777 12th Street, 3rd Floor SACRAMENTO METROPOLITAN Sacramento, CA 95814

AIR QUALITY
MANAGEMENT DISTRICT

AUTHORITY TO CONSTRUCT EVALUATION

APPLICATION NO.: A/C 25120
REVIEW STARTING DATE: 01/13/17
ISSUING ENGINEER: Joe Carle

I. PROJECT DESCRIPTION:

FACILITY NAME: Folsom Cordova Unified School District

LOCATION: 1970 Broadstone Pkwy., Folsom, CA 95630

PROPOSAL: Authority to Construct and Permit to Operate a diesel-fired emergency standby generator.

INTRODUCTION: Folsom Cordova Unified School District is a public school district for schools in the cities of Folsom and Rancho Cordova. Folsom Cordova Unified School District is seeking an Authority to Construct and a Permit to Operate a diesel fired emergency standby generator which will be installed at Vista del Lago High School located at 1970 Broadstone Pkwy., Folsom.

EQUIPMENT DESCRIPTION: Emergency standby engine.

Make:	Generac
Model:	D3400T-Gen1
Serial No.:	TBD
Engine Hp:	85 bhp
Fuel Type:	Diesel
Displacement:	207.5 in^3
Engine Family:	FKMCL3.41D43
Model Year:	2016

PROCESS RATE/FUEL USAGE:

Equipment	Diesel Fuel Usage		
	Gallons/Hour (A)	Gallons/Day	Gallons/Quarter
Engine – D3400T-Gen1 – 85 HP	4.32	104	864

(A) Based on full standby load operation and using submitted Manufacturer Data.

OPERATING SCHEDULE: This application is for a stand-by emergency engine. For purposes of establishing the applicable BACT determination and for ensuring compliance with the ATCM for Stationary Compression Ignition Engines (Title 17, CCR, §93115), engine operation will be limited to 50 hours per year for maintenance and 24 hours per day, 200 hours per quarter and 200 hours per year for total use (maintenance and actual emergency operation). Twenty four

hours a day is reasonable because it is an emergency engine and may in fact operate 24 hours per day.

CONTROL EQUIPMENT EVALUATION: The engine is certified to Tier 3 non-road emission standards.

II. EMISSIONS CALCULATIONS:

1. **HISTORIC POTENTIAL EMISSIONS:** The equipment is being evaluated as a new emission unit; therefore its Historic Potential Emissions are as follows (Rule 202, §225):

HISTORIC POTENTIAL EMISSIONS		
Pollutant	**Daily Historic Potential Emissions**	**Quarterly Historic Potential Emissions**
VOC	0 lb/day	0 lb/qtr
NOx	0 lb/day	0 lb/qtr
SOx	0 lb/day	0 lb/qtr
PM10	0 lb/day	0 lb/qtr
PM2.5	0 lb/day	0 lb/qtr
CO	0 lb/day	0 lb/qtr

2. **PROPOSED POTENTIAL TO EMIT:** This application is for a stand-by emergency engine. During emergency episodes it can operate for up to 24 hr/day and for a maximum of 200 hours in a quarter or year, including both maintenance and emergency. Therefore, its Potential to Emit will be calculated assuming the engine operates (i) 24 hours per day, (ii) 200 hours per calendar quarter, and (iii) 200 hours per year.

   Emissions are calculated using the following equation:

$$PTE = \frac{EF * HP * Hrs}{U_{CF}}$$

   Where

   PTE = Potential to Emit (lb/day, lb/qtr, lb/yr)
   EF = Emission Factor (g/hp-hr)
   HP = Horse Power of engine
   Hrs = Maximum hours of operation (hrs/day, hrs/qtr, hrs/yr)
   U_{CF} = Unit conversion factor (453.6 g/lb)

Pollutant	Emission Factors (A) (g/hp-hr)	Potential to Emit (B)		
		lb/day	lb/quarter	lb/year
VOC (C)	1.14	5.1	43	43
NOx (C)	3.5	15.7	131	131
SOx	0.005	0.0	0	0
PM10	0.17	0.8	6	6
PM2.5	0.17	0.8	6	6
CO	3.7	16.6	139	139
GHG	519	1.2 tons/day	10 tons/qtr	10 tons/year
Lead	N/A	N/A	N/A	N/A

