

**San Joaquin Valley Air Pollution Control District**  
**Authority to Construct Application Review**  
**Stationary Diesel-Fired Irrigation Pump IC Engine**  
**DRAFT**

Facility Name: \_\_\_\_\_ Date: June 1, 2016  
Mailing Address: \_\_\_\_\_ Engineer: \_\_\_\_\_  
Lead Engineer: \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
ATC Application #(s): \_\_\_\_\_  
ATC Project #: \_\_\_\_\_  
Deemed Complete: \_\_\_\_\_

**I. PROPOSAL**

**\*\*\*\*\*Prior to proceeding with this application review, determine if the facility will remain subject to District permitting requirements after the engine replacements by determining the post project emissions. If facility will no longer be subject to permits, an ATC process is not necessary. In this case, the engine may require a Permit-Exempt Equipment Registration (PEER).\*\*\*\*\***

**Note: This GEAR is only to be used for new (manufactured after 4/1/06) replacement stationary agricultural irrigation compression-ignited IC engines at non-Major Sources.** It is also important to verify that prior to processing this application review, determine if the replacement engine is the latest available tier certification for that power rating (see FYI 324 for determination assistance).

Facility name has requested Authority to Construct (ATC) permits to replace # existing stationary diesel-fired IC engines powering agricultural irrigation booster pumps. The existing IC engines were permitted as units X-XXXX-X thru X-XXXX-X. (If applicable, replace the previous sentence with: The facility did not obtain permits for the existing IC engines.)

Each of the # new engines is a Tier X certified Make/Model diesel fired IC engine. The replacement proposals have been summarized in the table below:

Existing Engines		New Engines	
PTO #	Max Power Rating (bhp)	ATC #	Max Power Rating (bhp)
X-XXXX-X	###	X-XXXX-X	###
X-XXXX-X	###	X-XXXX-X	###
X-XXXX-X	###	X-XXXX-X	###

## II. APPLICABLE RULES

Rule 2010	Permits Required (12/17/92)
Rule 2020	Exemptions (8/18/11)
Rule 2201	New and Modified Stationary Source Review Rule (8/15/19)
Rule 2520	Federally Mandated Operating Permits (8/15/19)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4002	National Emissions 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 4202	Particulate Matter Emission Rate (12/17/92)
Rule 4301	Fuel Burning Equipment (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
California Code of Regulations (CCR), Title 17 (Public Health), Division 3 (Air Resources), Chapter 1 (Air Resources Board), Subchapter 7.5 (Air Toxic Control Measures), Measure 93115 (Stationary Diesel Engines)	
California Code of Regulations (CCR), Title 17 (Public Health), Division 3 (Air Resources), Chapter 1 (Air Resources Board), Subchapter 7.5 (Air Toxic Control Measures), Measure 93116 (Portable Diesel 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

### *(With a street address)*

The facility is located at [1990 E Gettysburg in Fresno, CA](#). The equipment is not 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 not applicable to this project.

### *(With a Mount Diablo Base Meridian Location)*

The equipment will be located within the [SW/4 of Section 31, Township 29S, Range 21E](#). The equipment is not 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 not applicable to this project.

### *(With a descriptive location)*

The site is located [on the eastern side of 25<sup>th</sup> Avenue, approximately one mile south of State Route \(SR\) 198, in Kings County](#). The equipment is not 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 not applicable to this project.

#### IV. PROCESS DESCRIPTION

The primary function of this facility is agricultural (growing of crops and/or raising of fowl or animals). The proposed stationary IC engine(s) will power an agricultural irrigation well pump.

#### V. EQUIPMENT LISTING

PTO Equipment Description (Existing Engine to be Replaced):

X-XXX-X-X: PASTE EQUIPMENT DESCRIPTION FROM PTO HERE

ATC Equipment Description:

Note, the continuous rating shall be identified in the equipment descriptions, per FYI 275 (*Use of Horsepower and Load Factor for IC Engines*)

X-XXX-X-X: XXX BHP (CONTINUOUS) MAKE/MODEL/SERIAL TIER X CERTIFIED DIESEL-FIRED IC ENGINE POWERING AN AGRICULTURAL IRRIGATION PUMP (REPLACEMENT FOR PERMIT UNIT X-XXXX-X)

PTO Equipment Description:

X-XXX-X-X: XXX BHP (CONTINUOUS) MAKE/MODEL/SERIAL TIER X CERTIFIED DIESEL-FIRED IC ENGINE POWERING AN AGRICULTURAL IRRIGATION PUMP

#### VI. EMISSION CONTROL TECHNOLOGY EVALUATION

Internal combustion engines production air contaminants such as sulfur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOC), carbon monoxide (CO), particulate matter 10 microns or less in aerodynamic diameter (PM<sub>10</sub>).

Very low sulfur diesel fuel (0.0015% sulfur by weight maximum) reduces SO<sub>x</sub> emissions by over 99% from standard diesel fuel. <sup>1</sup> This fuel is readily available and is considered AIP.

NO<sub>x</sub>, VOC, CO, and PM<sub>10</sub> emissions are minimized with the use of a compression-ignited engine that is EPA certified as specified in 40 CFR Part 89, which identifies Tier 1 thru Tier 3 emission levels, or the Federal Register, Vol. 69, No. 124, June 29, 2004, which identifies Tier 4 emission levels.

#### VII. GENERAL CALCULATIONS

##### A. Assumptions

- All calculations and physical constants used are corrected to Standard Conditions as defined in District Rule 1020, Section 3.47 (60 °F and 14.7 lb/in<sup>2</sup>).

---

<sup>1</sup> From *Non-catalytic NO<sub>x</sub> Control of Stationary Diesel Engines*, by Don Koeberlein, CARB.

- Facility utilizes very low sulfur (0.0015% fuel S by weight) diesel fuel and will continue use very low sulfur diesel. Therefore, both the PE1 and PE2 will be based on the use of very low sulfur diesel.
- Density of diesel fuel: 7.1 lb/gal
- EPA F-factor (adjusted to 60°F): 9,051 dscf/MMBtu
- Diesel fuel heating value: 137,000 Btu/gal
- BHP to Btu/hr conversion: 2,542.5 Btu/hp-hr
- Thermal efficiency of engine: commonly  $\approx$  35%
- Operating schedule of existing engines was not limited on the PTOs. Therefore, the pre-project operating schedule of the existing engines will be assumed at a conservative 8,760 hr/year. As such, the post project annual hours will not be limited.

OR

- The pre- and post project operating schedule of the existing engines will be based on the hour limits from their respective PTO(s).

