

# AIR QUALITY

## MANAGEMENT DISTRICT

### DRAFT AUTHORITY TO CONSTRUCT EVALUATION

<b>APPLICATION NO.:</b>	<u>A/Cs 25780, 25781, &amp; 25782</u>
<b>REVIEW STARTING DATE:</b>	<u>7/24/18</u>
<b>ISSUING ENGINEER:</b>	<u>Jeffrey Quok</u>

#### I. PROJECT DESCRIPTION:

**FACILITY NAME:** Prime Data Centers DBA SVO Building One LLC

**LOCATION:** 2407 AK St., McClellan Park, CA 95652

**PROPOSAL:** Authorities to Construct and Permits to Operate three identical diesel-fired emergency standby generators.

**INTRODUCTION:** Prime Data Centers DBA SVO Building One LLC is a company that houses computer systems for computer data storage. Prime Data Centers DBA SVO Building One LLC is seeking Authorities to Construct and Permits to Operate three identical diesel fired emergency standby generator which will be installed at 2407 AK St., McClellan Park. In order to not exceed SMAQMD's CEQA Thresholds of Significance for NOx, the applicant has accepted a daily maintenance operational limit of 1.3 hours per day for all engines combined. In order to not exceed SMAQMD's cancer risk permitting threshold, all engines will have a combined maintenance operational limit of 59.5 hours per year, with no single engine exceeding 50 hours/year per T-BACT. Lastly, this project exceeds the public notification exemption thresholds for NOx and therefore will require a 30 day public review period.

**EQUIPMENT DESCRIPTION:** Emergency standby engine.

#### A/C 25780

Make: Caterpillar  
Model: C175-16  
Serial No.: TBD  
Engine Hp: 4,423 bhp  
Fuel Type: Diesel  
Displacement: 5,167 in<sup>3</sup>  
Engine Family: GCPXL106.NZS  
Model Year: 2018

#### A/C 25781

Make: Caterpillar  
Model: C175-16  
Serial No.: TBD  
Engine Hp: 4,423 bhp  
Fuel Type: Diesel  
Displacement: 5,167 in<sup>3</sup>  
Engine Family: GCPXL106.NZS  
Model Year: 2018

#### A/C 25782

Make: Caterpillar  
Model: C175-16  
Serial No.: TBD  
Engine Hp: 4,423 bhp  
Fuel Type: Diesel  
Displacement: 5,167 in<sup>3</sup>  
Engine Family: GCPXL106.NZS  
Model Year: 2018

**PROCESS RATE/FUEL USAGE:**

For each engine:

Equipment	Diesel Fuel Usage		
	Gallons/Hour (A)	Gallons/Day	Gallons/Quarter
Engine – C175-16 – 4,423 HP	214.2	5,140.8	42,840

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

**OPERATING SCHEDULE:** This application is for three stand-by emergency engines. For purposes of establishing the applicable BACT determination, for ensuring compliance with the ATCM for Stationary Compression Ignition Engines (Title 17, CCR, §93115), staying below SMAQMD’s CEQA Thresholds of Significance, and ensuring an acceptable cancer risk, operation of each engine will be limited to 1.3 hours per day, 50 hours per quarter, and 50 hours per year (59.5 hours/year combined total for all engines) 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 they are emergency engines and may in fact operate 24 hours per day.

**CONTROL EQUIPMENT EVALUATION:** The engines are certified to Tier 2 non-road emission standards.

**II. EMISSIONS CALCULATIONS:**

**1. HISTORIC POTENTIAL EMISSIONS:** The equipment is being evaluated as new emission units; therefore the Historic Potential Emissions for each engine is 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 three identical stand-by emergency engines. During emergency episodes they 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, their Potential to Emit will be calculated assuming the engines operate (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<sub>CF</sub> = Unit conversion factor (453.6 g/lb)

Emissions from each engine:

Pollutant	Emission Factors (A) (g/hp-hr)	Potential to Emit (B)		
		lb/day	lb/quarter	lb/year
VOC (C)	0.32	74.9	624	624
NOx (C)	4.8	1,123.3	9,361	9,361
SOx	0.005	1.2	10	10
PM10	0.17	40.6	338	338
PM2.5	0.17	40.6	338	338
CO	2.6	608.5	5,071	5,071
GHG	519	60.8 tons/day	508 tons/qtr	508 tons/year
Lead	N/A	N/A	N/A	N/A

- (A) The emission factor for NOx is based on the District's BACT standards (Tier 2 standard). CO emission factor is based on the certified level for a Tier 2 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  $((0.15 \text{ g/hp-hr} + 0.15 \text{ g/hp-hr} * 0.0077/0.0496) = 0.17 \text{ g/hp-hr})$ . SOx emission factor is based on AP-42, Table 3.4-1 (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 4,423 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 0.32 g/bhp-hr and NOx emissions are assessed at the worst case limit of 4.8 g/bhp-hr.

### III. COMPLIANCE WITH RULES AND REGULATIONS:

**1. H&S § 42301.6 (AB 3205) COMPLIANCE:** The engines are not located within 1,000 feet from the outer boundary of a school site. Therefore the school public noticing requirements of H&S Code § 42301.6 do not apply.

**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<sub>EI</sub>) 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
		PM10	0 lb/day
		PM2.5	0 lb/day
		Lead	3.3 lb/day

Determination of BACT Applicability:

For Each Engine:

Pollutant	DPE (lb/day)	DHPE	$BACT_{EI}$ (lb/day)	$BACT_{TL}$ (lb/day)	Is BACT Required?
VOC	74.9	0	75	>0	Yes
NOx	1,123.3	0	1,123	>0	Yes
SOx	1.3	0	1	>0	Yes
PM10	40.6	0	41	>0	Yes
PM2.5	40.6	0	41	>0	Yes
CO	608.5	0	609	>550	Yes
Lead	0	0	0	>3.3	No

The proposed NOx, VOC, SOx, PM10, PM2.5, and CO 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. **172**) was last reviewed on **04/10/18**. 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:

<b>BACT Compliance Standby IC Engines with a Rating of Greater or Equal to 50 BHP</b>		
Pollutant	District BACT Standard BACT No. 172 (g/hp-hr)	Manufacturer's Emissions Data (A) (g/hp-hr)
VOC + NOx (C)	4.8	4.38
SOx	0.005 Fuel with < 0.0015% sulfur content by weight	0.005 Fuel with < 0.0015% sulfur content by weight
PM10 (B)	0.15	0.14
PM2.5 (B)	0.15	0.14
CO	2.6	1.62

- (A) Based on Caterpillar Performance Data Sheet: DM8448. 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 Caterpillar diesel engines for VOC, NOx, SOx, PM10, PM2.5, and CO 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: Offsets are triggered for any project where the stationary source potential to emit, calculated pursuant to Rule 202, Section 411.3 exceeds the levels specified below.

<u>Pollutant</u>	<u>lb/qtr</u>
VOC	5,000
NOx	5,000
SOx	13,650
PM10	7,300
PM2.5	15 TPY
CO	49,500

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

**CALCULATION OF OFFSET TRIGGER LEVEL FOR VOC AND NO<sub>x</sub> (SAME FOR ALL 4 QUARTERS)**

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NO <sub>x</sub>
A/C 25035	I.C. Standby Engine, 4,423 HP	624	9,361
A/C 25036	I.C. Standby Engine, 4,423 HP	624	9,361
A/C 25780	I.C. Standby Engine, 4,423 HP	624	9,361
A/C 25781	I.C. Standby Engine, 4,423 HP	624	9,361
A/C 25782	I.C. Standby Engine, 4,423 HP	624	9,361
Total		3,120	46,805 (A)
Offset Trigger Level		≥5,000	≥5,000

(A) The max quarterly Potential to Emit (PTE) of 23.4 tons/year is equal to the max annual PTE, which is below the major source thresholds.