(A) Emission factors for VOC and NOx are based on the District's BACT standards (Tier 3 standard). CO emission factor is based on the certified level for a Tier 3 engine. PM10 and PM2.5 emission factors include both the condensable portion and the filterable portion of the particulates. The filterable portion is based on the PM certification standard and the condensable portion is derived using the condensable to filterable fraction, taken from AP-42, Table 3.4-2 (10/96), multiplied by the certification standard ((0.15 g/hp-hr + 0.15 g/hp-hr *0.0077/0.0496)=0.17 g/hp-hr). SOx emission factor is based on AP-42, Table 3.3-1 (10/96) using a fuel sulfur content of 15 ppm. GHG emission factor is expressed as CO2e and is from EPA's Mandatory Reporting of Greenhouse Gases Rule (78 FR 71948, Nov. 29, 2013), Tables C-1 & C-2.

(B) Emissions are based on 85 bhp, 24 hours/day, 200 hours/quarter and 200 hours/year of operation. All emission limits are in English units.

(C) The engine is required to comply with the combined NOx + VOC emission standard. For the purpose of calculating NOx and VOC individually, VOC emissions are assessed at the worst case scenario of the uncontrolled AP-42 emission factor of 1.14 g/bhp-hr and NOx emissions are assessed at the worst case limit of 3.5 g/bhp-hr.

III. COMPLIANCE WITH RULES AND REGULATIONS:

1. **H&S § 42301.6 (AB 3205) COMPLIANCE:** The engine will be located on the grounds of Vista del Lago High School. There are no other K-12 schools within ¼ mile radius of the source. The Vista del Lago High School is located at 1970 Broadstone Pkwy. A public notice will be distributed to the parents or guardians of the children that attend the school and all residents within 1000 feet of the engines pursuant to the provisions of Health & Safety Code § 42301.6.

2. **NSR COMPLIANCE:**

   Rule 202 - New Source Review

   Section 301 - Best Available Control Technology

   BACT is triggered for any pollutant for which the emission increase ($BACT_{EI}$) calculated pursuant to Rule 202, Section 411.1 exceeds the levels specified below. For purposes of this calculation, the difference is done using tenths, then the difference is rounded to an integer using standard rounding convention (round up if greater than or equal to 0.5):

   BACT is triggered if:

$BACT_{EI} > BACT_{TL}$

Where:

$BACT_{EI}$ = Emissions Increase = (DPE – DHPE)
DPE = Daily Potential Emissions (from Section II.2)
DHPE = Daily Historic Potential Emissions (from Section II.1)

$BACT_{TL}$ =

Pollutant	$BACT_{TL}$
VOC	0 lb/day
NOx	0 lb/day
SOx	0 lb/day
CO	550 lb/day
PM_{10}	0 lb/day
$PM_{2.5}$	0 lb/day
Lead	3.3 lb/day

Determination of BACT Applicability:

Pollutant	DPE (lb/day)	DHPE	$BACT_{EI}$ (lb/day)	$BACT_{TL}$ (lb/day)	Is BACT Required?
VOC	5.1	0	5	>0	Yes
NOx	15.7	0	16	>0	Yes
SOx	0.0	0	0	>0	No
PM10	0.8	0	1	>0	Yes
PM2.5	0.8	0	1	>0	Yes
CO	16.6	0	17	>550	No
Lead	0	0	0	>3.3	No

The proposed NOx, VOC, PM10, and PM2.5 emissions exceed the BACT trigger levels specified in this section and are therefore subject to BACT.

SMAQMD's BACT Determination for standby IC engines with a rating of greater or equal to 50 BHP (BACT No. **116**) was last reviewed on **02/11/16**. Since less than two years have passed since the time the of the last BACT review and the time the application was deemed complete, and the SMAQMD is not aware of any significant changes to BACT requirements for engines in this size category, this BACT determination will be considered current and valid for this permit application.