OR

- Another proposal... (per the applicant).
- The emission calculations and the annual load factor (use 80%) will be based on FYI 275 (*Use of Horsepower and Load Factor for IC Engines*)
- For Pre-Project Stationary Source Potential to Emit (SSPE1) and Post Project Stationary Source Potential to Emit (SSPE2) purposes, the existing irrigation pump IC engines at this facility that are not being replaced or modified as a result of this project, the District will assume they operate at an annual average load of 80%, corrected from the 65% load utilized within District "Initial Farm" projects.

## B. Emission Factors

### 1. Pre-Project Emission Factors (EF1)

#### Existing Engines

*(As is the case for all emission factor estimates, use best available data. If the actual EFs from the manufacturer are available or reasonably attainable, use them. If not, utilize the applicable EFs from the latest Carl Moyer Program table (attached to this document). The Carl Moyer EFs speciate NO<sub>x</sub>, VOC, and PM<sub>10</sub> based on*

*the engine model year. If the model year is not known, assume the EFs as shown in the table below.)*

<b>EF1 (Existing Engines)</b>		
<b>Pollutant</b>	<b>g/bhp-hr</b>	<b>Source</b>
NO <sub>x</sub>	10.23	Carl Moyer Program
SO <sub>x</sub>	0.0051	Ultra-Low Sulfur Fuel*
PM <sub>10</sub>	0.4	Carl Moyer Program
CO	3.04	AP-42 Table 3.3-1, 10/96
VOC	1.13	Carl Moyer Program

*\*This EF is based on the use of ultra-low sulfur diesel fuel with 0.0015% sulfur by weight, as shown in the equation below.*

$$EF = 0.0015\% \times 7.1 \text{ lb-fuel/gal} \times 2 \text{ lb-SO}_2/\text{lb-S} \times 1 \text{ gal-fuel}/137,000 \text{ Btu} \times 1 \text{ hp input}/0.35 \text{ hp output} \times 2,542.5 \text{ Btu}/\text{hp-hr} \times 453.6 \text{ lb}$$

$$EF = 0.0051 \text{ g-SO}_x/\text{bhp-hr}$$

New engines

Since these are new emissions units, EF1 = 0 for all pollutants.

**2. Post Project Emission Factors (EF2)**

Existing engines:

Since these units will be cancelled upon implementation of the new units, EF2 = 0 for all pollutants.

New engines:

*(As is the case for all emission factor estimates, use best available data. Since the engines are new, the EFs from the manufacturer or the CARB Executive Order should be attainable.)*

*The SO<sub>x</sub> EF shall be based on the use of ultra-low sulfur diesel-fuel (0.0015% S by weight).*

EF2 for New Engines		
Pollutant	EF2 (g/bhp-hr)	Source
NO <sub>x</sub>		Mfr or Tier X Level*
SO <sub>x</sub>	0.0051	Ultra-Low Sulfur Fuel
PM <sub>10</sub>		Mfr or Tier X Level
CO		Mfr or Tier X Level
VOC		Mfr or Tier X Level*

\*The Carl Moyer program assumes the combined NO<sub>x</sub> + VOC emission factor is split 95% NO<sub>x</sub> and 5% VOC.

### C. Calculations

#### 1. Pre-Project Potential to Emit (PE1)

##### Existing engines

The engine's potential emissions are based on the following equations:

$$PE1_{\text{daily}} = \text{Continuous Rating (bhp)} \times EF1 \text{ (g/bhp-hr)} \times 24 \text{ hr/day} \times \text{lb}/453.6 \text{ g}$$

$$PE1_{\text{annual}} = \text{Continuous Rating (bhp)} \times 0.8 \text{ load} \times EF1 \text{ (g/bhp-hr)} \\ \times 8,760 \text{ hr/year} \times \text{lb}/453.6 \text{ g}$$

Daily PE1 for [insert PTO # for Each Existing Engine to be Replaced]									
Pollutant	(g/bhp-hr)		bhp		hr/day		g/lb		lb/day
NO <sub>x</sub>	6.5	×	300	×	24	÷	453.6	=	103.2
SO <sub>x</sub>	0.0051	×		×		÷		=	0.1
PM <sub>10</sub>	0.4	×		×		÷		=	6.3
CO	8.5	×		×		÷		=	134.9
VOC	0.4	×		×		÷		=	6.3

Annual PE1 for [insert PTOs # for Each Existing Engine to be Replaced]											
Pollutant	(g/bhp-hr)		bhp		load factor		hr/yr		g/lb	lb/yr	
NO <sub>x</sub>	6.5	×	220	×	0.8	×	8,760	÷	453.6	=	22,093
SO <sub>x</sub>	0.0051	×		×		÷		=		17	
PM <sub>10</sub>	0.4	×		×		÷		=		1,360	
CO	8.5	×		×		÷		=		28,891	
VOC	0.4	×		×		÷		=		1,360	

##### New engines

For new emissions units, PE1 = 0 for all pollutants.

## 2. Post Project Potential to Emit (PE2)

### Existing engines:

Since this engine will be replaced upon implementation of the new engine, PE2 = 0 for all pollutants.

### New engines:

The engine's potential emissions are based on the following equations:

$$PE2_{\text{daily}} = \text{Continuous Rating (bhp)} \times EF2 \text{ (g/bhp-hr)} \times 24 \text{ hr/day} \times \text{lb}/453.6 \text{ g}$$

$$PE2_{\text{annual}} = \text{Continuous Rating (bhp)} \times 0.8 \text{ load} \times EF2 \text{ (g/bhp-hr)} \\ \times 8,760 \text{ hr/year} \times \text{lb}/453.6 \text{ g}$$

Daily PE2 for [insert ATC # for Each New Engine]										
Pollutant	(g/bhp-hr)		bhp		hr/day		g/lb		lb/day	
NO <sub>x</sub>	4.5	×	200	×	24	÷	453.6	=	47.6	
SO <sub>x</sub>	0.0051	×		×		÷		=	0.1	
PM <sub>10</sub>	0.15	×		×		÷		=	1.6	
CO	2.6	×		×		÷		=	27.5	
VOC	0.4	×		×		÷		=	4.2	

Annual PE2 [insert ATC # for Each New Engine]											
Pollutant	(g/bhp-hr)		bhp		load factor		hr/yr		g/lb	lb/yr	
NO <sub>x</sub>	4.5	×	200	×	0.8	×	8,760	÷	453.6	=	13,905
SO <sub>x</sub>	0.0051	×		×		×		=		16	
PM <sub>10</sub>	0.15	×		×		×		=		463	
CO	2.6	×		×		×		=		8,034	
VOC	0.4	×		×		×		=		1,236	

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

Pursuant to Section 4.9 of District Rule 2201, the Pre-Project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

The SSPE1 is referenced from project X-XXXXXXX.

