will be listed on the ATC as a mechanism to ensure compliance:

- {4771} Emissions from this IC engine shall not exceed any of the following limits: 4.1 g-NOx/bhp-hr, 0.4 g-CO/bhp-hr, or 0.2 g-VOC/bhp-hr. [District Rule 2201 and 17 CCR 93115]

- {4772} Emissions from this IC engine shall not exceed 0.10 g-PM10/bhp-hr based on USEPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102, and 17 CCR 93115]

- {4258} Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight is to be used. [District Rules 2201 and 4801, and 17 CCR 93115]

E. Compliance Assurance

1. Source Testing

Pursuant to District Policy APR 1705, source testing is not required for emergency standby IC engines to demonstrate compliance with District Rule 2201.

2. Monitoring

No monitoring is required to demonstrate compliance with District Rule 2201.

3. Recordkeeping

Recordkeeping requirements, in accordance with District Rule 4702, will be discussed in Section VIII, District Rule 4702, of this evaluation.

4. Reporting

No reporting is required to ensure compliance with District Rule 2201.

F. Ambient Air Quality Analysis (AAQA)

An AAQA shall be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. The District's Technical Services Division conducted the required analysis. Refer to Appendix D of this document for the AAQA summary sheet.

The proposed location is in an attainment area for NO_X, CO, and SO_X. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for NO_X, CO, or SO_X.

The proposed location is in a non-attainment area for the state's PM_{10} as well as federal and state $PM_{2.5}$ thresholds. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for PM_{10} and $PM_{2.5}$.

Rule 2410 Prevention of Significant Deterioration

As shown in Section VII.C.9 above, this project does not result in a new PSD major source or PSD major modification. No further discussion is required.

Rule 2520 Federally Mandated Operating Permits

Since this facility's potential to emit does not exceed any Major Source thresholds of Rule 2201, this facility is not a Major Source, and Rule 2520 does not apply.

Rule 4001 New Source Performance Standards (NSPS)

40 CFR 60 Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The District has not been delegated the authority to implement Subpart IIII requirements for non-Major Sources; therefore, no requirements shall be included on the permit.

Rule 4002 National Emission Standards for Hazardous Air Pollutants

40 CFR 63 Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Emissions (RICE)

The District has not been delegated the authority to implement NESHAP regulations for Area Source requirements for non-Major Sources; therefore, no requirements shall be included on the permit.

Rule 4101 Visible Emissions

Rule 4101 states that no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. Therefore, the following condition will be listed on the ATC as a mechanism to ensure compliance:

- {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

Rule 4102 Nuisance

Rule 4102 states that no air contaminant shall be released into the atmosphere which causes a public nuisance. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, the following condition will be listed on the ATC as a mechanism to ensure compliance:

- {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – *Risk Management Policy for Permitting New and Modified Sources* specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

An HRA is not required for a project with a total facility prioritization score of less than one. According to the Technical Services Memo for this project (Appendix D), the total facility prioritization score including this project was greater than one. Therefore, an HRA was required to determine the short-term acute and long-term chronic exposure from this project.

RMR Summary			
Categories	**Emergency IC Engine (Unit 5-0)**	**Project Totals**	**Facility Totals**
Prioritization Score	N/A[1]	N/A[1]	>1
Acute Hazard Index	N/A[2]	N/A[2]	0.00
Chronic Hazard Index	0.00	0.00	0.00
Maximum Individual Cancer Risk	1.11E-06	1.11E-06	1.95E-06
T-BACT Required?	Yes		
Special Permit Conditions?	Yes		

1. Prioritization for this unit was not conducted since the district determined that all diesel-fired IC engines will result in a prioritization score greater than one.
2. Acute Hazard Index was not calculated for Unit 1 since there is no risk factor or the risk factor is so low that it has been determined to be insignificant for this type of unit.

Discussion of T-BACT

BACT for toxic emission control (T-BACT) is required if the cancer risk exceeds one in one million. As demonstrated above, T-BACT is required for this project because the HRA indicates that the risk is above the District's thresholds for triggering T-BACT requirements.

For this project T-BACT is triggered for PM_{10}. T-BACT is satisfied with BACT (see Appendix B), which is:

PM_{10}: 0.15 g/bhp-hr

Therefore, compliance with the District's Risk Management Policy is expected.

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification not have acute or chronic indices, or a cancer risk greater than the District's significance levels (i.e. acute and/or chronic indices greater than 1 and a cancer risk greater than 20 in a million). As outlined by the Technical Services Memo in Appendix D of this report, the emissions increases for this project were determined to be less than significant.

The following conditions will be listed on the ATC as a mechanism to ensure compliance with the RMR:

- {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]

- {4772} Emissions from this IC engine shall not exceed 0.10 g-PM10/bhp-hr based on USEPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102, and 17 CCR 93115]

- {4920} This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 50 hours per calendar year. [District Rules 2201, 4102, and 4702, and 17 CCR 93115]

Rule 4201 Particulate Matter Concentration

Rule 4201 limits particulate matter emissions from any single source operation to 0.1 g/dscf, which, as calculated below, is equivalent to a PM_{10} emission factor of 0.4 g-PM_{10}/bhp-hr.

$$0.1 \quad \frac{grain-PM}{dscf} \times \frac{g}{15.43 grain} \times \frac{1\,Btu_{in}}{0.35\,Btu_{out}} \times \frac{9{,}051 dscf}{10^6\,Btu} \times \frac{2{,}542.5\,Btu}{1 bhp-hr} \times \frac{0.96 g-PM_{10}}{1g-PM} = 0.4 \frac{g-PM_{10}}{bhp-hr}$$

The new engine has a PM_{10} emission factor less than 0.4 g/bhp-hr. Therefore, compliance is expected and the following condition will be listed on the ATC as a mechanism to ensure compliance:

- {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Rule 4701 Internal Combustion Engines - Phase 1

The purpose of this rule is to limit the emissions of nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds (VOC) from internal combustion engines. Except as provided in Section 4.0, the provisions of this rule apply to any internal combustion engine, rated greater than 50 bhp, which requires a PTO.

The proposed engine is also subject to District Rule 4702, Internal Combustion Engines. Since emissions limits of District Rule 4702 and all other requirements are equivalent or more stringent than District Rule 4701 requirements for emergency engines, compliance with District Rule 4702 requirements will satisfy requirements of District Rule 4701.

Rule 4702 Internal Combustion Engines

Emergency standby engines are subject to District Rule 4702 requirements. Emergency standby engines are defined in Section 3.0 of District Rule 4702 as follows:

> *3.15 Emergency Standby Engine: an internal combustion engine which operates as a temporary replacement for primary mechanical or electrical power during an unscheduled outage caused by sudden and reasonably unforeseen natural disasters or sudden and reasonably unforeseen events beyond the control of the operator. An engine shall be considered to be an emergency standby engine if it is used only for the following purposes: (1) periodic maintenance, periodic*

readiness testing, or readiness testing during and after repair work; (2) unscheduled outages, or to supply power while maintenance is performed or repairs are made to the primary power supply; and (3) if it is limited to operate 100 hours or less per calendar year for non-emergency purposes. An engine shall not be considered to be an emergency standby engine if it is used: (1) to reduce the demand for electrical power when normal electrical power line service has not failed, or (2) to produce power for the utility electrical distribution system, or (3) in conjunction with a voluntary utility demand reduction program or interruptible power contract.

Emergency standby engines cannot be used to reduce the demand for electrical power when normal electrical power line service has not failed, or to produce power for the electrical distribution system, or in conjunction with a voluntary utility demand reduction program or interruptible power contract. The following conditions will be included on the permit:

- {3807} An emergency situation is an unscheduled electrical power outage caused by sudden and reasonably unforeseen natural disasters or sudden and reasonably unforeseen events beyond the control of the permittee. [District Rule 4702 and 17 CCR 93115]

- {3808} This engine shall not be used to produce power for the electrical distribution system, as part of a voluntary utility demand reduction program, or for an interruptible power contract. [District Rule 4702 and 17 CCR 93115]

The 100 hour requirement is less stringent than the Air Toxic Control Measure operating limitations for emergency standby engines. Therefore, compliance with the applicable Air Toxic Control Measure requirements ensures compliance with the 100 hour requirement.