Determination of Compliance with BACT Requirements:

BACT Compliance		
Pollutant	District BACT Standard BACT No. **116** (g/hp-hr)	Manufacturer's Emissions Data (A) (g/hp-hr)
VOC + NOx (C)	3.5	3.19
SOx	0.005 Fuel with < 0.0015% sulfur content by weight	Not applicable, This engine does not trigger BACT
PM10 (B)	0.15	0.11
PM2.5 (B)	0.15	0.11
CO	3.7	Not applicable, This engine does not trigger BACT

(A) Based on Generac Statement of Exhaust Emissions 2016 Generac Fueled Generator for engine model D3400T-Gen1. The District does not use manufacturer's data as BACT because the data is for an engine family and it is not engine specific and does not account for degradation, variability and other factors.

(B) Based on filterable PM only.

(C) For purposes of VOC and NOx compliance the District uses the VOC+NOx certification standard for standby engines.

The manufacturer's emissions data for the Generac D3400T-Gen1 diesel engine for VOC, NOx, SOx, PM10, and PM2.5 demonstrate compliance with the BACT standards. The permit will require that the owner/operator only use fuel that contains less than 0.0015% sulfur by weight (CARB Diesel Fuel), which meets the BACT standard for SOx.

Section 302 - Offsets Emergency electrical generating, flood control, and firefighting equipment are exempt from the requirement to provide emission offsets by Section 110 provided the following conditions are met:

1. The installation of the equipment will not result in a major modification or be a major stationary source, in and of itself, and
2. Operation for maintenance purposes is limited to 100 hours per year (engine will be limited to 50 hours per year for T-BACT compliance), and such maintenance must be scheduled in cooperation with the District so as to limit air quality impact, and
3. Operation of the equipment must be limited to a total of 200 hours per year, and
4. The equipment is not used to supply power to a serving utility for distribution on the grid, and
5. Operation is limited to maintenance operation, emergency operation to supply power when there is an actual interruption of electrical power from the serving utility or emergency water pumping for flood control, firefighting, potable water pumping, or sewage pumping.

Conditions will be placed on the Authority to Construct and Permit to Operate indicating these limitations.

The following are the permitted emission units at the Stationary Source and the criteria pollutant quarterly permitted emissions:

All units at this facility/stationary source were installed after January 1, 1977.

STATIONARY SOURCE POTENTIAL TO EMIT FOR VOC AND NO_X (SAME FOR ALL 4 QUARTERS)

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NOx
P/O 21398	Boiler (1.44 MMBTU/hr)	17	116
P/O 21399	Boiler (1.44 MMBTU/hr)	17	116
A/C 25120	IC Engine Standby (85 BHP)	43	131
Total		77	363
Offset Trigger Level		≥5,000	≥5,000

Emissions offsets are not required for VOC or NOx because emissions are below the offset threshold.

STATIONARY SOURCE POTENTIAL TO EMIT FOR SO_X, PM10, PM2.5, AND CO (SAME FOR ALL 4 QUARTERS)

Permit No.	Emissions Unit	Stationary Source Cumulative Emission Increase Since 01-01-77			
		ton/year	lb/quarter		
		PM2.5	SOx	PM10	CO
P/O 21398	Boiler (1.44 MMBTU/hr)	0.012	2	24	941
P/O 21399	Boiler (1.44 MMBTU/hr)	0.012	2	24	941
A/C 25120	IC Engine Standby (85 BHP)	0.003	0	6	139
Total		0.027	4	54	2,021
Offset Trigger Level		≥ 15	≥ 13,650	≥ 7,300	≥ 49,500

Emission offsets are not required for SOx, PM10, PM2.5 or CO because emissions are below the offset threshold.

Section 308 –CEQA The California Environmental Quality Act (CEQA) is a statute that requires state and local agencies to identify the significant adverse environmental impacts of their actions and to avoid or mitigate those impacts to the extent feasible. The first step in the review of projects subject to CEQA is to determine if the project is exempt from CEQA.