Or

The Facility's SSPE1 calculations are attached as **Appendix X**.

<b>SSPE1 (lb/year)</b>					
<b>Permit Unit</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>CO</b>	<b>VOC</b>
<b>Totals</b>					

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

Pursuant to Section 4.10 of District Rule 2201, the Post Project Stationary Source Potential to Emit (SSPE2) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

<b>SSPE2 (lb/year)</b>					
<b>Permit Unit</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>CO</b>	<b>VOC</b>
<b>Totals</b>					

**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

<b>Major Source Determination (lb/year)</b>					
	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC
SSPE2					
PE Transportable Engines*					
<b>SSPE2 Major Source</b>					
<b>Major Source Threshold</b>	<b>20,000</b>	<b>140,000</b>	<b>140,000</b>	<b>200,000</b>	<b>20,000</b>
<b>Major Source?</b>	No	No	No	No	No

\*Per the CAA, Section 302(z), a major stationary source does not include “those emissions resulting directly from an internal combustion engine for transportation purposes or from a nonroad engine...” Therefore, the emissions from the nonroad (also called transportable) engines have been subtracted from the Major Source determination.

As seen in the table above, the facility is not a Major Source for any pollutant.

**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)**

The BE calculation (in lb/year) is performed on a pollutant-by-pollutant basis to determine the amount of offsets required, where necessary. However, Non-Major agricultural operations are exempt from offsets per Rule 2201, Section 4.6.9 (see offsets discussion in Section VIII below). Therefore, BE calculations are not required.

**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**

District Rule 2201, Section 3.18 states that Federal Major Modifications are the same as “Major Modification” as defined in 40 CFR 51.165 and part D of Title I of the CAA.

Since this facility is not a Major Source for any pollutants, this project does not constitute a Federal Major Modification. Additionally, since the facility is not a major source for PM<sub>10</sub> (140,000 lb/year), it is not a major source for PM<sub>2.5</sub> (200,000 lb/year).

#### **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 the appendices.

### **VIII.COMPLIANCE**

#### **Rule 2010 Permits Required**

This rule requires any person building, altering, or replacing any operation, article, machine, equipment, or other contrivance, the use of which may cause the issuance of air contaminants, to first obtain authorization from the District in the form of an ATC. By the submission of the above-described ATC application, the applicant is complying with the requirements of this Rule.

#### **Rule 2020 Exemptions**

Per Section 6.20, agricultural sources are exempt from District permit requirements to the extent provided by CH&SC, section 42301.16. However this facility does not qualify for permit exemption since the NO<sub>x</sub> and/or VOC emissions are greater than 10,000 lb/year (equivalent to ½ the Major Source Threshold).

#### **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\*:

- 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 a Major Modification.

\*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.

**a. New emissions units – PE > 2 lb/day**

As seen in Section VII.C.2 of this evaluation, the applicant is proposing to install a new diesel-fired IC engine with a PE greater than 2 lb/day for **NO<sub>x</sub>, PM<sub>10</sub>, CO, and VOC**. BACT is triggered for **NO<sub>x</sub>, PM<sub>10</sub>, and VOC** since the PEs are greater than 2 lbs/day. BACT is also **(or is not)** triggered for CO since the SSPE2 for CO is greater **(or is less)** than 200,000 lbs/year, as demonstrated in Section VII.C.5 of this document.

**b. Relocation of emissions units – PE > 2 lb/day**

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore BACT is not triggered.

**c. Modification of emissions units – AIPE > 2 lb/day**

As discussed in Section I above, there are no modified emissions units associated with this project; therefore BACT is not triggered.

**d. Major Modification**

As discussed in Section VII.C.7 above, this project does not constitute a Major Modification; therefore, BACT is not triggered as a result of a Major Modification.

**2. BACT Guideline**

The BACT Guideline attached in **Appendix D**, applies to new stationary AO diesel-fired IC engines greater than 50 bhp.

**3. Top-Down BACT Analysis**

Per Permit Services Policies and Procedures for BACT, 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.

Pursuant to the attached Top-Down BACT Analyses (see **Appendix D**), BACT has been satisfied with the following:

**NO<sub>x</sub>:** Latest available tier certification  
**PM<sub>10</sub>:** Latest available tier certification  
**CO:** Latest available tier certification

VOC: Latest available tier certification

## B. Offsets

Per Section 4.6.9, offsets are not required for non-major agricultural operations .

## C. Public Notification

### 1. Applicability

Public noticing is required for:

- a. Any new Major Source, which is a new facility that is also a Major Source,
- b. Major Modifications,
- c. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
- d. Any project which results in the offset thresholds being surpassed, and/or
- e. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.

#### **a. New Major Source**

Since there is not an increase in emissions, this facility is not becoming a Major Source as a result of this project; public noticing is not required for this project for New Major Source purposes.

#### **b. Major Modification**

As demonstrated in Section VII.C.7 above, this project does not qualify as a Major Modification; public noticing is not required for Major Modification purposes.

#### **c. PE > 100 lb/day**

*(For a project including a new emissions unit – PE ≤ 100 lb/day.)*

Applications which include a new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. As seen in Section VII.C.2 above, this project does not include a new emissions unit which has daily emissions greater than 100 lb/day for any pollutant, therefore public noticing for PE > 100 lb/day purposes is not required.

*(For a project including a new emissions unit – PE > 100 lb/day.)*

The PE<sub>2</sub> for this new unit is compared to the daily PE Public Notice thresholds in the following table:

<b>PE &gt; 100 lb/day Public Notice Thresholds</b>			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO <sub>x</sub>	xxx.x	100 lb/day	Yes
SO <sub>x</sub>	xx.x	100 lb/day	No
PM <sub>10</sub>	xx.x	100 lb/day	No
CO	xx.x	100 lb/day	No
VOC	xx.x	100 lb/day	No

Therefore, public noticing for PE > 100 lb/day purposes is required.

**d. Offset Threshold**

Since there is not an increase in emissions as a result of this project, an offset threshold cannot be surpassed; therefore, public notice is not triggered due to offset thresholds.

**e. SSIPE > 20,000 lb/year**

An SSIPE exceeding 20,000 pounds per year for any one pollutant triggers public notice, where SSIPE = SSPE2 - SSPE1.

Since there is not an increase in emissions as a result of this project, the SSIPE is zero; therefore, public notice is not triggered due to offset thresholds.

**2. Public Notice Action**

*(For a project not requiring public notification.)*

As discussed above, this project will not result in emissions, for any criteria pollutant, which would subject the project to any of the noticing requirements listed above. Therefore, public notice will not be required for this project.

