

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT  ENGINEERING & COMPLIANCE	PAGES 17	PAGE 1
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APPLICATION PROCESSING AND CALCULATIONS	PROCESSED BY: Thomas Lee	CHECKED BY

**Permit to Construct**  
**Emergency Internal Combustion Engines**  
**Process 17, System 1**

**COMPANY NAME, MAILING AND LOCATION ADDRESS:**

**Name:** Tesoro Refining & Marketing Company  
SCAQMD ID# 800436  
Facility Type: NOx & SOx RECLAIM (Cycle 1), Title V

**Mailing:** P.O. Box 817  
Wilmington, CA 90748-0817

**Location:** 2101 E. Pacific Coast Highway  
Wilmington, CA 90744

**Contact :** Royann Winchester  
Environmental Specialist  
(310) 522-6125

**EQUIPMENT DESCRIPTION:**

Additions are noted in underlines. Deletions are noted in ~~strikeouts~~.

**Section D of Facility Permit, ID# 800436; Process 17, System 1**

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions And Requirements	Conditions
<b>Process 17: ELECTRIC GENERATION</b>					
<b>System 1: EMERGENCY INTERNAL COMBUSTION ENGINES</b>					
<u>INTERNAL COMBUSTION ENGINE, EMERGENCY FIRE WATER, ENG-80, DIESEL FUEL, JOHN DEERE, 6 CYLINDERS, MODEL 6135HFC48B, SERIAL NO. RG6135L014602, WITH TURBOCHARGER AND AFTERCOOLER, 460 kW (617 BHP)</u> <u>A/N: 520668</u>  <u>WITH CARB-VERIFIED DIESEL PM FILTER,</u>	Dxxx		<u>NOX: PROCESS UNIT; SOX: PROCESS UNIT</u>	<u>NOX: 469 LBS/1000 GAL DIESEL (1) [RULE 2012, 5-6-2005]; PM (9) [RULE 404, 2-7-1986]; SOX: 6.24 LBS/1000 GAL DIESEL (1) [RULE 2011, 5-6-2005]</u> <u>CO: 2.6 GRAM/BHP-HR DIESEL (4) [RULE 1303(a)(1)-BACT, 5-10-1996, RULE 1303(a)(1)-BACT, 12-6-2002]; NOX + ROG: 3 GRAM/BHP-HR DIESEL (4) [RULE 1303(a)(1)-BACT, 5-10-</u>	<u>B61.6, B163.x, C1.xx, D12.13, H23.36, H23.xx, K67.13</u>