Emissions offsets are not required for VOC because emissions are below the offset threshold. Emission offsets for NO<sub>x</sub> exceed the offset threshold. However, emission offsets will not be required because emergency electrical generating equipment are exempt from offset requirements as explained below.

**CALCULATION OF OFFSET TRIGGER LEVEL FOR SO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, AND CO (SAME FOR ALL 4 QUARTERS)**

Permit No.	Emissions Unit	Stationary Source Potential to Emit			
		ton/year	lb/quarter		
		PM2.5	SO <sub>x</sub>	PM10	CO
A/C 25035	I.C. Standby Engine, 4,423 HP	0.17	10	338	5,071
A/C 25036	I.C. Standby Engine, 4,423 HP	0.17	10	338	5,071
A/C 25780	I.C. Standby Engine, 4,423 HP	0.17	10	338	5,071
A/C 25781	I.C. Standby Engine, 4,423 HP	0.17	10	338	5,071
A/C 25782	I.C. Standby Engine, 4,423 HP	0.17	10	338	5,071
Total		0.85	50	1,690	25,355
Offset Trigger Level		≥ 15	≥ 13,650	≥ 7,300	≥ 49,500

Emission offsets are not required for SO<sub>x</sub>, PM10, PM2.5 or CO because emissions are below the offset threshold.

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 (each 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 Authorities to Construct and Permits to Operate indicating these limitations.

**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 (D)	Rounded Project Total (B)	Less than Standard?
NOx (ozone precursor)		65 lb/day	60.8 lb/day	61 lb/day	Yes
VOC (ozone precursor)		65 lb/day	4.1 lb/day	4 lb/day	Yes
PM10 (A)	Daily	80 lb/day	2.2 lb/day	2 lb/day	Yes
	Annual	14.6 tons/year	0.04 tons/year	0 tons/year	Yes
PM2.5 (A)	Daily	82 lb/day	2.2 lb/day	2 lb/day	Yes
	Annual	15 tons/year	0.04 tons/year	0 tons/year	Yes
Cancer Risk (per million)		10	9.9 (C)	10 (C)	Yes
Acute Non-Cancer Health Hazard		1.0	N/A (C)	N/A (C)	N/A
Chronic Non-Cancer Health Hazard		1.0	0.0076 (C)	0 (C)	Yes

Pollutant/Hazard		Threshold	Project Total (D)	Rounded Project Total (B)	Less than Standard?
GHG as CO2e	Operational Phase	10,000 metric tons/year	137 metric tons/year	137 metric tons/year	Yes

- (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 80 lb/day and 14.6 ton/year for PM10 and 82 lb/day and 15 ton/year for PM2.5.
- (B) 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.
- (C) See Health Risk Assessment analysis under Rule 402 in Sec. 3. Prohibitory Rule Compliance.
- (D) For emergency equipment, operational phase emissions are based on predictable maintenance operation and do not include unforeseen emergency episodes. For these emergency engines, daily maintenance hours is limited to 1.3 hours/day and annual maintenance hours are limited to 59.5 hours/year for all engines combined. GHG emissions were converted from US tons to metric tons by using the conversion of 0.907 metric ton/US ton.

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 SMAQMD’s BACT Clearinghouse (No. 172), 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



Pollutant	Level of Significance (Tons/Yr)
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 <sub>2</sub> S	10
Total reduced sulfur (including H <sub>2</sub> S)	10
Reduced sulfur compounds (including H <sub>2</sub> S)	10
Greenhouse Gases (CO <sub>2</sub> e)	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 these engines 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 exceed the notification exemption thresholds.

The applicant previously proposed the first phase of this project under A/Cs 25035 and 25036. The increase in the potential to emit for the full project will combine emissions from these 3

new engines (A/Cs 25780, 25781, and 25782).