*(For a project requiring public notification – PE > 100 lb/day.)*

As discussed above, public noticing is required for this project for NO<sub>x</sub> emissions in excess of 100 lb/day. 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 Emission Limits (DELs)**

Daily Emissions Limitations (DELs) and other enforceable conditions are required by Section 3.15 to restrict a unit’s maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. Per Sections 3.15.1 and 3.15.2, 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. The following conditions will appear on the permit:

- Emissions from this unit shall not exceed any of the following limits: 2.85 g-NO<sub>x</sub>/bhp-hr, 0.15 g-VOC/bhp-hr, or 0.45 g-CO/bhp-hr. [District Rules 2201 and 4702, and 17 CCR 93115]
- PM<sub>10</sub> emissions shall not exceed 0.12 g/bhp-hr based on US EPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102, and 17 CCR 93115]
- Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight is to be used. [District Rules 2201, 4702, and 4801, and 17 CCR 93115]

## **E. Compliance Assurance**

### **1. Source Testing**

Pursuant to District Policy APR 1705, source testing is not required to demonstrate compliance with Rule 2201.

### **2. Monitoring**

No monitoring is required to demonstrate compliance with Rule 2201. However, monitoring is required per Rule 4702 (Internal Combustion Engines - Phase 2), see the 4702 discussion below.

### **3. Recordkeeping**

The following conditions will appear on the permit:

- The permittee shall record the total time the engine operates, in hours per calendar year. [District Rule 2201]
- 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]

### **4. Reporting**

No reporting is required to demonstrate compliance with Rule 2201.

## **F. Ambient Air Quality Analysis (AAQA)**

*(Note: Applicable only when public notice is triggered, otherwise delete this section.)  
(Note: If there is an exceedance of the Ambient Air Quality Standards, this project no longer qualifies as a GEAR. Talk to a supervisor.)*

An AAQA is conducted by the Technical Services group for any project with an increase in emissions and triggers public notice. Discuss the AAQA results as follows:

*For example:*

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 X** of this document for the AAQA summary sheet.

The proposed location is in an attainment area for NO<sub>x</sub>, CO, and SO<sub>x</sub>. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for NO<sub>x</sub>, CO, or SO<sub>x</sub>.

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

*(Note: Special permit conditions may be required as a result of the AAQA.)*

**Rule 2520 Federally Mandated Operating Permits**

As discussed in Section VII.C.5 above, this facility is not a Major Source for any pollutant; therefore, Rule 2520 does not apply.

**Rule 4001 New Source Performance Standards (NSPS)**

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR); and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60.

The requirements of 40 CFR Part 60, Subpart IIII (*Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*) covers stationary engines at agricultural and non-agricultural facilities.

The District has not been delegated the authority to implement this NSPS regulation; therefore, no requirements shall be included on the permit(s).

**Rule 4002 National Emission Standards for Hazardous Air Pollutants (NESHAPs)**

This rule incorporates NESHAPs from Part 61, Chapter I, Subchapter C, Title 40, CFR and the NESHAPs from Part 63, Chapter I, Subchapter C, Title 40, CFR; and applies to all sources of hazardous air pollution listed in 40 CFR Part 61 or 40 CFR Part 63.

The requirements of 40 CFR Part 63, Subpart ZZZZ (*National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*) covers stationary engines at agricultural and non-agricultural facilities.

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(s).

**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 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. Section 4.0 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, compliance with this rule is expected. Therefore, the following condition will be listed on the ATC 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. Therefore pursuant to the policy, a risk management review has been performed for this project to analyze the impact of toxic emissions

The HRA results for each new engine proposed for this project are shown below (see the HRA Summary in [Appendix A](#)):

HRA Results (ATCs #'s)			
Acute Hazard Index	Chronic Hazard Index	Cancer Risk	T-BACT Required for each engine?
Negligible	Negligible	xx in a million	Yes/No

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). The project is approvable since there is a reduction in risk from the facility. There is not an increase in emissions as a result of this project; therefore, the risk from this project is less than significant.

## Discussion of T-BACT

*(For a project where TBACT is triggered):*

BACT for toxic emission control (T-BACT) is required on an emissions unit by emissions unit basis if the cancer risk exceeds one in one million (District thresholds for triggering T-BACT). As demonstrated above, T-BACT is required for each engine since the HRA indicates that the cancer risk for each engine exceeds one in one million.

T-BACT is satisfied with BACT for PM<sub>10</sub> (see [Appendix A](#)), which is the latest available certified engine. The applicant has proposed the latest available certified engines (Tier 3); therefore, compliance with the District's Risk Management Policy is expected.

*(For a project where TBACT is not triggered):*

BACT for toxic emission control (TBACT) is required if the cancer risk exceeds one in one million. As demonstrated above, T-BACT is not required because the HRA indicates that the risk from each unit is not above the District's thresholds for triggering T-BACT requirements (1 in a million); therefore, compliance with the District's Risk Management Policy is expected.

## **Rule 4201 Particulate Matter Concentration**

Particulate matter emissions from the engine will be less than or equal to the rule limit of 0.1 grain per cubic foot of gas at dry standard conditions as shown by the following:

$$\text{PM Conc.} = 0.13 \text{ g-PM}_{10}/\text{bhp-hr} \times 1 \text{ g-PM}/0.96 \text{ g-PM}_{10} \times 1 \text{ bhp-hr}/2,542.5 \text{ Btu} \\ \times 1,000,000 \text{ Btu}/9,051 \text{ dscf} \times 0.35 \text{ Btu}_{\text{out}}/1 \text{ Btu}_{\text{in}} \times 15.43 \text{ gr/g}$$

$$\text{PM Conc.} = 0.03 \text{ gr-PM}/\text{dscf}$$

Since 0.03 grain-PM/dscf is  $\leq$  to 0.1 grain per dscf, compliance with Rule 4201 is expected.

Therefore, the following condition will be listed on the ATCs to ensure compliance:

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

## **Rule 4202 Particulate Matter - Emission Rate**

This rule establishes PM emission limits as a function of process weight rate in tons/hr. Gas and liquid fuels are excluded from the definition of process weight. Therefore, Rule 4202 does not apply to the IC engine(s).

## **Rule 4301 Fuel Burning Equipment**

Pursuant to section 2.0, the provisions of this rule apply to any piece of fuel burning equipment. Section 3.1 defines fuel burning equipment as "any furnace, boiler, apparatus,

stack, and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer”.

IC engines produce power mechanically, not by indirect heat transfer. Therefore, the IC engine(s) do not meet the definition of fuel burning equipment. Therefore, Rule 4301 does not apply.