The State CEQA Guidelines (SCG) provides that, "Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA." (SCG §15061(b)(3)) Based on the environmental analysis below staff have concluded that the project is exempt from CEQA because there is no possibility that the project will have a significant adverse effect on the environment.

As shown in the table below, the project's operational phase emissions, or permitted emission limits are well below the SMAQMD Thresholds of Significance.

Pollutant/Hazard		Threshold	Project Total (B)	Rounded Project Total	Less than Standard?
NOx (ozone precursor)		65 lb/day	0.7 lb/day	1 lb/day	Yes
VOC (ozone precursor)		65 lb/day	0.2 lb/day	0 lb/day	Yes
PM10 (A)	Daily	82 lb/day	0.03 lb/day	0 lb/day	Yes
	Annual	15 tons/year	0.001 tons/year	0 tons/year	Yes
PM2.5 (A)	Daily	80 lb/day	0.03 lb/day	0 lb/day	Yes
	Annual	14.6 tons/year	0.001 tons/year	0 tons/year	Yes
Cancer Risk (per million)		10 per million	1.0 (C)	1	Yes
Acute Non-Cancer Health Hazard		1.0	N/A (C)	N/A	Yes
Chronic Non-Cancer Health Hazard		1.0	7.4E-04 (C)	0	Yes
GHG as CO2e	Operational Phase	10,000 tons/year	2.2 tons/year	2 tons/year	Yes

(A) (A) Operational phase CEQA significance threshold for PM10 and PM2.5 is zero (0) for projects that fail to apply all feasible BACT. The thresholds for projects that apply all feasible BACT is 82 lb/day and 15 ton/year for PM10 and 80 lb/day and 14,6 ton/year for PM2.5. The District uses conventional rounding methods to determine what numbers round to zero. For BACT purposes the District has determined that an emissions level of 0.49 lb/day rounds to 0. Using this same methodology, the emissions from this operation are rounded to 0 lb PM10, PM2.5/day and 0 ton PM10, PM2.5/year.

(B) For emergency equipment, operational phase emissions are based on predicable maintenance operation and does not include unforeseen emergency episodes. Typical daily maintenance hours on emergency engines are one hour/day.

(C) Refer to Rule Compliance Section (Rule 402 Nuisance) for health risk analysis.

In addition to the exemption from CEQA for a project that demonstrates no possibility of a significant effect on the environment, CEQA review is also exempt for permitting actions that are considered ministerial. Under the District "Guidance Document, Permit Actions and CEQA Applicability," section 5.1.1(f), issuance of an ATC is considered ministerial unless it requires the establishment of a new BACT standard. This project does not require a new BACT standard but rather relied on an existing BACT standard published in the District's BACT Clearinghouse (No. **116**), thus making the permitting action ministerial and exempt from CEQA.

Therefore, upon approval of the project, the SMAQMD will issue the Authority to Construct and file a Notice of Exemption with the Sacramento County Clerk. The notice will be posted for 35 days and the evaluation and Authority to Construct will be made available for public

inspection.

Section 406 – Submittal of BACT Determinations: This permit action relied on an existing BACT determination already published on SMAQMD's BACT Clearinghouse. Therefore, this section does not apply.

Rule 203 – Prevention of Significant Deterioration

A source or modification triggers PSD if:

- Its potential to emit any one pollutant is greater than or equal to 100 tons/year if it is one of the 28 selected industrial categories in 42 U.S.C. Section 7479 (1), or greater than or equal to 250 tons/year for all other categories; or
- It is part of a major stationary source and the project's net emissions increase for any pollutant will be greater than the significance levels listed below:

Pollutant	**Level of Significance (Tons/Yr)**
CO	100
NOx	40
SOx	40
PM	25
PM10	15
PM2.5	10 (PM2.5) or 40 (SO2) or 40(NO)
Ozone	40 of NOx or VOCs
Lead	0.6
Fluorides	3
Sulfuric acid mist	7
H_2S	10
Total reduced sulfur (including H_2S)	10
Reduced sulfur compounds (including H_2S)	10
Greenhouse Gases (CO2e)	75,000

There are no emissions sources at the facility that appear to have the potential to emit over 100 or 250 tons per year, and as demonstrated in Section II.2, the emissions from this engine are so low they would not cause the facility to exceed the threshold when analyzed cumulatively. Since this is not a major source, it is not necessary to consider the major modification significance levels, but nonetheless, Section II.2 indicates that annual emissions are well below the levels of significance.