Operation of emergency standby engines are limited to 100 hours or less per calendar year for non-emergency purposes. The Air Toxic Control Measure for Stationary Compression Ignition Engines (Stationary ATCM) limits this engine's maintenance and testing to 50 hours/year; therefore, compliance is expected. The following conditions will be included on the permit:

- {4920} This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 50 hours per calendar year. [District Rules 2201, 4102, and 4702, and 17 CCR 93115]

The following exemption in Section 4.2 of District Rule 4702 applies to emergency standby engines:

4.2 Except for the requirements of Section 5.10 and Section 6.2.3, the requirements of this rule shall not apply to:

4.2.1 An emergency standby engine as defined in Section 3.0 of this rule, and provided that it is operated with a nonresettable elapsed operating time meter. In lieu of a nonresettable time meter, the owner of an emergency engine may use an alternative device, method, or technique, in determining operating time provided that the alternative is approved by the APCO. The owner of the engine shall properly maintain and operate the time meter or alternative device in accordance with the manufacturer's instructions.

Pursuant to the exemption in Section 4.2, the following requirements of Section 5.9 are applicable to emergency standby engines

Section 5.10 requires the owner to:

5.10.2 Properly operate and maintain each engine as recommended by the engine manufacturer or emission control system supplier.

5.10.3 Monitor the operational characteristics of each engine as recommended by the engine manufacturer or emission control system supplier.

5.10.4 Install and operate a nonresettable elapsed operating time meter. In lieu of installing a nonresettable time meter, the owner of an engine may use an alternative device, method, or technique, in determining operating time provided that the alternative is approved by the APCO and is allowed by Permit-to-Operate or Permit-Exempt Equipment Registration condition. The owner of the engine shall properly maintain and operate the time meter or alternative device in accordance with the manufacturer's instructions.

Properly operate and maintain each engine as recommended by the engine manufacturer or emission control system supplier. The following condition will be included on the permit:

- {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]

Monitor the operational characteristics of each engine as recommended by the engine manufacturer or emission control system supplier. The following condition will be included on the permit:

- {3478} During periods of operation for maintenance, testing, and required regulatory purposes, the permittee shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system

supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or other operational characteristics as recommended by the manufacturer or supplier). [District Rule 4702]

Install and operate a nonresettable elapsed time meter. In lieu of installing a nonresettable elapsed time meter, the operator may use an alternative device, method, or technique, in determining operating time provided that the alternative is approved by the APCO and EPA and is allowed by Permit-to-Operate condition. The operator shall properly maintain and operate the nonresettable elapsed time meter or alternative device in accordance with the manufacturer's instructions. The following condition will be included on the permit:

- {4749} This engine shall be equipped with a non-resettable hour meter with a minimum display capability of 9,999 hours, unless the District determines that a non-resettable hour meter with a different minimum display capability is appropriate in consideration of the historical use of the engine and the owner or operator's compliance history. [District Rule 4702 and 17 CCR 93115]

The exemption in Rule 4702 Section 4.2 for emergency standby engines requires the engines to comply with Section 6.2.3, shown below.

> *6.2.3 An owner claiming an exemption under Section 4.2 or Section 4.3 shall maintain annual operating records. This information shall be retained for at least five years, shall be readily available, and provided to the APCO upon request. The records shall include, but are not limited to, the following:*
>
> > *6.2.3.1 Total hours of operation,*
> > *6.2.3.2 The type of fuel used,*
> > *6.2.3.3 The purpose for operating the engine,*
> > *6.2.3.4 For emergency standby engines, all hours of non-emergency and emergency operation shall be reported, and*
> > *6.2.3.5 Other support documentation necessary to demonstrate claim to the exemption.*

Records of the total hours of operation, type of fuel used, purpose for operating the engine, all hours of non-emergency and emergency operation, and other support documentation must be maintained. All records shall be retained for a period of at least five years, shall be readily available, and be made available to the APCO upon request. The following conditions will be included on the permit:

- {3496} The permittee shall maintain monthly records of emergency and non-emergency operation. Records shall include the number of hours of emergency operation, the date and number of hours of all testing and maintenance operations, the purpose of the operation (for example: load testing, weekly testing, rolling

blackout, general area power outage, etc.) and records of operational characteristics monitoring. For units with automated testing systems, the operator may, as an alternative to keeping records of actual operation for testing purposes, maintain a readily accessible written record of the automated testing schedule. [District Rule 4702 and 17 CCR 93115]

- {4263} The permittee shall maintain monthly records of the type of fuel purchased. [District Rule 4702 and 17 CCR 93115]

- {3475} All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 4702 and 17 CCR 93115]

Rule 4801 Sulfur Compounds

Rule 4801 requires that sulfur compound emissions (as SO_2) shall not exceed 0.2% by volume. Using the ideal gas equation, the sulfur compound emissions are calculated as follows:

Volume SO_2 = (n x R x T) ÷ P
n = moles SO_2
T (standard temperature) = 60 °F or 520 °R
R (universal gas constant) = $\frac{10.73\,\text{psi}\cdot\text{ft}^3}{\text{lb}\cdot\text{mol}\cdot{}^\circ\text{R}}$

$$\frac{0.000015\ lb-S}{lb-fuel}\times\frac{7.1\,\text{lb}}{\text{gal}}\times\frac{64\,\text{lb}-SO_2}{32\,\text{lb}-S}\times\frac{1\,\text{MMBtu}}{9{,}051\,\text{scf}}\times\frac{1\,\text{gal}}{0.137\,\text{MMBtu}}\times\frac{\text{lb}-\text{mol}}{64\,\text{lb}-SO_2}\times\frac{10.73\,\text{psi}-\text{ft}^3}{\text{lb}-\text{mol}-{}^\circ\text{R}}\times\frac{520{}^\circ\text{R}}{14.7\,\text{psi}}\times 1{,}000{,}000 = \quad 1.0\ \text{ppmv}$$

Since 1.0 ppmv is ≤ 2,000 ppmv, this engine is expected to comply with Rule 4801. Therefore, the following condition will be listed on the ATC as a mechanism to ensure compliance:

- {4258} Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight is to be used. [District Rules 2201 and 4801, and 17 CCR 93115]

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this engine is located within 1,000 feet of the following school:

School Name: Cruickshank Middle School
Address: 601 Mercy Ave, Merced, CA 95340

Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is required.

Prior to the issuance of the ATC for this equipment, notices will be provided to the parents/guardians of all students of the affected school, and will be sent to all residents within 1,000 feet of the site.

The District has verified that there are no additional schools within one-quarter mile of the emission source.

Title 17 California Code of Regulations (CCR), Section 93115 - Airborne Toxic Control Measure (ATCM) for Stationary Compression-Ignition (CI) Engines

The following requirements apply to new engines (those installed after 1/1/05):

Title 17 CCR Section 93115 Requirements for New Emergency IC Engines Powering Electrical Generators	**Proposed Method of Compliance with Title 17 CCR Section 93115 Requirements**
Emergency engines must be fired on CARB diesel fuel, or an approved alternative diesel fuel.	The applicant has proposed the use of CARB certified diesel fuel. The proposed permit condition, requiring the use of CARB certified diesel fuel, is included on the permit. • {4258} Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight is to be used. [District Rules 2201 and 4801, and 17 CCR 93115]
The engine must meet the emission standards in Table 1 of the ATCM for the specific power rating and model year of the proposed engine.	The applicant has proposed the use of an engine that is certified to the latest EPA Tier Certification standards for the applicable horsepower range, guaranteeing compliance with the emission standards of the ATCM. Additionally, the proposed diesel PM emissions rate is less than or equal to 0.15 g/bhp-hr.
The engine may not be operated more than 50 hours per year for maintenance and testing purposes unless the PM emissions are $\leq$ 0.01 g/bhp-hr, then the engine is allowed 100 hours per year. Emissions from this engine are certified at 0.10 g/bhp-hr, therefore the engine is allowed 50 hours.	The following conditions will be included on the permit: • {4772} Emissions from this IC engine shall not exceed 0.10 g-PM10/bhp-hr based on USEPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102, and 17 CCR 93115] • {4920} This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 50 hours per calendar year. [District Rules 2201, 4102, and 4702, and 17 CCR 93115]
Engines, with a PM_{10} emissions rate greater than 0.01 g/bhp-hr and located at schools, may not be operated for	The District has verified that this engine is not located within 500' of a school.