### **Rule 4701 Internal Combustion Engines - Phase 1**

The provisions of this rule do not apply to engines in agricultural operations in the growing of crops or raising of fowl or animals. Therefore, the following condition will be included on the permit(s):

- This IC engine shall only be used for the growing of crops or raising of fowl or animals.

### **Rule 4702 Stationary Internal Combustion Engines**

#### Purpose (Section 1.0):

The purpose of this rule is to limit the emissions of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and volatile organic compounds (VOC), and sulfur oxides (SO<sub>x</sub>) from internal combustion engines.

#### Applicability (Section 2.0):

This rule applies to any internal combustion engine with a rated brake horsepower greater than 50 horsepower.

#### Requirements (Section 5.0):

Section 5.2 requires that the owner of an internal combustion engine shall not operate it in such a manner that results in emissions exceeding the limits in the Engine Emission Limits Table 4 below.

Engine Type	Emission Limit/ Standard	Compliance Date
<b>1. Non-Certified Compression-Ignited Engine</b>		
a. Greater than 50 bhp but not more than 500 bhp	EPA Tier 3 or Tier 4	1/1/2010
b. Greater than 500 bhp but not more than 750 bhp and less than 1000 annual operating hours	EPA Tier 3	1/1/2010
c. Greater than 750 bhp and less than 1000 annual operating hours	EPA Tier 4	7/1/2011
d. Greater than 500 bhp and greater than or equal to 1000 annual operating hours	80 ppm NOx, 2,000 ppm CO, 750 ppm VOC	1/1/2008 or, if owner has an agreement to electrify, comply by 1/1/2010
<b>2. Certified Compression-Ignited Engine</b>		
a. EPA Certified Tier 1 or Tier 2 Engine	EPA Tier 4	1/1/2015 or 12 years after installation date, but not later than 6/1/18
b. EPA Certified Tier 3 or Tier 4 Engine	Meet Certified Compression-Ignited Engine Standard in effect at time of installation	At time of installation

Per Section 5.2.4.4, the owner/operator of an AO compression-ignited engine that is subject to the requirements of Table 4 shall not replace such engine with a compression-ignited engine, respectively, that emits more emissions of NOx, VOC, and CO, on a ppmv basis, (corrected to 15% oxygen on a dry basis) than the engine being replaced.

Explain how the engine meets the table above; customize the following language for your project if need be:

The proposed engine is of the latest available tier for the particular horsepower range; therefore, meets the requirements of Table 4, Row 2b above. The engine is in compliance with the emission requirements of the rule for the life of the engine.

Monitoring (Section 5.9):

Section 5.9.1 requires that the owner of an AO compression-ignited engine comply with the requirements specified in Sections 5.9.2 through 5.9.5.

Section 5.9.2 requires the owner to properly operate and maintain each engine as recommended by the engine manufacturer or emission control system supplier.

Section 5.9.3 requires the owner to monitor the operational characteristics of each engine as recommended by the engine manufacturer or emission control system supplier.

Section 5.9.4 requires each engine to 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 Stationary 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.

Section 5.9.5 is applicable to engines retrofitted with a NOx exhaust control. The engines in this project do not have add-on NOx controls. Therefore, the requirements of Section 5.9.5 are not applicable.

#### Emission Control Plan (Section 6.1):

Section 6.1 requires that the owner of an engine subject to the requirements of Section 5.1 or Section 8.0, except for an engine specified in Section 6.1.1, shall submit to the APCO an emission control plan (ECP) of all actions to be taken to satisfy the emission requirements of Section 5.1 and the compliance schedules of Section 7.0.

Section 6.1.1 states Sections 6.1.2 through Section 6.1.3 shall not apply to an engine specified below:

6.1.1.1 A certified compression-ignited engine that has not been retrofitted with an exhaust control and is not subject to the requirements of Section 8.0.

The engines in this project are certified compression-ignited engines not retrofitted with exhaust control and are not subject to Section 8.0. Therefore, an ECP is not required.

#### Recordkeeping (Section 6.2):

Section 6.2 requires that except for engines subject to Section 4.0, the owner of an engine subject to the requirements of Section 5.1 shall maintain an engine operating log to demonstrate compliance with this rule. This information 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 engine-operating log shall include, on a monthly basis, the following information:

- Total hours of operation,
- Type of fuel used,
- Maintenance or modifications performed,
- Monitoring data,
- Compliance source test results, and
- Any other information necessary to demonstrate compliance with this rule.

Section 6.2.2 requires that the data collected pursuant to the requirements of Section 5.7 shall be maintained for at least five years, shall be readily available, and made available to the APCO upon request.

Compliance Testing (Section 6.3):

Section 6.3 requires that the owner of an engine subject to the requirements of Section 5.1 or the requirements of Section 8.0, shall comply with the requirements of Section 6.3, except for an engine specified in Section 6.3.1.

Section 6.3.1 states Sections 6.3.2 through Section 6.3.4 shall not apply to an engine specified below:

6.3.1.1 A certified compression-ignited engine that has not been retrofitted with an exhaust control and is not subject to the requirements of Section 8.0.

The engines in this project are certified compression-ignited engines not retrofitted with exhaust control and are not subject to Section 8.0. Therefore, source testing is not applicable.

Inspection and Monitoring (I&M) Plan (Section 6.5):

Section 6.5 requires that the owner of an engine subject to the requirements of Section 5.1 or the requirements of Section 8.0, except for an engine specified in Section 6.5.1, shall submit to the APCO for approval, an I&M plan that specified all actions to be taken to satisfy the requirements of Section 6.5 and 5.7.

Section 6.5.1 states Sections 6.5.2 through Section 6.5.9 shall not apply to an engine specified below:

6.5.1.1 A certified compression-ignited engine that has not been retrofitted with an exhaust control and is not subject to the requirements of Section 8.0.

The engines in this project are certified compression-ignited engines not retrofitted with exhaust control and are not subject to Section 8.0. Therefore, an I&M Plan is not applicable.

**Rule 4801 Sulfur Compounds**

This rule contains a limit on sulfur compounds. The limit at the point of discharge is 0.2 percent by volume, 2000 ppmv, calculated as sulfur dioxide (SO<sub>2</sub>), on a dry basis averaged over 15 consecutive minutes.