<b>Increase in Potential to Emit (A)</b>					
Pollutant	Potential to Emit for the Project		Increase in PTE	Notification Threshold	Notification Required?
	Pre-Application	Post-Application			
VOC	0	3,120 lb/qtr	3,120 lb/qtr	≥ 5,000	No
NOx	0	46,805 lb/qtr	46,805 lb/qtr	≥ 5,000	Yes
SOx	0	50 lb/qtr	50 lb/qtr	≥ 9,200	No
PM10	0	1,690 lb/qtr	1,690 lb/qtr	≥ 7,300	No
PM2.5	0	0.85 TPY	0.85 TPY	≥ 10 TPY	No
CO	0	25,355 lb/qtr	25,355 lb/qtr	≥ 49,500	No

(A) Combine emissions for A/Cs 25035, 25036, 25780, 25781, and 25782.

Emissions from the equipment exceed the exemption levels specified in Section 110 and require public noticing per Section 401 of this rule. A notice declaring a 30 day public review period concerning the District's preliminary decision to issue Authorities to Construct will be published in the Sacramento Bee.

### 3. PROHIBITORY RULE COMPLIANCE:

#### Rule 401 - Ringelmann Chart

The permit will include conditions requiring that the IC engines 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.

This health risk assessment includes emissions for all 5 proposed engines (A/Cs 25035, 25036, 25780, 25781, and 25782). The health risk action levels and results are summarized below.

<b>Health Risk Action Levels and Assessment Summary</b>				
Type of Health Risk	Permitting Thresholds <sup>(A)</sup>		Project HRA Results <sup>(B)</sup>	
	T-BACT	Maximum	Residential	Worker
Cancer Risk (Chances per Million)	≥ 1.0	10.0	0.6	9.9
Acute Non-Cancer (Hazard Index)	≥ 1.0	1.0	NA	NA
Chronic Non-Cancer (Hazard Index)	≥ 1.0	1.0	1.5E-04	7.6E-03

(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.

Diesel particulate matter (PM) has been identified as a carcinogen by the Office of Environmental Health Hazard Assessment (OEHHA).

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 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:

A/C 25035

Release Height: 24 feet  
Gas Exit Temperature: 862 °F  
Stack Diameter: 22 in.  
Gas Exit Flow Rate: 24,158 acfm  
Nominal Emission Rate: 1.0 g/s

A/C 25036

Release Height: 24 feet  
Gas Exit Temperature: 862 °F  
Stack Diameter: 22 in.  
Gas Exit Flow Rate: 24,158 acfm  
Nominal Emission Rate: 1.0 g/s

A/C 25780

Release Height: 24 feet  
Gas Exit Temperature: 862 °F  
Stack Diameter: 22 in.  
Gas Exit Flow Rate: 24,158 acfm  
Nominal Emission Rate: 1.0 g/s

A/C 25781

Release Height: 24 feet  
Gas Exit Temperature: 862 °F  
Stack Diameter: 22 in.  
Gas Exit Flow Rate: 24,158 acfm  
Nominal Emission Rate: 1.0 g/s

A/C 25782

Release Height: 24 feet  
Gas Exit Temperature: 862 °F  
Stack Diameter: 22 in.  
Gas Exit Flow Rate: 24,158 acfm  
Nominal Emission Rate: 1.0 g/s

To reduce the cancer risk, the project was modeled using variable emission factors to limit the run times between 7:00 AM to 7:00 PM. The permit will have conditions limiting maintenance operation between 7:00 AM to 7:00 PM.

The original project model from A/Cs 25035 & 25036 assumed all engines operated with equal maintenance hours. For flexibility, the applicant requested shared maintenance hours between the engines. To create a worst-case scenario for shared maintenance hours between the engines, the two engine locations with the highest risk dispersion models were identified. The engine (A/C 25036) with the greatest health risk is assumed to operate the full 50 hours of allowable maintenance and the remaining 9.5 hours that resulted in acceptable cancer risk went to the engine (A/C 25035) with the second greatest risk. A/Cs 25035 & 25036 will be revised to include the shared maintenance hour limits.