maintenance and testing whenever there is a school sponsored activity on the grounds. Additionally, engines located within 500 feet of school grounds may not be operated for maintenance and testing between 7:30 AM and 3:30 PM	
A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed upon engine installation, or by no later than January 1, 2005, on all engines subject to all or part of the requirements of sections 93115.6, 93115.7, or 93115.8(a) unless the District determines on a case-by-case basis that a non-resettable hour meter with a different minimum display capability is appropriate in consideration of the historical use of the engine and the owner or operator's compliance history.	The following condition will be included on the permit: • {4749} This engine shall be equipped with a non-resettable hour meter with a minimum display capability of 9,999 hours, unless the District determines that a non-resettable hour meter with a different minimum display capability is appropriate in consideration of the historical use of the engine and the owner or operator's compliance history. [District Rule 4702 and 17 CCR 93115]
An owner or operator shall maintain monthly records of the following: emergency use hours of operation; maintenance and testing hours of operation; hours of operation for emission testing; initial start-up testing hours; hours of operation for all other uses; and the type of fuel used. All records shall be retained for a minimum of 36 months.	The following condition will be included on the permit: • {3496} The permittee shall maintain monthly records of emergency and non-emergency operation. Records shall include the number of hours of emergency operation, the date and number of hours of all testing and maintenance operations, the purpose of the operation (for example: load testing, weekly testing, rolling blackout, general area power outage, etc.) and records of operational characteristics monitoring. For units with automated testing systems, the operator may, as an alternative to keeping records of actual operation for testing purposes, maintain a readily accessible written record of the automated testing schedule. [District Rule 4702 and 17 CCR 93115]

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The San Joaquin Valley Unified Air Pollution Control District (District) adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
- Identify the ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The District performed an Engineering Evaluation (this document) for the proposed project and determined that the project qualifies for ministerial approval under the District's Guideline for Expedited Application Review (GEAR). Section 21080 of the Public Resources Code exempts from the application of CEQA those projects over which a public agency exercises only ministerial approval. Therefore, the District finds that this project is exempt from the provisions of CEQA.

Indemnification Agreement/Letter of Credit Determination

According to District Policy APR 2010 (CEQA Implementation Policy), when the District is the Lead or Responsible Agency for CEQA purposes, an indemnification agreement and/or a letter of credit may be required. The decision to require an indemnity agreement and/or a letter of credit is based on a case-by-case analysis of a particular project's potential for litigation risk, which in turn may be based on a project's potential to generate public concern, its potential for significant impacts, and the project proponent's ability to pay for the costs of litigation without a letter of credit, among other factors.

As described above, the project requires only ministerial approval, and is exempt from the provisions of CEQA. As such, an Indemnification Agreement or a Letter of Credit will not be required for this project in the absence of expressed public concern.

IX. Recommendation

Pending a successful NSR public noticing and school noticing period, issue Authority to Construct N-7718-5-0 subject to the permit conditions on the attached draft ATC in Appendix A.

X. Billing Information

Billing Schedule			
Permit Number	**Fee Schedule**	**Fee Description**	**Fee Amount**
N-7718-5-0	3020-10-D	755 bhp IC engine	$577

Appendixes

A. Draft ATC
B. BACT Guideline and BACT Analysis
C. Emissions Data Sheet
D. RMR and AAQA
E. QNEC Calculations
F. SSPE1 Calculations

Appendix A
Draft ATC

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: N-7718-5-0 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: MERCY MEDICAL CENTER MERCED
MAILING ADDRESS: ATTN: ACCTS PAYABLE
3400 DATA DR 3RD FL
RANCHO CORDOVA, CA 95670

LOCATION: 315 MERCY AVE
MERCED, CA 95340

EQUIPMENT DESCRIPTION:
755 BHP (INTERMITTENT) CUMMINS MODEL QSX15-G9 TIER 2 CERTIFIED DIESEL-FIRED EMERGENCY STANDBY IC ENGINE POWERING AN ELECTRICAL GENERATOR

CONDITIONS

1. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
3. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
4. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. {4749} This engine shall be equipped with a non-resettable hour meter with a minimum display capability of 9,999 hours, unless the District determines that a non-resettable hour meter with a different minimum display capability is appropriate in consideration of the historical use of the engine and the owner or operator's compliance history. [District Rule 4702 and 17 CCR 93115]
6. {4258} Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight is to be used. [District Rules 2201 and 4801, and 17 CCR 93115]
7. Emissions from this IC engine shall not exceed any of the following limits: 4.1 g-NOx/bhp-hr, 0.4 g-CO/bhp-hr, or 0.2 g-VOC/bhp-hr. [District Rule 2201 and 17 CCR 93115]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

Brian Clements, Director of Permit Services
N-7718-5-0 : Oct 6 2021 1:27PM -- BALLARDD : Joint Inspection NOT Required

8. Emissions from this IC engine shall not exceed 0.10 g-PM10/bhp-hr based on USEPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102, and 17 CCR 93115]

9. {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]

10. {3478} During periods of operation for maintenance, testing, and required regulatory purposes, the permittee shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or other operational characteristics as recommended by the manufacturer or supplier). [District Rule 4702]

11. {3807} An emergency situation is an unscheduled electrical power outage caused by sudden and reasonably unforeseen natural disasters or sudden and reasonably unforeseen events beyond the control of the permittee. [District Rule 4702 and 17 CCR 93115]

12. {3808} This engine shall not be used to produce power for the electrical distribution system, as part of a voluntary utility demand reduction program, or for an interruptible power contract. [District Rule 4702 and 17 CCR 93115]

13. {3496} The permittee shall maintain monthly records of emergency and non-emergency operation. Records shall include the number of hours of emergency operation, the date and number of hours of all testing and maintenance operations, the purpose of the operation (for example: load testing, weekly testing, rolling blackout, general area power outage, etc.) and records of operational characteristics monitoring. For units with automated testing systems, the operator may, as an alternative to keeping records of actual operation for testing purposes, maintain a readily accessible written record of the automated testing schedule. [District Rule 4702 and 17 CCR 93115]

14. {4920} This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 50 hours per calendar year. [District Rules 2201, 4102, and 4702, and 17 CCR 93115]

15. {4263} The permittee shall maintain monthly records of the type of fuel purchased. [District Rule 4702 and 17 CCR 93115]

16. {3475} All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 4702 and 17 CCR 93115]

Appendix B
BACT Guideline and BACT Analysis

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 3.1.1
Last Update: 7/10/2009
Emergency Diesel IC Engine

Pollutant	Achieved in Practice or in the SIP	Technologically Feasible	Alternate Basic Equipment
CO	Latest EPA Tier Certification level for applicable horsepower range		
NOx	Latest EPA Tier Certification level for applicable horsepower range		
PM10	0.15 g/hp-hr or the Latest EPA Tier Certification level for applicable horsepower range, whichever is more stringent. (ATCM)		
SOx	Very low sulfur diesel fuel (15 ppmw sulfur or less)		
VOC	Latest EPA Tier Certification level for applicable horsepower range		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

Top Down BACT Analysis for the Emergency IC Engine

BACT at the Time of Installation

The engine proposed in this project was installed in April of 2010, without an ATC permit. Pursuant to District practice regarding equipment that was installed without an ATC permit, if the equipment was installed with BACT (i.e. Achieved in Practice BACT at the time of installation), or if BACT did not exist at the time of installation, the current BACT analysis is limited to the types of controls that can be applied to the specific equipment that was already installed (i.e. add-on controls).