The maximum sulfur content of the diesel combusted shall not exceed 0.0015% by weight. Therefore, the sulfur concentration is:

$$\text{S Conc.} = 0.0015\% \text{ S} \times 7.1 \text{ lb/gal} \times 64 \text{ lb-SO}_2/32 \text{ lb-S} \times \text{MMBtu}/9,051 \text{ scf} \times \text{gal-fuel}/0.137 \text{ MMBtu} \\ \times \text{lb-mol}/64 \text{ lb-SO}_2 \times 10.73 \text{ psi-ft}^3/\text{lb-mol-}^\circ\text{R} \times 520 \text{ }^\circ\text{R}/14.7 \text{ psi}$$

$$\text{S Conc.} = 1 \text{ ppmv}$$

Since 1 ppmv is  $\leq$  2000 ppmv, this project is expected to comply with Rule 4801. Therefore, the following condition will be listed on the ATC to ensure compliance:

- 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 93116]

**California Code of Regulations (CCR), Title 17 (Public Health), Division 3 (Air Resources), Chapter 1 (Air Resources Board), Subchapter 7.5 (Air Toxic Control Measures), Measure 93115 (Stationary Diesel Engines)**

The engines are considered “new” (installed at the facility after January 1, 2005) for the purposes of the ATCM.

**§ 93115.1 Purpose**

The purpose of this airborne toxic control measure (ATCM) is to reduce diesel particulate matter (PM) and criteria pollutant emissions from stationary diesel-fueled compression ignition (CI) engines.

**§ 93115.2 Applicability**

(a) Except as provided in section 93115.3, this ATCM applies to any person who either sells a stationary CI engine, offers a stationary CI engine for sale, leases a stationary CI engine, or purchases a stationary CI engine for use in California, unless such engine is:

- (1) a portable CI engine,
- (2) a CI engine used to provide motive power,
- (3) an auxiliary CI engine used on a marine vessel, or
- (4) an agricultural wind machine as defined in section 93115.4.

(b) Except as provided in sections 93115.3 and 93115.9, this ATCM applies to any person who owns or operates a stationary CI engine in California with a rated brake horsepower greater than 50 (>50 bhp).

This regulation is applicable to agricultural irrigation pump engines.

**§ 93115.3 Exemptions**

(b) The requirements specified in sections 93115.6 (emergency engines), 93115.7 (prime engines), and 93115.10(a) (reporting) do not apply to stationary diesel-fueled CI engines used in agricultural operations.

**§ 93115.5 Fuel and Fuel Additive Requirements for New and In-Use Engines**

This regulation stipulates that diesel-fueled portable engines shall use one of the following fuels:

- CARB Diesel Fuel; or
- Alternative diesel fuel that has been verified through the Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines; or
- CARB diesel fuel utilizing fuel additives that have been verified through the Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines.

CARB Diesel fuel will be utilized in the engine(s); therefore, this section is satisfied.

### § 93115.8 Emission Standards Agricultural Operations

Emission Standards for New Stationary Diesel-Fueled CI Engines (>50 bhp) Used in Agricultural Operations:

#### **PM Standards**

As of January 1, 2005, no person shall operate any new stationary diesel-fueled engine to be used in agricultural operations that has a rated brake horsepower greater than 50, **unless the engine meets the applicable PM requirement for the particular power rating and engine acquisition date or application submittal date (summarized in the table below):**

<b>Emission Standards for New Ag Engines (ATCM Section 93115.8, Table 6)</b>	
Horsepower Range (bhp)	Diesel PM Standards (g-PM/bhp-hr)
Greater than 50 but less than 100	0.3 or Off-Road CI Certification Standard, whichever is more stringent
Greater than or equal to 100 but less than 175	0.22 or Off-Road CI Certification Standard, whichever is more stringent
Greater than or equal to 175	0.15 or Off-Road CI Certification Standard, whichever is more stringent

The proposed PM EF for the engine is 0.XX g-PM10/bhp-hr and therefore satisfies the PM requirement above.

#### **NMHC, NOx, and CO Standards:**

Off-Road CI Engine Certification Standard for an off-road engine of the model year and maximum rated power of the engine installed. The proposed engine is Tier X certified; therefore, meets the standards for NMHC, NOx, and CO.

### § 93115.10 Recordkeeping, Reporting, and Monitoring Requirements

(a) Reporting - agricultural engines are exempt from 93115.10(a).

(d) Monitoring Equipment

(1) 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 ATC(s):

- 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]

**California Code of Regulations (CCR), Title 17 (Public Health), Division 3 (Air Resources), Chapter 1 (Air Resources Board), Subchapter 7.5 (Air Toxic Control Measures), Measure 93116 (Portable Diesel Engines)**

This regulation does not apply to stationary engines.

**California Health & Safety Code 42301.6 (School Notice)**

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

**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 are 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**

Compliance with all applicable rules and regulations is expected. Issue ATCs #'s subject to the permit conditions on the attached draft ATCs in **Appendix C**.

**X. Billing Information**

<b>Annual Permit Fees</b>			
Permit Number	Fee Schedule	Fee Description	Annual Fee
<a href="#">ATC #</a>	<a href="#">3020-10-X</a>	<a href="#">XXX</a> bhp IC engine	<a href="#">\$</a>

**Appendices**

- A: HRA Summary
- B: PTO(s) to be Replaced
- C: Draft ATC(s)
- D: BACT/TBACT Analyses
- E: QNEC
- F: Emission Profile(s)

## **APPENDIX A**

*HRA and AAQA Summary*

## **APPENDIX B**

*PTO(s) to be Replaced*

## **APPENDIX C**

*Draft ATC(s)*

## **APPENDIX D**

*BACT Analysis*  
(ATC X-XXXX-X-X)

## San Joaquin Valley Unified Air Pollution Control District

### Best Available Control Technology (BACT) Guideline

**Emission Unit:** Stationary Compression-Ignited AO  
IC Engines

**Industry Type:** Agriculture

**Equipment Rating:** ≤ 1,000 bhp

**Last Update:** June 1, 2006

Pollutant	Achieved in Practice	Technologically Feasible	Alternate Basic Equipment
VOC	<ul style="list-style-type: none"> <li>The proposed engine shall meet the latest available CARB certification standard for the particular horsepower range.</li> </ul> <p>(Example: a 200 bhp engine proposed in 2007 shall emit ≤ 0.149 g-PM10/bhp-hr if triggers BACT for PM10)</p>		<ul style="list-style-type: none"> <li>Electrification</li> <li>NG Fired Engine to meet 4702</li> <li>LPG/Propane Fired Engine to meet 4702</li> </ul>
NO <sub>x</sub>		SCR	
CO			
PM <sub>10</sub>		PM Filter	
SO <sub>x</sub>	<ul style="list-style-type: none"> <li>Very Low Sulfur Fuel (0.0015% fuel S by weight)</li> </ul>		

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. A cost effectiveness analysis is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

\*This is a Summary Page for this Class of Source

3rd Quarter 2006

## Top-Down BACT Analysis for VOC, NO<sub>x</sub>, CO, and PM<sub>10</sub> Emissions

### I. Step 1 - Identify All Possible Control Technologies

Option 1: Latest Available Certified Compression-Ignited Engine, Achieved in Practice (AIP)

Option 2: Natural Gas Fueled Engine, Alternate Basic Equipment (ABE)

Option 3: Propane/Liquid Petroleum Gas (ABE)

Option 4: Electrification (ABE)

Option 5: SCR, Technologically Feasible (TF)

### II. Step 2 - Eliminate Technologically Infeasible Options

There are no technologically infeasible options shown in Step 1.