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*ENGINEERING & COMPLIANCE*

**APPLICATION PROCESSING AND CALCULATIONS**

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				<u>1996, RULE 1303(a)(1)-BACT, 12-6-2002]; PM10: 0.015 GRAM/BHP-HR (5) [RULE 1470, 3-4-2005]</u>	
<u>INTERNAL COMBUSTION ENGINE, EMERGENCY FIRE WATER, ENG-81, DIESEL FUEL, JOHN DEERE, 6 CYLINDERS, MODEL 6135HFC48B, SERIAL NO. RG6135L018321, WITH TURBOCHARGER AND AFTERCOOLER, 460 kW (617 BHP) A/N: 520669</u>  <u>WITH CARB-VERIFIED DIESEL PM FILTER</u>	<u>Dxxx</u>		<u>NOX: PROCESS UNIT; SOX: PROCESS UNIT</u>	<u>NOX: 469 LBS/1000 GAL DIESEL (1) [RULE 2012, 5-6-2005]; PM (9) [RULE 404, 2-7-1986]; SOX: 6.24 LBS/1000 GAL DIESEL (1) [RULE 2011, 5-6-2005] CO: 2.6 GRAM/BHP-HR DIESEL (4) [RULE 1303(a)(1)-BACT, 5-10-1996, RULE 1303(a)(1)-BACT, 12-6-2002]; NOX + ROG: 3 GRAM/BHP-HR DIESEL (4) [RULE 1303(a)(1)-BACT, 5-10-1996, RULE 1303(a)(1)-BACT, 12-6-2002]; PM10: 0.015 GRAM/BHP-HR (5) [RULE 1470, 3-4-2005]</u>	<u>B61.6, B163.x, C1.xx, D12.13, H23.36, H23.xx, K67.13</u>
<u>INTERNAL COMBUSTION ENGINE, EMERGENCY FIRE WATER, ENG-83, DIESEL FUEL, JOHN DEERE, 6 CYLINDERS, MODEL 6135HFC48B, SERIAL NO. RG6135L018323, WITH TURBOCHARGER AND AFTERCOOLER, 460 kW (617 BHP) A/N: 520670</u>  <u>WITH CARB-VERIFIED DIESEL PM FILTER</u>	<u>Dxxx</u>		<u>NOX: PROCESS UNIT; SOX: PROCESS UNIT</u>	<u>NOX: 469 LBS/1000 GAL DIESEL (1) [RULE 2012, 5-6-2005]; PM (9) [RULE 404, 2-7-1986]; SOX: 6.24 LBS/1000 GAL DIESEL (1) [RULE 2011, 5-6-2005] CO: 2.6 GRAM/BHP-HR DIESEL (4) [RULE 1303(a)(1)-BACT, 5-10-1996, RULE 1303(a)(1)-BACT, 12-6-2002]; NOX + ROG: 3 GRAM/BHP-HR DIESEL (4) [RULE 1303(a)(1)-BACT, 5-10-1996, RULE 1303(a)(1)-BACT, 12-6-2002]; PM10: 0.015 GRAM/BHP-HR (5) [RULE 1470, 3-4-2005]</u>	<u>B61.6, B163.x, C1.xx, D12.13, H23.36, H23.xx, K67.13</u>
<u>INTERNAL COMBUSTION ENGINE, EMERGENCY FIRE, 6 CYLINDERS, DIESEL FUEL, DETROIT DIESEL, MODEL DDFP L6FA, SERIAL NO. 6VF 213457, WITH AFTERCOOLER, TURBOCHARGER, 287 BHP A/N 484513</u>	<u>D1123</u>		<u>NOX: PROCESS UNIT; SOX: PROCESS UNIT</u>	<u>NOX: 469 LBS/1000 GAL DIESEL (1) [RULE 2012, 5-6-2005]; PM: (9) [RULE 404, 2-7-1986]; SOX: 6.24 LBS/1000 GAL DIESEL (1) [RULE 2011, 5-6-2005]</u>	<u>B61.2, C1.17, C1.44, C1.48, D12.2, K67.1</u>
<u>INTERNAL COMBUSTION ENGINE, EMERGENCY FIRE WATER, 6 CYLINDERS, DIESEL FUEL, JOHN DEERE, MODEL 6125HF070, SERIAL NO. RG6125H08, WITH AFTERCOOLER, TURBOCHARGER,</u>	<u>D1659</u>		<u>NOX: PROCESS UNIT; SOX: PROCESS UNIT</u>	<u>CO: 2.6 GRAM/BHP HR DIESEL (4) [RULE 1303(a)(1)-BACT, 5-10-1996, RULE 1303(a)(1)-BACT, 12-6-2002]; NOX: 469 LBS/1000 GAL</u>	<u>B61.6, C1.43, C1.44, C1.45, D12.13, H23.36,</u>

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375 BHP A/N: 484509				<del>DIESEL (1) [RULE 2012, 5-6-2005]; NOX + ROG: 4.9 GRAM/BHP HR          DIESEL (4) [RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002]; PM (9) [RULE 404, 2-7-1986];          PM10: 0.15 GRAM/BHP-HR          DIESEL (4) [RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002]; SOX: 6.24 LBS/1000 GAL          DIESEL (1) [RULE 2011, 5-6-2005]</del>	K67.13
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**CONDITIONS**

B61.2 The operator shall only use diesel fuel containing the following specified compounds:

Compound	weight percent
Sulfur compounds less than	0.05

[**RULE 1303(a)(1)-BACT, 5-10-1996**]

[Devices subject to this condition : D713, D714, D1100, D1101, D1102, D1103, D1104, ~~D1123~~]

B61.6 The operator shall not use diesel fuel containing the following specified compounds :

Compound	ppm by weight
Sulfur <del>less than or equal to</del> greater than	15

[**RULE 1470, 6-1-2007 ; RULE 431.2, 5-4-1990 ; RULE 431.2, 9-15-2000**]

[Devices subject to this condition : D1617, D1618, D1645, D1646, ~~D1659~~, Dxxx, Dxxx, Dxxx]

*Note : 'less than or equal to' was inadvertently used instead of 'greater than'. This error has been corrected and will be reflected when the permit(s) under this evaluation is issued.*

B163.x The operator shall only use this equipment subject to the restrictions containing the following:

This engine shall not be operated unless its exhaust is vented to a CARB verified diesel particulate filter system which 1) has a control efficiency of 85 percent or greater ; 2) is in full operation ; and 3) is in good operating condition at all times.