Since this engine was installed in 2010, it was subject to BACT Guideline 3.1.1, Emergency Diesel IC Engine, (9/10/2009). A copy of this guideline is attached in Appendix B. As shown on the guideline, BACT for this engine at the time of installation was:

NO_X: Latest EPA Tier Certification level for applicable horsepower range

VOC: Latest EPA Tier Certification level for applicable horsepower range

PM_{10}: 0.15 g/hp-hr or the Latest EPA Tier Certification level for applicable horsepower range, whichever is more stringent. (ATCM)

This engine is a Tier 2 certified unit. At the time of installation in 2010, Tier 2 was the latest available certification standard for the proposed 755 bhp engine. The engine was therefore installed with BACT for NOx, VOC, and PM_{10}, and the current BACT analysis will be limited to the types of controls that can be applied to the engine that has already been installed (i.e. add-on controls).

1. BACT Analysis for NOx Emissions:

a. Step 1 - Identify all control technologies

The following NOx control options are identified for this IC engine:

- Latest EPA Tier Certification level for applicable horsepower range (Achieved in Practice – BACT 3.1.1 – last updated July 10, 2009)

- Latest EPA Tier certification level for applicable horsepower range (Achieved in Practice – current BACT 3.1.1 – last updated 6/13/2019)

As indicated above, both versions of BACT Guideline 3.1.1 required latest EPA Tier certification level for applicable horsepower range. The only difference is that in 2010 the required certification level for this IC engine was Tier 2, whereas currently the engine would be required to meet Tier 4F certification level.

The emission standard for a 755 bhp Tier 4F IC engine is 2.6 g-NO_x/bhp-hr.[2] Since the proposed engine has an emission rate of 4.1 g-NO_x/bhp-hr, it would need to be retrofitted with an add-control device in order to meet the latest Tier certification standard. The following add-on control device has been identified:

- Selective Catalytic Reduction (SCR)

SCR decreases NOx emissions by using a catalyst and the injection of a reductant such as ammonia or urea to convert NOx into water and nitrogen. This is accomplished when the catalyst lowers the temperature of the reaction that is needed to convert NOx into water and nitrogen. Once the engine exhaust heats up to at least 260 ^oC, the catalyst activates and the reductant is added into the exhaust stream. The aforementioned chemical reaction then takes place which reduces the NOx emissions by approximately 95%.

b. Step 2 - Eliminate technologically infeasible options

The control option listed in Step 1 is not technologically infeasible.

c. Step 3 - Rank remaining options by control effectiveness

No ranking needs to be done because there is only one control option identified under Step 1.

d. Step 4 - Cost Effectiveness Analysis

Selective Catalytic Reduction (SCR)

(A). Emission Reduction:

Based on the NOx potential emissions calculated in Section VII.C.2 of this evaluation and assuming a NOx control efficiency of 95%[3] from the installation of a SCR system, the amount of NOx emissions reduction is calculated below:

NOx Emission Reductions = Annual PE_{NOx} $\times$ 1 tons/2,000 lb $\times$ Overall Control Eff.
= 341 lb/year $\times$ 1 tons/2,000 lb $\times$ 0.95
= **0.16 ton/year**

[2] https://ww2.arb.ca.gov/resources/documents/non-road-diesel-engine-certification-tier-chart

[3] Based on ARB's document referenced on the following page, a well-designed SCR system can reduce NOx emissions up to 95%.

(B). Total Capital Cost Investment (TCI)

Based on ARB's 2010 article titled "Analysis of the Technical Feasibility and Costs of After-Treatment Controls on New Emergency Standby Engines"[4], the average capital cost of installing a SCR system on an engine is $80/hp.

Based on the Consumer Price Index Inflation Calculator (https://www.bls.gov/data/inflation_calculator.htm), the average capital cost from 2010 is adjusted to $100 in July 2021.

In addition, according to the ARB's article identified above, this average capital cost does not include the cost of installation, which according to the SCR manufacturers could increase capital cost by 25% to over 100%. To be conservative, the District will assume a minimum 25% SCR installation cost. Thus:

SCR Capital Cost = Cost/hp x bhp rating = $100/hp x 755 bhp = $75,500

Cost of Installation = SCR Capital Cost x 25% = $75,500 x 0.25 = $18,875

Total Capital Investment = SCR Capital Cost + Cost of Installation
= $75,500 + $18,875
= $94,375

Annualized Capital Costs

Annualized Capital Investment = Total Capital Investment x Amortization Factor

Amortization Factor = $\frac{0.04(1.04)^{10}}{(1.04)^{10}-1}$ = 0.123 per District policy, amortizing over 10 years at 4%

Therefore, Annualized Capital Investment = $94,375 x 0.123 **= $11,608**

(C). Cost Effectiveness of a SCR with 95% Capture

Cost Effectiveness = Annualized Capital Costs ($/year) ÷ Emission Reduction (ton-NOx/year) = $11,608/year÷ 0.16 ton-NOx/year
= $72,550/ton-NOx

As shown above, the capital cost of SCR system with 95% capture efficiency is $72,550 per ton, which is greater than the District's NOx cost-effectiveness threshold of $31,600/ton. Therefore, the NOx control option is not cost effective and is being removed from further consideration for this project.

[4] https://ww2.arb.ca.gov/sites/default/files/classic/regact/2010/atcm2010/atcmappb.pdf

e. Step 5 - Select BACT

BACT for NOx emissions from this emergency standby diesel IC engine was the Tier 2 certification level at the time of installation in 2010, as shown in the Tier Certification & Exhaust Emission Standards table on the next page. As discussed above, retrofitting the engine with an add-on control device to meet the current applicable Tier certification, which is Tier 4F, is not a cost effective option. Therefore, pursuant to District practice regarding equipment that was installed without an ATC permit, the installation of a Tier 2 certified IC engine satisfies BACT for NOx.

Title 13 CCR 2423

(December 2005)

Tier Certification & Exhaust Emission Standards

(grams per brake horsepower-hour)

Power Rating (hp)	Tier	Model Year	NO_x	HC	NMHC +NO_x	CO	PM
50 ≤ hp < 75	1	1998 – 2003	6.9	-	-	-	-
	2	2004 - 2007	-		5.6	3.7	0.3
	3	2008 - 2011			3.5		
	4*	2008 – 2012 (Interim)			3.5	3.7	0.22
75 ≤ hp < 100	1	1998 – 2003	6.9	-	-	-	-
	2	2004 – 2007	-		5.6	3.7	0.3
	3	2008 – 2011			3.5		
100 ≤ hp < 175	1	1997 – 2002	6.9	-	-	-	-
	2	2003 – 2006	-		4.9	3.7	0.22
	3	2007 – 2011			3.0		
175 ≤ hp < 300	1	1996 – 2002	6.9	1.0	-	8.5	0.4
	2	2003 – 2005	-	-	4.9	2.6	0.15
	3	2006 - 2010			3.0		
300 ≤ hp < 600	1	1996 – 2000	6.9	1.0	-	8.5	0.4
	2	2001 – 2005	-	-	4.8	2.6	0.15
	3	2006 – 2010			3.0		
600 ≤ hp ≤ 750	1	1996 – 2001	6.9	1.0	-	8.5	0.4
	2	2002 – 2005	-	-	4.8	2.6	0.15
	3	2006 – 2010			3.0		
> 750	1	2000 – 2005	6.9	1.0	-	8.5	0.4
	2	2006 – 2010	-	-	4.8	2.6	0.15

* Manufacturers may optionally certify engine families to the interim Tier 4 for this power category through 2012.

2. BACT Analysis for PM_{10} Emissions:

a. Step 1 - Identify all control technologies

The following PM_{10} control options are identified for this IC engine:

- 0.15 g/bhp-hr or the Latest EPA Tier Certification level for applicable horsepower range, whichever is more stringent. (ATCM) (Achieved in Practice – BACT 3.1.1 – last updated July 10, 2009

- 0.15 g/bhp-hr or the latest EPA Tier Certification level for applicable horsepower range, whichever is more stringent (ATCM) (Achieved in Practice – current BACT 3.1.1 – last updated 6/13/2019)

The latest EPA Tier Certification level for an engine of the proposed model year and horsepower rating is Tier 2. Refer to the Top-Down BACT analysis for NOx for a discussion regarding the determination of the EPA Tier level to be considered.