### III. Step 3 - Rank Technologies

Control Technology	Rank	Emissions	Technology Classification for BACT
Electrification	1	0	ABE
SCR	2	≥ 85% NO <sub>x</sub> reduction (≤ 0.8 g/bhp-hr)	TF
Natural Gas Engine	3	4702 Level for NO <sub>x</sub> (≤ 1.1 g/bhp-hr)	ABE
LPG Engine	4		
Latest Certification	5	Latest Tier Certification Level	AIP

### IV. Step 4 - Cost Effectiveness Analyses

*(Modify discussions of these as necessary):*

#### **Cost Effectiveness Analysis: Electrification**

As demonstrated in the cost analysis below, electrification for any engine 50 – 1,000 bhp is not cost effective. Therefore, electrification is not cost effective for the proposed xxx bhp diesel fired IC engines.

#### **Cost Effectiveness Analysis: Natural Gas Engine**

As demonstrated in the cost analysis below, any NG engine 50 – 1,000 bhp is not cost effective. Therefore, NG engines are not cost effective as ABE for the proposed xxx bhp diesel fired IC engines.

### **Cost Effectiveness Analysis: LPG Engine**

As demonstrated in the cost analysis below, any LPG engine 50 – 600 bhp is not cost effective. Therefore, LPG engines are not cost effective as ABE for the proposed xxx bhp diesel fired IC engines.

### **Cost Effectiveness Analysis: SCR**

As demonstrated in the cost analysis below, a PM filter for any engine 50 – 1,000 bhp is not cost effective. Therefore, PM filters are not cost effective for the proposed xxx bhp diesel fired IC engines.

### **Cost Effectiveness Analysis: Latest Available Certified Compression-Ignited Engine**

Per District BACT Policy, a cost effectiveness analysis is not required for AIP controls since the control must be implemented.

## **V. Step 5 - Select BACT**

The remaining control not eliminated in Step 4 (latest available certification) is considered AIP BACT for this class and category of source. The applicant has proposed the latest certification; therefore, BACT is satisfied.

## BACT Analysis for VOC Emissions

### Step 1 - Identify All Possible Control Technologies

Option 1: Latest Available Certified Compression-Ignited Engine, Achieved in Practice (AIP)

Option 2: Natural Gas Fueled Engine, Alternate Basic Equipment (ABE)

Option 3: Propane/Liquid Petroleum Gas (ABE)

Option 4: Electrification (ABE)

### Step 2 - Eliminate Technologically Infeasible Options

All options from Step 1 are technologically feasible.

### Step 3 - Rank Remaining Control Technologies

Control Technology	Rank	Emissions	Technology Classification for BACT
Electrification	1	0	ABE
Natural Gas Engine	2	4702 Level for VOC ( $\leq 1.1$ g/bhp-hr)	ABE
LPG Engine	3		
Latest Certification	4	Latest Tier Certification Level	AIP

### Step 4 - Cost Effectiveness Analyses

*(Modify discussion of these as necessary):*

#### **Cost Effectiveness Analysis: Electrification**

As demonstrated in the cost analysis below, electrification for any engine 50 – 600 bhp is not cost effective. Therefore, electrification is not cost effective for the proposed **xxx** bhp diesel fired IC engines.

#### **Cost Effectiveness Analysis: Natural Gas Engine**

As demonstrated in the cost analysis below, any NG engine 50 – 600 bhp is not cost effective. Therefore, NG engines are not cost effective as ABE for the proposed **xxx** bhp diesel fired IC engines.

#### **Cost Effectiveness Analysis: LPG Engine**

As demonstrated in the cost analysis below, any LPG engine 50 – 600 bhp is not cost effective. Therefore, LPG engines are not cost effective as ABE for the proposed xxx bhp diesel fired IC engines.

**Cost Effectiveness Analysis: Latest Available Certified Compression-Ignited Engine**

Per District BACT Policy, a cost effectiveness analysis is not required for AIP controls since the control must be implemented.

**V. Step 5 - Select BACT**

The remaining control not eliminated in Step 4 (latest available certification) is considered AIP BACT for this class and category of source. The applicant has proposed the latest certification (Tier 3); therefore, BACT is satisfied.

## BACT Analysis for CO Emissions

### Step 1 - Identify All Possible Control Technologies

Option 1: Latest Available Certified Compression-Ignited Engine, Achieved in Practice (AIP)

Option 2: Natural Gas Fueled Engine, Alternate Basic Equipment (ABE)

Option 3: Propane/Liquid Petroleum Gas (ABE)

Option 4: Electrification (ABE)

### Step 2 - Eliminate Technologically Infeasible Options

All options from Step 1 are technologically feasible.

### Step 3 - Rank Remaining Control Technologies

Control Technology	Rank	Emissions	Technology Classification for BACT
Electrification	1	0	ABE
Natural Gas Engine	2	4702 levels and 3-way catalyst ( $\leq 3.0$ g/bhp-hr)	ABE
LPG Engine	3		
Latest Certification	4	Latest Tier Certification Level	AIP

### Step 4 - Cost Effectiveness Analyses

*(Modify discussion of these as necessary):*

#### **Cost Effectiveness Analysis: Electrification**

As demonstrated in the cost analysis below, electrification for any engine 50 – 600 bhp is not cost effective. Therefore, electrification is not cost effective for the proposed **xxx** bhp diesel fired IC engines.

#### **Cost Effectiveness Analysis: Natural Gas Engine**

As demonstrated in the cost analysis below, any NG engine 50 – 600 bhp is not cost effective. Therefore, NG engines are not cost effective as ABE for the proposed **xxx** bhp diesel fired IC engines.

#### **Cost Effectiveness Analysis: LPG Engine**

As demonstrated in the cost analysis below, any LPG engine 50 – 600 bhp is not cost effective. Therefore, LPG engines are not cost effective as ABE for the proposed xxx bhp diesel fired IC engines.

**Cost Effectiveness Analysis: Latest Available Certified Compression-Ignited Engine**

Per District BACT Policy, a cost effectiveness analysis is not required for AIP controls since the control must be implemented.

**V. Step 5 - Select BACT**

The remaining control not eliminated in Step 4 (latest available certification) is considered AIP BACT for this class and category of source. The applicant has proposed the latest certification (Tier 3); therefore, BACT is satisfied.