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:

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

Where:

Riskair	= Cancer risk from inhalation exposure
Cair	= Concentration ( $\mu\text{g}/\text{m}^3$ )
(BR/BW)	= Breathing Rate/Body Weight = 361 (l/kg-day) 95%, 3 <sup>rd</sup> 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 = 250 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, 3 <sup>rd</sup> 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 <sup>3</sup> /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

**CANCER RISK SUMMARY:**

Permit No.	Receptor (Worst Case)	TAC	Excess Cancer Risk (risk in a million)
A/Cs 25035, 25036, 25780, 25781, 25782	Residential (Located at Receptor #2751, UTM: 638291, 4278699)	Diesel Exhaust	0.6
	Non-Residential (Located at Receptor #2173, UTM: 638621, 4278488)	Diesel Exhaust	9.9

**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<sup>3</sup>) 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<sup>3</sup>) 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](http://www.oehha.ca.gov). The method of calculating the HI numbers (Risk Assessment Guidelines) is also found at this website.

The hazard index for the organs affected are shown below:

Toxic Air Pollutant	Target Organ Affects – Acute HI (Residential)									
	Alimentary Tract	Cardiovascular	Developmental	Eye	Hematologic	Immune	Nervous	Reproductive	Respiratory	Skin
Diesel Exhaust	X	X	X	X	X	X	X	X	X	X

Toxic Air Pollutant	Target Organ Affects – Chronic HI (Residential)												
	Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
Diesel Exhaust	X	X	X	X	X	X	X	X	X	X	X	1.5E-04	X

Toxic Air Pollutant	Target Organ Affects – Acute HI (Non-Residential)									
	Alimentary Tract	Cardiovascular	Developmental	Eye	Hematologic	Immune	Nervous	Reproductive	Respiratory	Skin
Diesel Exhaust	X	X	X	X	X	X	X	X	X	X

Toxic Air Pollutant	Target Organ Affects – Chronic HI (Non-Residential)												
	Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
Diesel Exhaust	X	X	X	X	X	X	X	X	X	X	X	7.6E-03	X

**NON-CANCER RISK SUMMARY:**

Permit No.	Receptor (Worst Case)	TAC	Chronic Hazard Index
A/Cs 25035, 25036, 25780, 25781, 25782	Residential (Located at Receptor #2751, UTM: 638291, 4278699)	Diesel Exhaust	1.5E-04
	Non-Residential (Located at Receptor #2173, UTM: 638621, 4278488)	Diesel Exhaust	7.6E-03

**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 0.6 in one million, which is below the significant risk threshold.
- The evaluated cancer risk for a maximum exposed individual worker (MEIW) is 9.9 in one million, which is below the significant risk threshold. However, since the cancer risk exceeds 1 in one million, T-BACT will be required. SMAQMD has determined that the installation of Tier 2 engines with a Diesel PM emission factor below 0.15 g/bhp-hr meets T-BACT for PM.
- The evaluated noncancer Acute Hazard Index is less than one for the maximum exposed individual resident (MEIR) and the maximum exposed individual worker (MEIW).
- The evaluated noncancer Chronic Hazard Index is less than one for the maximum exposed individual resident (MEIR) and the maximum exposed individual worker (MEIW).

**Rule 406 - Specific Contaminants**

The proposed equipment is not expected to exceed the emissions limit of 0.2% by volume sulfur compound as SO<sub>2</sub> and 0.1 gr/dscf for combustion contaminants calculated to 12% CO<sub>2</sub>.