Please note the proposed Tier 2 IC engine has a PM emission factor of 0.10 g/hp-hr. Therefore, the proposed PM/PM_{10} emission factor of 0.10 g/hp-hr meets BACT requirements.

The latest applicable Tier certification level for a 755 bhp IC engine is Tier 4F, with an emission standard of 0.02 g-PM_{10}/bhp-hr.[5] Since the proposed engine has an emission rate of 0.1 g-PM_{10}/bhp-hr, it would need to be retrofitted with an add-control device in order to meet the latest Tier certification standard. The following add-on control device has been identified:

- Diesel Particulate Filter (DPF)

The DPF's primary function is to decrease the level of PM_{10} emissions produced by an engine. This is accomplished through the use of the DPF's porous filter which allows gases to pass through while capturing solid materials. Once the DPF is full, it ceases to function at full efficiency and must be regenerated. This means either burning off the excess carbon in the filter, cleaning it out, or replacing it. For emergency standby IC engines that frequently go through cold starts that do not reach temperatures high enough to burn off residual carbon, filters must be replaced or cleaned regularly.

b. Step 2 - Eliminate technologically infeasible options

The control option listed in Step 1 is not technologically infeasible.

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[5] https://ww2.arb.ca.gov/resources/documents/non-road-diesel-engine-certification-tier-chart

c. Step 3 - Rank remaining options by control effectiveness

No ranking needs to be done because there is only one control option identified under Step 1.

d. Step 4 - Cost Effectiveness Analysis

Diesel Particulate Filter (DPF)

(A). Emission Reduction:

Based on the PM_{10} potential emissions calculated in Section VII.C.2 of this evaluation and assuming a PM_{10} control efficiency of 85%[6] from the installation of a DPF system, the amount of PM_{10} emissions reduced is calculated as follows:

PM_{10} Emission Reductions = Annual $PE_{PM10} \times$ 1 tons/2,000 lb $\times$ Overall Control Eff.
= 8 lb/year $\times$ 1 tons/2,000 lb $\times$ 0.85
= **0.003 ton/year**

(B). Total Capital Cost Investment (TCI)

Based on ARB's 2010 article titled "Analysis of the Technical Feasibility and Costs of After-Treatment Controls on New Emergency Standby Engines", the average capital cost of installing a DPF on an engine is $39/hp which includes price of installation.

Based on the Consumer Price Index Inflation Calculator (https://www.bls.gov/data/inflation_calculator.htm), the average capital cost from 2010 is adjusted to $49 in July 2021.

DPF Capital Cost = Cost/hp x BHP rating = $49/hp x 755 bhp = $36,995

Total Capital Investment = **$36,995**

Annualized Capital Costs

Annualized Capital Investment = Total Capital Investment x Amortization Factor

Amortization Factor = $\frac{0.04(1.04)^{10}}{(1.04)^{10}-1}$ = 0.123 per District policy, amortizing over 10 years at 4%

Therefore, Annualized Capital Investment = $36,995 x 0.123 **= $4,550**

[6] Based on the aforementioned ARB document referenced in the NOx BACT analysis, a well-designed DPF system can reduce PM_{10} emissions up to 85%.

(C). Cost Effectiveness of a DPF with 85% Capture

Cost Effectiveness = Annualized Capital Costs ($/year) ÷ Emission Reduction (ton-PM_{10}/year) = $4,550/year÷ 0.003 ton-$PM_{10}$/year
= $1,516,666/ton-$PM_{10}$

The cost to operate a DPF with 85% capture efficiency is $1,516,666 per ton, which is greater than the District's PM_{10} cost-effectiveness threshold of $11,400/ton. Therefore, the PM_{10} control option is not cost effective and is being removed from consideration for this project.

e. Step 5 - Select BACT

BACT for PM_{10} is emissions of 0.15 g/hp-hr or less. The applicant is proposing an engine that meets this requirement. As discussed above, retrofitting the engine with an add-on control device to meet the current applicable Tier certification, which is Tier 4F, is not a cost effective option. Therefore, BACT will be satisfied for PM_{10}.

3. BACT Analysis for VOC Emissions:

a. Step 1 - Identify all control technologies

The following VOC control options are identified for this IC engine:

- Latest EPA Tier Certification level for applicable horsepower range (Achieved in Practice – BACT 3.1.1 – last updated July 10, 2009)

- Latest EPA Tier certification level for applicable horsepower range (Achieved in Practice – current BACT 3.1.1 – last updated 6/13/2019)

As indicated above, both versions of BACT Guideline 3.1.1 required latest EPA Tier certification level for applicable horsepower range. The only difference is that in 2010 the required certification level for this IC engine was Tier 2, whereas currently the engine would be required to meet Tier 4F certification level.

The emission standard for a 755 bhp Tier 4F IC engine is 0.14 g-VOC/bhp-hr.[7] Since the proposed engine has an emission rate of 0.2 g-VOC/bhp-hr, it would need to be retrofitted with an add-control device in order to meet the latest Tier certification standard. The following add-on control device has been identified:

- Diesel Oxidation Catalyst (DOC)

A DOC's primary function is to decrease the level of VOC emissions produced by an engine. DOCs generally consist of a precious metal coated flow-through honeycomb structure contained in a steel housing. Diesel fuel passes through this precious metal coating and a catalytic reaction occurs that breaks down the VOCs in the fuel into less harmful pollutants.

b. Step 2 - Eliminate technologically infeasible options

The control option listed in Step 1 is not technologically infeasible.

c. Step 3 - Rank remaining options by control effectiveness

No ranking needs to be done because there is only one control option identified under Step 1.

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[7] https://ww2.arb.ca.gov/resources/documents/non-road-diesel-engine-certification-tier-chart

d. Step 4 - Cost Effectiveness Analysis

Diesel Oxidation Catalyst (DOC)

(A). Emission Reduction:

Based on the VOC potential emissions calculated in Section VII.C.2 of this evaluation and assuming a VOC conversion efficiency of 50%[8] from the installation of a DOC system, the amount of VOC emissions reduction is calculated below:

VOC Emission Reductions = Annual PE_{VOC} × 1 tons/2,000 lb × Overall Control Eff.
= 17 lb/year × 1 tons/2,000 lb × 0.50
= **0.004 ton/year**

(B). Total Capital Cost Investment (TCI)

Based on ARB's 2010 document titled "Diesel Oxidation Catalyst General Information", the average capital cost of installing a DOC system on an engine is between $600 and $2,000 dollars depending on the size. For a conservative estimate, a DOC of $600 will be used.

Based on the Consumer Price Index Inflation Calculator (https://www.bls.gov/data/inflation_calculator.htm), the average capital cost from 2010 is adjusted to $752 in August 2021.

DOC Capital Cost = $752 = Total Capital Investment

Annualized Capital Costs

Annualized Capital Investment = Total Capital Investment x Amortization Factor

Amortization Factor = $\frac{0.04(1.04)^{10}}{(1.04)^{10}-1}$ = 0.123 per District policy, amortizing over 10 years at 4%

Therefore, Annualized Capital Investment = $752 x 0.123 **= $92**

(C). Cost Effectiveness of a DOC with 50% Capture

Cost Effectiveness = Annualized Capital Costs ($/year) ÷ Emission Reduction (ton-VOC/year) = $92/year÷ 0.004 ton-VOC/year
= $23,000/ton-VOC

[8] Based on the article, *Update On Emissions - Form 960, Second Edition, Waukesha Engine Division, Dresser Industries, October, 1991*, VOC reductions due to the installation of a catalyst are 50%.

As shown above, the capital cost of DOC system with 50% capture efficiency is $23,000 per ton, which is greater than the District's VOC cost-effectiveness threshold of $22,600/ton. Therefore, the VOC control option is not cost effective and is being removed from further consideration for this project.

e. Step 5 - Select BACT

BACT for VOC emissions from this emergency standby diesel IC engine was the Tier 2 certification level at the time of installation in 2010. As discussed above, retrofitting the engine with an add-on control device to meet the current applicable Tier certification, which is Tier 4F, is not a cost effective option. Therefore, pursuant to District practice regarding equipment that was installed without an ATC permit, the installation of a Tier 2 certified IC engine satisfies BACT for VOC.