Rule 214 – Federal New Source Review

This rule does not apply because this permit action is not for a new major stationary source or a modification at an existing major stationary source.

Rule 217 – Public Notice Requirements for Permits

Sections 401-402 – CARB, EPA, and Public Notification: The public noticing requirements

of Rule 217 do not apply if:

- Offsets are not required under Rule 202, Section 302.
- A visibility analysis is not required under Rule 214, Section 413.
- The increase in potential to emit for the project, calculated under Section 403 of Rule 217, is below the following limits:

Pollutant	lb/qtr
VOC	5,000
NOx	5,000
SOx	9,200
PM10	7,300
PM2.5	10 TPY
CO	49,500

Analysis:

- As determined in Section III.2, offsets are not required.
- This permit action is not subject to Rule 214, so the visibility analysis required by Section 413 of Rule 214 is inapplicable.
- As shown below, the increase in potential to emit does not exceed the notification exemption thresholds.

Increase in Potential to Emit					
Pollutant	Potential to Emit for the Project		Increase in PTE	Notification Threshold	Notification Required?
	Pre-Application	Post-Application			
VOC	0	43 lb/qtr	43 lb/qtr	≥ 5,000	No
NOx	0	131 lb/qtr	131 lb/qtr	≥ 5,000	No
SOx	0	0 lb/qtr	0 lb/qtr	≥ 9,200	No
PM10	0	6 lb/qtr	6 lb/qtr	≥ 7,300	No
PM2.5	0	0.00 TPY	0.00 TPY	≥ 10 TPY	No
CO	0	139 lb/qtr	139 lb/qtr	≥ 49,500	No

3. PROHIBITORY RULE COMPLIANCE:

Rule 401 - Ringelmann Chart

The permit will include conditions requiring that the IC engine comply with the Ringelmann No. 1 or 20% opacity standard and in the District's experience, properly maintained engines are able to meet the requirement. The equipment will be inspected prior to the issuance of the permit to operate and on a regular basis thereafter to ensure continuous compliance.

Rule 402 – Nuisance

The District regulates emissions of toxics substances for engines under Rule 402, SMAQMD's guidance document, Health Risk Management Programs For Existing, Modified and New Stationary Sources (March 24, 2016) and ATCM's adopted by CARB.

The health risk action levels and results are summarized below. Additional modeling and HRA information can be found in Attachment HRA.

Health Risk Action Levels and Assessment Summary				
Type of Health Risk	Permitting Thresholds(A)		Project HRA Results(B)	
	T-BACT	Maximum	Residential	Worker/School
Cancer Risk (Chances per Million)	≥ 1.0	10.0	0.2	1.0
Acute Non-Cancer (Hazard Index)	≥ 1.0	1.0	NA	NA
Chronic Non-Cancer (Hazard Index)	≥ 1.0	1.0	6.2E-05	7.4E-04

(A) In certain circumstances, the District may allow a health risk in excess of the levels specified here. For more information, see SMAQMD's guidance document, Health Risk Management Programs for Existing, Modified and New Stationary Sources (2016).
(B) Results have been rounded to one decimal place.

The following factors, formulas, and assumptions were taken into consideration in order to estimate the worst case excess cancer risk and the non-cancer health risks for the toxic pollutants emitted.

The project's toxic emissions are modeled with the use of an EPA approved air dispersion model to determine the concentrations of toxic pollutants at residential and non-residential receptors surrounding the project. The model used for this analysis is Lakes Environmental's AERMOD View, Version 8.8.9. The following parameters were used as inputs to the model for each engine:

Release Height:	4 feet
Gas Exit Temperature:	925 °F
Stack Diameter:	2.5 in.
Gas Exit Flow Rate:	380 acfm
Nominal Emission Rate:	1.0 g/s

SMAQMD utilizes the California Air Resources Board's Hotspots Analysis and Reporting Program (HARP2), Version 16088 model which incorporates the health risk assessment methodologies from the "Risk Assessment Guidelines - Guidance Manual for Preparation of Health Risk Assessments" (February 2015).