Diesel Fuel F-Factor	=	9190 dscf/mmBTU
Molar Volume	=	385.3 ft <sup>3</sup> /mol
Diesel HHV	=	19,300 BTU/lb
Conversion Factor	=	15.432 gr/g
PM10 Emission Factor	=	0.17 g/hp-hr
SO <sub>2</sub> Emission Factor	=	0.0055 g/hp-hr
BSFC	=	7000 BTU/hp-hr
Weight % C in Diesel	=	87 % or 0.87 lb C/lb fuel
C to CO <sub>2</sub> 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<sub>2</sub> emission factor (lb CO<sub>2</sub>/mmbtu) assuming 100% C to CO<sub>2</sub> conversion  
 = (0.87 lb C/lb fuel) x (mol C/12 lb C) x (mol CO<sub>2</sub>/mol C) x (44 lb CO<sub>2</sub>/mol CO<sub>2</sub>) x (lb fuel/19300 BTU) x  
 (1E6 BTU/mmBTU)  
 = 165.2849741 lb CO<sub>2</sub>/mmBTU
- C. Calculate lb CO<sub>2</sub>/mmBTU at 99% Conversion  
 = 165.2849741 lb CO<sub>2</sub>/mmBTU x 99%  
 = 163.6321244 lb CO<sub>2</sub>/mmBTU
- D. Calculate volume % of CO<sub>2</sub> in Exhaust Gas  
 = % CO<sub>2</sub>  
 = mol CO<sub>2</sub>/mol exhaust  
 = (163.6321244 lb CO<sub>2</sub>/mmBTU) x (mol CO<sub>2</sub>/44 lb CO<sub>2</sub>) x (mmBTU/9190 dscf) x (385.3 dscf/mol exhaust)  
 = 0.155919125 mol CO<sub>2</sub>/mol exhaust or 15.5919125 % CO<sub>2</sub>
- E. Calculate corrected grain loading  
 = (0.04078097 gr/dscf) x (12% CO<sub>2</sub>/15.5919125% CO<sub>2</sub>)  
 = 0.031 gr/dscf corrected to 12% CO<sub>2</sub>

**OR**

**Simplified Equation**

$$= (0.17 \text{ g/hp-hr}) \times (15.432 \text{ gr/g}) \times (\text{hp-hr}/7000 \text{ BTU}) \times (0.12 \text{ mol CO}_2/\text{mol exhaust}) \times (\text{lb fuel}/0.87 \text{ lb C})$$

$$\times (12 \text{ lb C/mol C}) \times (\text{mol C/mol CO}_2) \times (19300 \text{ BTU/lb fuel}) / (0.99) \times (\text{mol exhaust}/385.3 \text{ dscf})$$

$$= 0.031 \text{ gr/dscf corrected to 12\% CO}_2$$

**SO<sub>2</sub> Concentration** (% SO<sub>2</sub> by volume):

The following calculation is at 0% excess air which represents worst case.

$$= (0.0055 \text{ g/hp-hr}) \times (\text{lb SO}_2/453.6 \text{ g}) \times (\text{hp-hr}/7000 \text{ BTU}) \times (1\text{E}6 \text{ BTU/mmBTU}) \times (\text{mmBTU}/9190 \text{ dscf})$$

$$\times (\text{mol SO}_2/64 \text{ lb SO}_2) \times (385.3 \text{ dscf/mol exhaust})$$

$$= 0.000001135 \text{ mol SO}_2/\text{mol exhaust or } 0.0001135 \text{ \% SO}_2$$

The rule emission limits for SO<sub>2</sub> and PM are 0.2% SO<sub>2</sub> by volume and 0.1 grains/cf at 12% CO<sub>2</sub>, respectively. Therefore, the emissions from the engines 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 engines were manufactured in 2018 and have a displacement of less than 30 liters per cylinder, therefore, the engines are subject to subpart IIII.

NSPS requirements and Analysis:

- A. The engines 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 engines meet this requirement because they have been certified to the tier 2 standard.
- B. The fuel used must meet the requirements specified in 40 CFR 80.510(b). The engines meet 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 engines 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 each 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 engines are 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 engines 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 these engines comply with these requirements because they are 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 engines are stationary, greater than 50 hp, utilize a compression ignition power cycle, and are therefore subject to this rule. To comply with this rule, the permit will contain conditions requiring that the engines meet a PM emission rate of 0.15 g/hp-hr or less, limit other criteria pollutants to EPA Tier 2 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:** These engines will comply with all applicable District rules and regulations. Authorities to construct three diesel fired emergency standby engines should be issued to Prime Data Centers DBA SVO Building One LLC with the following conditions.

***Refer to conditions in Authority to Construct Nos. 25780, 25781, & 25782***

**REVIEWED BY:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**APPROVED BY:** \_\_\_\_\_ **DATE:** \_\_\_\_\_