Appendix C
Emissions Data Sheet

2021 EPA Tier 2 Exhaust Emission Compliance Statement
500DFEK
Stationary Emergency
60 Hz Diesel Generator Set

Compliance Information:

The engine used in this generator set complies with Tier 2 emissions limit of U.S. EPA New Source Performance Standards for stationary emergency engines under the provisions of 40 CFR 60 Subpart IIII.

Engine Manufacturer:	Cummins Inc.
EPA Certificate Number:	MCEXL015.AAJ-024
Effective Date:	06/10/2020
Date Issued:	06/10/2020
EPA Engine Family (Cummins Emissions Family):	MCEXL015.AAJ

Engine Information:

Model:	QSX/QSX15/QSX15-G/QSX15-G9	Bore:	5.39 in. (137 mm)
Engine Nameplate HP:	755	Stroke:	6.65 in. (169 mm)
Type:	4 Cycle, In-line, 6 Cylinder Diesel	Displacement:	912 cu. in. (15 liters)
Aspiration:	Turbocharged and CAC	Compression ratio:	17.0:1
Emission Control Device:	Electronic Control	Exhaust stack diameter:	8 in. (203 mm)

Diesel Fuel Emission Limits

D2 Cycle Exhaust Emissions

	Grams per BHP-hr			Grams per kWm-hr		
	NO_X + NMHC	CO	PM	NO_X + NMHC	CO	PM
Test Results	4.3	0.4	0.10	5.7	0.6	0.13
EPA Emissions Limit	4.8	2.6	0.15	6.4	3.5	0.20

Test methods: EPA emissions recorded per 40 CFR Part 60, 89, 1039, 1065 and weighted at load points prescribed in the regulations for constant speed engines.

Diesel fuel specifications: Cetane number: 40-50, Reference: ASTM D975 No. 2-D, 300-500 ppm Sulfur

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

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

Appendix D
RMR and AAQA

San Joaquin Valley Air Pollution Control District
Risk Management Review and Ambient Air Quality Analysis

To:	Dakota Ballard – Permit Services
From:	Emmanuel V Otaru – Technical Services
Date:	June 2, 2021
Facility Name:	MERCY MEDICAL CENTER MERCED
Location:	333 MERCY AVE, MERCED
Application #(s):	N-7718-5-0
Project #:	N-1211784

1. Summary

1.1 RMR

Units	Prioritization Score	Acute Hazard Index	Chronic Hazard Index	Maximum Individual Cancer Risk	T-BACT Required	Special Permit Requirements
5-0	N/A[1]	N/A[2]	0.00	1.11E-06	Yes	Yes
Project Totals	N/A[1]	N/A[2]	0.00	1.11E-06		
Facility Totals	>1	0.00	0.00	1.95E-06		

1. Prioritization for this unit was not conducted since the district determined that all diesel-fired IC engines will result in a prioritization score greater than one.
2. Acute Hazard Index was not calculated for Unit 1 since there is no risk factor or the risk factor is so low that it has been determined to be insignificant for this type of unit.

1.2 AAQA

Pollutant	Air Quality Standard (State/Federal)				
	1 Hour	3 Hours	8 Hours	24 Hours	Annual
CO	N/A		N/A		
NO_x	N/A				Pass
SO_x	N/A	N/A		NA	Pass
PM10				NA	Pass
PM2.5				NA	Pass
Ozone	NA		NA		

Notes:
1. Results were taken from the attached AAQA Report.
2. The project is an intermittent source as defined in APR-1920. In accordance with APR-1920, compliance with short-term (i.e., 1-hour, 3-hour, 8-hour and 24-hour) standards is not required.
3. The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2) unless otherwise noted.
4. Modeled PM10 concentrations were below the District SIL for non-fugitive sources of 1 $\mu g/m^3$ for the annual concentration.
5. Modeled PM2.5 concentrations were below the District SIL for non-fugitive sources of 0.2 $\mu g/m^3$ for the annual concentration.

1.3 Proposed Permit Requirements

To ensure that human health risks will not exceed District allowable levels; the following shall be included as requirements for:

Unit # 5-0

1. The PM_{10} emissions rate shall not exceed 0.10 g/bhp-hr based on US EPA certification using ISO 8178 test procedure.
2. The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction.
3. This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 50 hours per calendar year.

T-BACT is required for this unit because of emissions of Diesel Particulate Matter which is a PM10.

2. Project Description

Technical Services received a request on May 26, 2021 to perform a Risk Management Review (RMR) and Ambient Air Quality Analysis (AAQA) for the following:

- Unit -5-0: EMERGENCY IC ENGINE POWERING AN ELECTRICAL GENERATOR

3. RMR Report

3.1 Analysis

The District performed an analysis pursuant to the District's Risk Management Policy for Permitting New and Modified Sources (APR 1905, May 28, 2015) to determine the possible cancer and non-cancer health impact to the nearest resident or worksite. This policy requires that an assessment be performed on a unit by unit basis, project basis, and on a facility-wide basis. If a preliminary prioritization analysis demonstrates that:

- A unit's prioritization score is less than the District's significance threshold and;
- The project's prioritization score is less than the District's significance threshold and;
- The facility's total prioritization score is less than the District's significance threshold

Then, generally no further analysis is required.

The District's significant prioritization score threshold is defined as being equal to or greater than 1.0. If a preliminary analysis demonstrates that either the unit's or the project's or the facility's total prioritization score is greater than the District threshold, a screening or a refined assessment is required

If a refined assessment is greater than one in a million but less than 20 in one million for carcinogenic impacts (Cancer Risk) and less than 1.0 for the Acute and Chronic hazard indices(Non-Carcinogenic) on a unit by unit basis, project basis and on a facility-wide basis the proposed application is considered less than significant. For unit's that exceed a cancer risk of 1 in one million, Toxic Best Available Control Technology (TBACT) must be implemented.

Toxic emissions for this project were calculated using the following methods:

- Toxic emissions for the proposed unit were calculated and provided by the processing engineer.

These emissions were input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP). In accordance with the District's Risk Management Policy, risks from the proposed unit's toxic emissions were prioritized using the procedure in the 2016 CAPCOA Facility Prioritization Guidelines. The prioritization score for this proposed facility was greater than 1.0 (see RMR Summary Table). Therefore, a refined health risk assessment was required.

The AERMOD model was used, with the parameters outlined below and meteorological data for 2013-2017 from Merced (rural dispersion coefficient selected) to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid. These dispersion factors were input into the SHARP Program, which then used the Air Dispersion Modeling and Risk Tool (ADMRT) of the Hot Spots Analysis and Reporting Program Version 2 (HARP 2) to calculate the chronic and acute hazard indices and the carcinogenic risk for the project.

The following parameters were used for the review:

Source Process Rates					
Unit ID	**Process ID**	**Process Material**	**Process Units**	**Hourly Process Rate**	**Annual Process Rate**
5	1	PM_{10}	Lbs	0.17	8

Point Source Parameters						
Unit ID	**Unit Description**	**Release Height (m)**	**Temp. (°K)**	**Exit Velocity (m/sec)**	**Stack Diameter (m)**	**Vertical/ Horizontal/ Capped**
5	755 BHP DICE	3.05	756	93.79	0.15	Vertical

4. AAQA Report

The District modeled the impact of the proposed project on the National Ambient Air Quality Standard (NAAQS) and/or California Ambient Air Quality Standard (CAAQS) in accordance with District Policy APR-1925 (Policy for District Rule 2201 AAQA Modeling) and EPA's Guideline for Air Quality Modeling (Appendix W of 40 CFR Part 51). The District uses a progressive three level approach to perform AAQAs. The first level (Level 1) uses a very conservative approach. If this analysis indicates a likely exceedance of an AAQS or Significant Impact Level (SIL), the analysis proceeds to the second level (Level 2) which implements a more refined approach. For the 1-hour NO_2 standard, there is also a third level that can be implemented if the Level 2 analysis indicates a likely exceedance of an AAQS or SIL.