CANCER RISK ASSESSMENT:

From equation 5.4.1.1 and 8.2.4 A:

$$Riskair = Cair * (BR/BW) * A * EF * CPF * ED/AT * (1E-06) * (GLC) * ASF * FAH$$

Where:

Riskair	= Cancer risk from inhalation exposure
Cair	= Concentration ($\mu g/m^3$)
(BR/BW)	= Breathing Rate/Body Weight
	= 361 (l/kg-day) 95%, 3rd Trimester

	= 1090 (l/kg-day) 95%, 0<2 yrs
	= 631 (l/kg-day) 80%, 2<9 yrs
	= 572 (l/kg-day) 80%, 2<16 yrs
	= 261 (l/kg-day) 80%, 16<30 yrs
	= 233 (l/kg-day) 80%, 16<70 yrs
	= 230 (l/kg-day) 8 hr worker rate
A	= Inhalation Absorption Factor (default = 1)
EF	= Exposure Frequency
	= 350 days for Res
	= 245 days for Non-Res
CPF	= Cancer Potency Factor (kg-day/mg)
ED	= Exposure Duration, 30 years Res, 25 years Non-Res
AT	= Averaging Time, 25,550 days
ASF	= Age sensitivity factor for a specified age group
FAH	= Fraction of time spent at home (use 1 for children under 16 when a school is within a 1 in a million cancer risk isopleth)
	= 0.85, 3rd Trimester
	= 0.85, 0<2 yrs
	= 0.72, 2<9 yrs
	= 0.72, 2<16 yrs
	= 0.73, 16<30 yrs
	= 0.73, 16<70 yrs
(1E-06)	= (mg/1000 ug)*(m^3/1000 l)
GLC	= Ground Level Adjustment Factor
	= 1.0 for resident
	= 4.2 (7/5 x 24/8) for worker for equipment that, although limited, operates during normal work hours

NON-CANCER RISK ASSESSMENT:

The chronic non-cancer health risk is determined for a given pollutant by dividing the pollutant's annual average ambient air concentration (ug/m^3) by the chronic reference exposure level of that pollutant in order to obtain the chronic hazard index (HI). The acute non-cancer health risk is determined by dividing the pollutant's maximum hourly ambient air concentration (ug/m^3) by the acute reference exposure level in order to obtain the acute hazard index (HI). In addition, each contaminant can affect different organs of the body and several compounds may affect common organs. Therefore, when there are multiple toxic compounds involved, the effects are additive for the common organs.

A list of chronic or acutely hazardous air contaminants may be found at the OEHHA website www.oehha.ca.gov. The method of calculating the HI numbers (Risk Assessment Guidelines) is also found at this website.

HRA CONCLUSION: The health risk for this project is considered acceptable to the SMAQMD because:

- The evaluated cancer risk for a maximum exposed individual resident (MEIR) is 0.2 in one million, which is below the maximum permitting threshold.
- The evaluated cancer risk for a maximum exposed individual worker (MEIW) is 1.0 in one million, which is below the maximum permitting threshold.
- The evaluated noncancer Acute Hazard Index is less than one for all cases.
- The evaluated noncancer Chronic Hazard Index is less than one for all cases.
- Since the cancer risk equals 1 in one million, T-BACT will be required. The District's

BACT determination No. 116 sets T-BACT for diesel particulate matter as meeting the applicable emissions standard for the horsepower range based on the ATCM for Stationary Compression Ignited Engines. Additionally, the ATCM restricts engine operation for the purposes of maintenance or testing while school is in session (7:30 am – 3:30 pm) and whenever there is a school sponsored activity.

Rule 406 - Specific Contaminants
The proposed equipment is not expected to exceed the emissions limit of 0.2% by volume sulfur compound as SO_2 and 0.1 gr/dscf for combustion contaminants calculated to 12% CO_2.