## BACT Analysis for PM<sub>10</sub> Emissions

### Step 1 - Identify All Possible Control Technologies

Option 1: Latest Available Certified Compression-Ignited Engine, Achieved in Practice (AIP)

Option 2: Natural Gas Fueled Engine, Alternate Basic Equipment (ABE)

Option 3: Propane/Liquid Petroleum Gas (ABE)

Option 4: Electrification (ABE)

Option 5: Particulate Matter Filter, Technologically Feasible (TF)

### Step 2 - Eliminate Technologically Infeasible Options

All options from Step 1 are technologically feasible.

### Step 3 - Rank Remaining Control Technologies

Control Technology	Rank	Emissions	Technology Classification for BACT
Electrification	1	0	ABE
PM Filter	2	≥ 85% control (results in ≤ 0.045 g-PM <sub>10</sub> /bhp-hr)	TF
Natural Gas Engine	3	≈ 0.063 g-PM <sub>10</sub> /bhp-hr	ABE
LPG Engine	4		
Latest Certification	5	Latest Tier Certification Level (0.149 to 0.3 g-PM <sub>10</sub> /bhp-hr)	AIP

### Step 4 - Cost Effectiveness Analyses

#### **Cost Effectiveness Analysis: Electrification**

As demonstrated in the cost analysis below, electrification for any engine 50 – 600 bhp is not cost effective. Therefore, electrification is not cost effective for the proposed xxx bhp diesel fired IC engines.

#### **Cost Effectiveness Analysis: Natural Gas Engine**

As demonstrated in the cost analysis below, any NG engine 50 – 600 bhp is not cost effective. Therefore, NG engines are not cost effective as ABE for the proposed xxx bhp diesel fired IC engines.

### **Cost Effectiveness Analysis: LPG Engine**

As demonstrated in the cost analysis below, any LPG engine 50 – 600 bhp is not cost effective. Therefore, LPG engines are not cost effective as ABE for the proposed xxx bhp diesel fired IC engines.

### **Cost Effectiveness Analysis: PM Filter**

As demonstrated in the cost analysis below, a PM filter for any engine 50 – 1,000 bhp is not cost effective. Therefore, PM filters are not cost effective for the proposed xxx bhp diesel fired IC engines.

### **Cost Effectiveness Analysis: Latest Available Certified Compression-Ignited Engine**

Per District BACT Policy, a cost effectiveness analysis is not required for AIP controls since the control must be implemented.

## **V. Step 5 - Select BACT**

The remaining control not eliminated in Step 4 (latest available certification) is considered AIP BACT for this class and category of source. The applicant has proposed the latest certification (Tier 3); therefore, BACT is satisfied.

## BACT Analysis for SO<sub>x</sub> Emissions

### **Step 1 - Identify All Possible Control Technologies**

Option 1: Very Low Sulfur Diesel Fuel (0.0015% fuel sulfur content by weight), Achieved in Practice (AIP)

Option 2: Electrification, Alternate Basic Equipment (ABE)

### **Step 2 - Eliminate Technologically Infeasible Options**

All options from Step 1 are technologically feasible.

### **Step 3 - Rank Remaining Control Technologies**

Control Technology	Rank	Emissions	Technology Classification for BACT
Electrification	1	0	ABE
Very Low S Fuel	2	0.0015% fuel sulfur content by weight	AIP

### **Step 4 - Cost Effectiveness Analyses**

*(Modify discussion of these as necessary):*

#### **Cost Effectiveness Analysis: Electrification**

As demonstrated in the cost analysis below, electrification for any engine 50 – 600 bhp is not cost effective. Therefore, electrification is not cost effective for the proposed xxx bhp diesel fired IC engines.

#### **Cost Effectiveness Analysis: Latest Available Certified Compression-Ignited Engine**

Per District BACT Policy, a cost effectiveness analysis is not required for AIP controls since the control must be implemented.

### **V. Step 5 - Select BACT**

The remaining control not eliminated in Step 4 (latest available certification) is considered AIP BACT for this class and category of source. The applicant has proposed the latest certification (Tier 4); therefore, BACT is satisfied. [Attach cost analyses here](#)

## **APPENDIX E**

*Quarterly Net Emissions Change (QNEC)*

### Quarterly Net Emissions Change (QNEC)

The QNEC is entered into PAS database and subsequently reported to CARB. The QNEC is calculated for each pollutant, for each unit, as the difference between the post-project quarterly potential to emit (PE2) and the quarterly pre-project potential to emit (PE1).

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 = Quarterly PE2 - Quarterly 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 = 0 (since these are new units)

Using the values from Sections VII.C.2 in the evaluation above, the QNEC for each new unit can be summarized as follows:

QNEC (ATCs #)		
Pollutant	PE2 (lb/year)	QNEC (lb/qtr)
NO <sub>x</sub>		
SO <sub>x</sub>		
PM <sub>10</sub>		
CO		
VOC		

## **APPENDIX F**

### *Emission Profiles*

## ATC Conditions

**{Copy from PAS general condition folder and remove any conditions not required}**

1. {4830} Within 90 days after startup of the equipment authorized by this Authority to Construct, Permit to Operate C-XXXX-X shall be surrendered to the District and the associated equipment shall be removed or rendered inoperable. [District Rule 2201]
2. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
3. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
4. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [District Rules 2070 and 2080, and Public Resources Code 21000-21177: California Environmental Quality Act]
5. {4002} This IC engine shall only be used for the growing and harvesting of crops or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution. [District Rules 4701 and 4702, and 17 CCR 93115]
6. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
7. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
8. {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]
9. {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]
10. **If necessary**, {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]
11. {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]
12. **If necessary**, {4036} Operation of this engine shall not exceed X,XXX hours per year. [District Rule 2201]
13. {4832} Emissions from this IC engine shall not exceed any of the following limits: X.XX g-NO<sub>x</sub>/bhp-hr, X.XX g-CO/bhp-hr, or X.XX g-VOC/bhp-hr. [District Rules 2201, 4102, and 4702, and 17 CCR 93115]
14. {4833} Emissions from this IC engine shall not exceed X.XX g-PM<sub>10</sub>/bhp-hr based on USEPA

certification using ISO 8178 test procedure. [District Rules 2201, 4102, and 4702, and 17 CCR 93115]

15. {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]
16. {4037} During periods of operation, 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]
17. {4050} The permittee shall maintain an engine-operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: total hours of operation, type of fuel used, maintenance or modifications performed, monitoring data, and any other information necessary to demonstrate compliance. [District Rule 4702]
18. **If necessary,** {4051} The permittee shall record the total time the engine operates, in hours per calendar year. [District Rule 2201]
19. {3497} 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]