The modeling analyses predicts the maximum air quality impacts using the appropriate emissions for each standard's averaging period. Required model inputs for a refined AAQA include background ambient air quality data, land characteristics, meteorological inputs, a receptor grid, and source parameters including emissions. These inputs are described in the sections that follow.

Ambient air concentrations of criteria pollutants are recorded at monitoring stations throughout the San Joaquin Valley. Monitoring stations may not measure all necessary pollutants, so background data may need to be collected from multiple sources. The following stations were used for this evaluation:

Monitoring Stations				
Pollutant	**Station Name**	**County**	**City**	**Measurement Year**
CO	Modesto-14th Street	Stanislaus	Modesto	2018
NOx	Merced-Coffee	Merced	Merced	2018
PM10	2334 'M' ST.	Merced	Merced	2018
PM2.5	2334 'M' ST.	Merced	Merced	2018
SOx	Fresno - Garland	Fresno	Fresno	2018

Technical Services performed modeling for directly emitted criteria pollutants with the emission rates below:

Emission Rates (lbs/hour)						
Unit ID	**Process**	**NOx**	**SOx**	**CO**	**PM10**	**PM2.5**
5	1	N/A	N/A	N/A	N/A	N/A

Note: The project is an intermittent source as defined in APR-1920. In accordance with APR-1920, compliance with short-term (i.e., 1-hour, 3-hour, 8-hour and 24-hour) standards is not required.

Emission Rates (lbs/year)						
Unit ID	**Process**	**NOx**	**SOx**	**CO**	**PM10**	**PM2.5**
5	1	340	0	33	8	8

The AERMOD model was used to determine if emissions from the project would cause or contribute to an exceedance of any state of federal air quality standard. The parameters outlined below and meteorological data for 2013-2017 from Merced (rural dispersion coefficient selected) were used for the analysis:

The following parameters were used for the review:

Point Source Parameters						
Unit ID	**Unit Description**	**Release Height (m)**	**Temp. (°K)**	**Exit Velocity (m/sec)**	**Stack Diameter (m)**	**Vertical/ Horizontal/ Capped**
5	755 BHP DICE	3.05	756	93.79	0.15	Vertical

5. Conclusion

5.1 RMR

The cumulative acute and chronic indices for this facility, including this project, are below 1.0; and the cumulative cancer risk for this facility, including this project, is less than 20 in a million. However, the cancer risk for one or more units in this project is greater than 1.0 in a million. **In accordance with the District's Risk Management Policy, the project is approved with Toxic Best Available Control Technology (T-BACT).**

To ensure that human health risks will not exceed District allowable levels; the permit requirements listed on page 1 of this report must be included for this proposed unit.

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

5.2 AAQA

The emissions from the proposed equipment will not cause or contribute significantly to a violation of the State and National AAQS.

6. Attachments

A. Modeling request from the project engineer

B. Additional information from the applicant/project engineer

C. Facility Summary

D. AAQA results

Appendix E
QNEC Calculations

Quarterly Net Emissions Change (QNEC)

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

QNEC = PE2 - PE1, where:

QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr
PE2 = Post-Project Potential to Emit for each emissions unit, lb/qtr
PE1 = Pre-Project Potential to Emit for each emissions unit, lb/qtr

Since this is a new unit, PE1 = 0 for all pollutants. Thus, QNEC = PE2 (lb/qtr).

Using the PE2 (lb/yr) values calculated in Section VII.C.2, Quarterly PE2 is calculated as follows:

$PE2_{quarterly}$ = PE2 (lb/yr) ÷ 4 quarters/year = QNEC

QNEC		
Pollutant	PE2 Total (lb/yr)	Quarterly PE2 (lb/qtr)
NO_X	341	85.3
SO_X	0	0.0
PM_{10}	8	2.0
CO	33	8.3
VOC	17	4.3

Appendix F
SSPE1 Calculations

SSPE1 Calculations

Mercy Medical Center Merced owns and operates two 2,937 bhp Tier 2 certified diesel-fired engines (N-7718-1 and -2) as well as two 12.6 MMBtu/hr natural gas-fired boilers (N-7718-3 and -4). The emissions calculations for these emission units are as follows:

N-7718-1-0 & -2-0: 2,937 bhp Diesel-Fired Emergency IC engines

Assumptions

Non-emergency operating schedule:	50 hours/year
Density of diesel fuel:	7.1 lb/gal
Fuel heating value:	137,000 Btu/gal
BHP to Btu/hr conversion:	2,542.5 Btu/bhp-hr
Thermal efficiency of engine:	commonly ≈ 35%
PM_{10} fraction of diesel exhaust:	0.96 (CARB, 1988)
Conversion factor:	1.34 bhp/kw

Emissions factors

Diesel-fired IC Engine Emission Factors		
	g/bhp·hr	Source
NO_X	3.90	District Permitted Limit (N-7718-1-0 & -2-0)
SO_X	0.0051	Mass Balance Equation Below
PM_{10}	0.08	District Permitted Limit (N-7718-1-0 & -2-0)
CO	0.49	District Permitted Limit (N-7718-1-0 & -2-0)
VOC	0.25	District Permitted Limit (N-7718-1-0 & -2-0)

$$\frac{0.000015\ lb-S}{lb-fuel}\times\frac{7.1\ lb-fuel}{gallon}\times\frac{2\ lb-SO_2}{1\ lb-S}\times\frac{1\ gal}{137{,}000\ Btu}\times\frac{1\ bhp\ input}{0.35\ bhp\ out}\times\frac{2{,}542.5\ Btu}{bhp-hr}\times\frac{453.6\ g}{lb}=\ 0.0051\ \frac{g-SO_x}{bhp-hr}$$

PE Calculations

Annual PE (lb-pollutant/yr) = EF (g-pollutant/bhp-hr) x rating (bhp)
x operation (hr/yr) / 453.6 g/lb

Annual PE (N-7718-1-0 & -2-0)				
Pollutant	**Emissions Factor (g/bhp-hr)**	**Rating (bhp)**	**Annual Hours of Operation (hrs/year)**	**Annual PE (lb/yr)**
NO_x	3.90	2,937	50	**1,263**
SO_x	0.0051	2,937	50	**2**
PM_{10}	0.08	2,937	50	**26**
CO	0.49	2,937	50	**159**
VOC	0.25	2,937	50	**81**

N-7718-3-1 & -4-1: 12.6 MMBtu/hr Natural Gas Fired Boilers

Assumptions

Molar Weight of NOx: 46 lb-NOx/lb-mol
Molar Weight of CO: 28 lb-CO/lb-mol
Molar Weight of VOC: 16 (lb-VOC/lb-mol
Molar Specific Volume of Gas: 379.5 dscf/lb-mol at 60 ^{0}F
The maximum operating schedule is 24 hr/day and 8,760 hr/year (Project N-1072590)
The unit is fired solely on PUC-quality natural gas (per current permit)
F-Factor for Natural Gas: 8,578 dscf/MMBtu corrected to 60°F (Project N-1072590)

Emissions factors

Boiler ppmv Values		
	ppmvd at 3% O_2	Source
NO_X	9	District Permitted Limit (N-7718-3-1 & -4-1)
CO	100	District Permitted Limit (N-7718-3-1 & -4-1)
VOC	10	District Permitted Limit (N-7718-3-1 & -4-1)

The conversion equation for ppmvd to lb/MMBtu is:

$$EF\left(\frac{lb}{MMBtu}\right) = \frac{(ppmvd)\,x\left(F\text{-}factor\,\frac{dscf}{MMBtu}\right)x\left(MW\frac{lb}{lb\text{-}mole}\right)x\left(\frac{20.9}{20.9\text{-}3}\right)}{\left(Molar\ Specific\ Volume\ of\ gas\,\frac{dscf}{lb\text{-}mol}\right)x\left(10^6\right)}$$