Diesel Fuel F-Factor	=	9190 dscf/mmBTU
Molar Volume	=	385.3 ft3/mol
Diesel HHV	=	19,300 BTU/lb
Conversion Factor	=	15.432 gr/g
PM10 Emission Factor	=	0.17 g/hp-hr
SO_2 Emission Factor	=	0.005 g/hp-hr
BSFC	=	7000 BTU/hp-hr
Weight % C in Diesel	=	87 % or 0.87 lb C/lb fuel
C to CO_2 Conversion Efficiency	=	0.99

PM10 Concentration (combustion contaminants):

A. Calculate uncorrected grain loading
= (0.17 g/hp-hr) x (15.432 gr/g) x (hp-hr/7000 BTU) x (1E6 BTU/mmBTU) x (mmBTU/9190 dscf)
= 0.04078097 gr/dscf

B. Calculate CO_2 emission factor (lb CO_2/mmbtu) assuming 100% C to CO_2 conversion
= (0.87 lb C/lb fuel) x (mol C/12 lb C) x (mol CO_2/mol C) x (44 lb CO_2/mol CO_2) x (lb fuel/19300 BTU) x (1E6 BTU/mmBTU)
= 165.2849741 lb CO_2/mmBTU

C. Calculate lb CO_2/mmBTU at 99% Conversion
= 165.2849741 lb CO_2/mmBTU x 99%
= 163.6321244 lb CO_2/mmBTU

D. Calculate volume % of CO_2 in Exhaust Gas
= % CO_2
= mol CO_2/mol exhaust
= (163.6321244 lb CO_2/mmBTU) x (mol CO_2/44 lb CO_2) x (mmBTU/9190 dscf) x (385.3 dscf/mol exhaust)
= 0.155919125 mol CO_2/mol exhaust or 15.5919125 % CO_2

E. Calculate corrected grain loading
= (0.04078097 gr/dscf) x (12% CO_2/15.5919125% CO_2)
= 0.031 gr/dscf corrected to 12% CO_2

OR

Simplified Equation

= (0.17 g/hp-hr) x (15.432 gr/g) x (hp-hr/7000 BTU) x (0.12 mol CO_2/mol exhaust) x (lb fuel/0.87 lb C) x (12 lb C/mol C) x (mol C/mol CO_2) x (19300 BTU/lb fuel) / (0.99) x (mol exhaust/385.3 dscf)

= 0.031 gr/dscf corrected to 12% CO_2

SO_2 Concentration (% SO_2 by volume):

The following calculation is at 0% excess air which represents worst case.
= (0.005 g/hp-hr) x (lb SO_2/453.6 g) x (hp-hr/7000 BTU) x (1E6 BTU/mmBTU) x (mmBTU/9190 dscf) x (mol SO_2/64 lb SO_2) x (385.3 dscf/mol exhaust)
= 0.000001032 mol SO_2/mol exhaust or 0.0001032 % SO_2

The rule emission limits for SO_2 and PM are 0.2% SO_2 by volume and 0.1 grains/cf at 12% CO_2, respectively. Therefore, the emissions from the engine comply with Rule 406.

Rule 420 - Sulfur Content of Fuels
This rule limits the sulfur content of fuel. It was last amended in 1981, and CARB has subsequently adopted more stringent standards, which limit the sulfur content of diesel no. 2 motor fuel @ <0.0015%S. The permit will include conditions limiting the use of fuel to CARB-approved fuels or alternative fuels that comply with the CARB regulations, which will ensure compliance with this Rule.

4. NSPS COMPLIANCE:
The list of all adopted New Source Performance Standards as listed in 40 CFR 60 (http://yosemite.epa.gov/r9/r9nsps.nsf/ViewStandards?ReadForm&Part=60) were reviewed to determine if the proposed project is subject to one or more of these regulations. One applicable provision was identified:

SUBPART IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines are applicable to any of the following:

A. Engines with a displacement of less than 30 liters per cylinder where the model year is 2007 or later for non-fire pump engines and the model year listed in Table 3 of this subpart for fire pump engines.
B. Owners or operators of engines that commence construction after July 11, 2005 where the engine is manufactured after April 1, 2006 for a non-fire pump engine or for engines manufactured as a certified National Fire Protection Association (NFPA) fire pump after July 1, 2006.
C. Owners and operators of engines that modify or reconstruct their engine after July 11, 2005.

The engine was manufactured in 2016 and has a displacement of less than 30 liters per cylinder, therefore, the engine is subject to subpart IIII.

NSPS requirements and Analysis:

A. The engine must meet the non-road standard in Table 1 of 40 CFR 60.89.112 that is applicable to the engine size and year of manufacture. The engine meets this requirement because it has been certified to the tier 3 standard.
B. The fuel used must meet the requirements specified in 40 CFR 80.510(b). The engine meets this requirement because the permit will be conditioned to limit fuels used to CARB diesel and CARB diesel complies with the federal fuel specification.
C. The engine must have an hour meter installed. The permit will include a condition requiring an hour meter.
D. This NSPS limits engine operation for maintenance purposes to 100 hours per year. The permit will include a condition limiting engine operation to 50 hours per year for maintenance purposes.

5. NESHAP COMPLIANCE:

NESHAPs under 40 CFR, Part 61: The list of all adopted National Emission Standards for Hazardous Air Pollutants (http://yosemite.epa.gov/r9/r9nsps.nsf/ViewStandards?ReadForm&Part=61) were reviewed to determine if the proposed project is subject to one or more of these regulations. There are currently no 40 CFR, Part 61 NESHAPs applicable to this source category.

NESHAPs under 40 CFR, Part 63: The District has not requested nor obtained delegation of Part 63 NESHAPs. However, these NESHAPS are being enforced as state Air Toxic Control Measures (ATCMs) pursuant to Health and Safety Code, Sections 39658(b) and 39666(d). The list of all adopted National Emission Standards for Hazardous Air Pollutants (http://yosemite.epa.gov/r9/r9nsps.nsf/ViewStandards?ReadForm&Part=63) were reviewed to determine if the proposed project is subject to one or more of these regulations. One applicable provision was identified:

Subpart ZZZZ – National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at both major and area sources of HAP emissions.

The engine is subject to this part because it is considered a new RICE since construction will be commenced after June 12, 2006 at an area source.

The requirements of this NESHAP subpart require the engine to comply with the emission requirements specified in 40 CFR 60 Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines). As mentioned above this engine complies with these requirements because it is certified to the appropriate standard, will utilize CARB diesel, and will have an hour meter installed.

6. ATCM COMPLIANCE: The list of all adopted Airborne Toxic Control Measures (http://www.arb.ca.gov/toxics/atcm/atcm.htm) was reviewed to determine if the proposed project is subject to one or more of these regulations.

Airborne Toxic Control Measure For Stationary Compression Ignition Engines (Title 17, CCR Sections 93115-93115.15: The engine is stationary, greater than 50 hp, utilizes a compression ignition power cycle, and is therefore subject to this rule. To comply with this rule, the permit will contain conditions requiring that the engine meet a PM emission rate of 0.15 g/hp-hr or less, limit other criteria pollutants to EPA Tier 3 levels, operate no more than 50 maintenance hours per year and 200 total hours per year, monitor usage with a non-resetting 4 digit totalizer, and operate with CARB verified diesel fuel. The operator will be required to maintain monthly records that document operating hours and fuel deliveries.

IV. RECOMMENDATION: This engine will comply with all applicable District rules and regulations. An authority to construct a diesel fired emergency standby engine generator should be issued to Folsom Cordova Unified School District with the following conditions.

Refer to conditions in Authority to Construct No. A/C 25120

REVIEWED BY: _____ **DATE:** _____

APPROVED BY: _____ **DATE:** _____

Attachment A
Engine PTE Calculation Spreadsheet and Engine Emission Certification

Attachment HRA
Health Risk Assessment Supporting Documents

Attachment NOE
CEQA Notice of Exemption