Boiler Emission Factors			
	lb/MMBtu	ppmvd at 3% O_2	Source
NO_X	0.0109	9	Mass Balance Equation Above
SO_x	0.00285	-	District Policy APR 1720, Section II
PM_{10}	0.0076	-	AP-42 (07/98) Table 1.4-2
CO	0.0739	100	Mass Balance Equation Above
VOC	0.0042	10	Mass Balance Equation Above

PE Calculations

Annual PE (lb-pollutant/yr) = EF (lb/MMBtu) × Heat Input (MMBtu/hr) × Operating Schedule (hr/year)

Annual PE (N-7718-3-1 & -4-1)				
Pollutant	**Emissions Factor (lb/MMBtu)**	**Heat Input (MMBtu/hr)**	**Annual Hours of Operation (hrs/year)**	**Annual PE (lb/yr)**
NO_x	0.0109	12.6	8,760	**1,203**
SO_x	0.00285	12.6	8,760	**315**
PM_{10}	0.0076	12.6	8,760	**839**
CO	0.0739	12.6	8,760	**8,157**
VOC	0.0042	12.6	8,760	**464**

SSPE1 Calculations

SSPE1					
Permit Unit	NO_X	SO_X	PM_{10}	CO	VOC
N-7718-1-0 (IC Engine)	1,263	2	26	159	81
N-7718-2-0 (IC Engine)	1,263	2	26	159	81
N-7718-3-1 (Boiler)	1,203	315	839	8,157	464
N-7718-4-1 (Boiler)	1,203	315	839	8,157	464
Total	**4,932**	**634**	**1,730**	**16,632**	**1,090**

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

October 6, 2021

To: The Parents or Guardians of the Students Attending Kindergarten through 12th Grade Schools within ¼ mile of 315 Mercy Ave in Merced (Cruickshank Middle School)

Residents within 1,000 Feet of 315 Mercy Ave in Merced

Re: Public Notification Requirement of California Health and Safety Code §42301.6
Project Number: N-1211784
Project Description: 755 horsepower Tier 2 certified diesel engine to provide emergency power in the event of an electrical outage

Dear Parents/Residents:

The San Joaquin Valley Air Pollution Control District (Air District) has received an application from Mercy Medical Center Merced at 315 Mercy Ave in Merced, CA for the following project:

755 horsepower Tier 2 certified diesel engine to provide emergency power in the event of an electrical outage

Since this project is located within 1,000 feet of the outer bounds of a school site, the California Health & Safety Code §42301.6 requires that you be given this notification and an opportunity to comment on the project before permits are issued.

The Air District has determined that, as proposed, the installation will comply with all Air District regulations. The Air District's analysis of the proposal has determined that the emissions from operation of this equipment will not pose a significant health risk to the school children or to the surrounding public.

Should you have any questions or comments about this project, please submit them in writing within 30 days of the date of this notice to the following:

San Joaquin Valley Air Pollution Control District
Attn: Dakota Ballard
1990 E Gettysburg Ave
Fresno, CA 93726

You may also contact Dakota Ballard at (559) 230-5865.

Samir Sheikh
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: (661) 392-5500 FAX: (661) 392-5585

www.valleyair.org www.healthyairliving.com

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

6 de Octubre, 2021

Para: **Los padres o guardianes de los estudiantes asistiendo escuelas del kinder al grado 12 dentro de un cuarto de milla de 315 Mercy Ave en Merced: Cruickshank Middle School**

Residentes dentro de 1,000 pies de 315 Mercy Ave en Merced

ASUNTO: **Aviso público requerido por el Código de la Salud y Seguridad de California (Sección 42301.6)**
Número del proyecto: N-1211784
Descripción del proyecto: Un motor de combustión interna de diésel de 755 caballos de fuerza que es certificado Nivel 2 para apoderar un generador eléctrico durante apagones eléctricos

Estimados Padres/Residentes:

El Distrito para el Control de la Contaminación del Aire del Valle de San Joaquín (Distrito del Aire) ha recibido una solicitud de Mercy Medical Center Merced ubicado en 315 Mercy Ave en Merced, CA para el siguiente proyecto:

> Un motor de combustión interna de diésel de 755 caballos de fuerza que es certificado Nivel 2 para apoderar un generador eléctrico durante apagones eléctricos

Como este proyecto está ubicado dentro de 1,000 pies del exterior de un sitio escolar, la sección §42301.6 del Código de la Salud y Seguridad de California requiere que se les de este aviso y la oportunidad para comentar sobre el proyecto antes de que los permisos sean otorgados.

El Distrito del Aire ha determinado que, como propuesto, la instalación cumplira con todas las regulaciones del Distrito del Aire. El analisis por el Distrito del Aire sobre el propuesto proyecto, ha determinado que las emisiones del uso del equipo no resultara en un riesgo significante a la salud de los estudiantes o del público alrededor.

Si usted tiene preguntas o comentarios sobre este proyecto, por favor sométalos por escrito dentro de 30 días de la fecha de este aviso a la siguiente dirección:

San Joaquin Valley Air Pollution Control District
Attn: Dakota Ballard
1990 E. Gettysburg Ave.
Fresno, CA 93726

También se puede comunicar con Dakota Ballard al (559) 230-5865.

Samir Sheikh
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: (661) 392-5500 FAX: (661) 392-5585

www.valleyair.org www.healthyairliving.com

HEALTH AND SAFETY CODE

H&S 42301.6 Permit Approval: Powers & Duties of APCO

42301.6 (a) Prior to approving an application for a permit to construct or modify a source which emits hazardous air emissions, which source is located within 1,000 feet from the outer boundary of a schoolsite, the air pollution control officer shall prepare a public notice in which the proposed project or modification for which the application for a permit is made is fully described. The notice may be prepared whether or not the material is or would be subject to subdivision (a) of Section 25536, if the air pollution control officer determines and the administering agency concurs that hazardous air emissions of the material may result from an air release, as defined by Section 44303. The notice may be combined with any other notice on the project or permit which is required by law.

(b) The air pollution control officer shall, at the permit applicant's expense, distribute or mail the public notice to the parents or guardians of children enrolled in any school that is located within one-quarter mile of the source and to each address within a radius of 1,000 feet of the proposed new or modified source at least 30 days prior to the date final action on the application is to be taken by the officer. The officer shall review and consider all comments received during the 30 days after the notice is distributed, and shall include written responses to the comments in the permit application file prior to taking final action on the application.

(1) Notwithstanding Section 49073 of the Education Code, or any other provision of law, the information necessary to mail notices required by this section shall be made available by the school district to the air pollution control officer.

(2) Nothing in this subdivision precludes, at the discretion of the air pollution control officer and with permission of the school, the distribution of the notices to the children to be given to their parents or guardians.

(c) Notwithstanding subdivision (b), an air pollution control officer may require the applicant to distribute the notice if the district had such a rule in effect prior to January 1, 1989.

(d) The requirements for public notice pursuant to subdivision (b) or a district rule in effect prior to January 1, 1989, are fulfilled if the air pollution control officer or applicant responsible for giving the notice makes a good faith effort to follow the procedures prescribed by law for giving the notice, and, in these circumstances, failure of any person to receive the notice shall not affect the validity of any permit subsequently issued by the officer.

(e) Nothing in this section shall be deemed to limit any existing authority of any District.

(f) An applicant for a permit shall certify whether the proposed source or modification is located within 1,000 feet of a school site. Misrepresentation of this fact may result in the denial of a permit.

(g) The notice requirements of this section shall not apply if the air pollution control officer determines that the application to construct or modify a source will result in a reduction or equivalent amount of air contaminants, as defined in Section 39013, or which are hazardous air emissions.

(h) As used in this section:

(1) "Hazardous air emissions" means emissions into the ambient air of air contaminants which have been identified as a toxic air contaminant by the state board or by the air pollution control officer for the jurisdiction in which the project is located. As determined by the air pollution control officer, hazardous air emissions also means emissions into the ambient air from any substances identified in subdivisions (a) to (f), inclusive, of Section 44321 of the Health and Safety Code.

(i) "Acutely hazardous material" means any material defined pursuant to subdivision (a) of Section 25532.

(amended by Stats. 1991, Ch 1183, Sec. 14.)