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The operator shall install and maintain an operational data logging and alarm system for the diesel particulate filter system prior to putting the engine in service. The system shall be programmed to interface with the engine control system to automatically shutdown the engine or switch it to power de-rating mode whenever the backpressure of the diesel particulate filter exceeds the maximum backpressure setting specified by the filter manufacturer.

The operator shall regenerate the diesel particulate filter whenever a warning signal is received from the alarm system indicating the backpressure of the filter has exceeded the maximum backpressure setting specified by the filter manufacturer. To achieve filter regeneration, the operator shall run the engine until the exhaust temperature is at or exceeds the temperature specified by the filter manufacturer and the backpressure monitoring system indicates a normal backpressure reading.

The temperature of the engine exhaust gas at the inlet to the diesel particulate filter system shall be maintained in accordance with the temperature specified by the filter manufacturer.

The operator shall maintain records of :

- A. Particulate filter inspections, replacements and regenerations ;
- B. Data retrieve from the data logging system that include the backpressure, exhaust gas temperature and the date and time of the readings.

The operator shall maintain these records for a minimum of five years and make them available to District personnel upon request.

[RULE 1470, 6-1-2007]

[Devices subject to this condition : Dxxx, Dxxx, Dxxx]

C1.17 The operator shall limit the operating time to no more than 199 hour(s) in any one year.

[RULE 1110.2, 2-1-2008; **RULE 1304(c)-Offset Exemption, 6-14-1996**; RULE 1470, 6-1-2007]

[Devices subject to this condition: D713, D714, D1100, D1101, D1102, D1103, D1104, ~~D1123~~]

C1.43 The operator shall limit the maintenance and testing to no more than 50 hour(s) in any one year.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

[**RULE 1303(a)(1)-BACT, 5-10-1996** ; RULE 1303(a)(1)-BACT, 12-6-2002 ; **RULE 1303(b)(2)-Offset, 5-10-1996** ; RULE 1303(b)(2)-Offset, 12-6-2002 ; RULE 1470, 6-1-2007]

[Devices subject to this condition : D1617, D1618, D1645, D1646, ~~D1659~~]

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C1.44 The operator shall limit the maintenance and testing to no more than 5 hour(s) in any one month.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

[**RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002**]

[Devices subject to this condition: ~~D1123~~, D1617, D1618, D1645, D1646, ~~D1659~~]

C1.45 The operator shall limit the operating time to no more than 199 hour(s) in any one year.

[**RULE 1110.2. 2-1-2008 ; RULE 1303(b)(2)-Offset, 5-10-1996 ; RULE 1303(b)(2)-Offset, 12-6-2002 ; RULE 1470, 6-1-2007**]

[Devices subject to this condition : D1617, D1618, D1645, D1646, ~~D1659~~]

~~C1.48 The operator shall limit the maintenance and testing to no more than 34 hour(s) in any one year.~~

~~The purpose of this condition is to ensure compliance with requirements of National Fire Protection Association (NFPA) 25 standards.~~

~~The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.~~

~~[RULE 1470, 6-1-2007]~~

~~[Devices subject to this condition: ~~D1123~~]~~

C1.xx The operator shall limit the operating time to no more than 200 hour(s) in any one year.

This engine shall not be operated more than 200 hours in any one year, which includes no more than 50 hours in any one year and no more than 4.2 hours in any one month for maintenance and testing.

**[RULE 1304(a)-Modeling and Offset Exemption, 6-14-1996; RULE 1470, 6-1-2007; RULE 2012, 5-6-2005]**

[Devices subject to this condition : Dxxx, Dxxx, Dxxx]

D12.2 The operator shall install and maintain a(n) non-resettable elapsed time meter to accurately indicate the elapsed operating time of the engine.

**[RULE 1304(c)-Offset Exemption, 6-14-1996 ; RULE 2012, 5-6-2005]**

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[Devices subject to this condition : D713, D714, D1100, D1101, D1102, D1103, D1104, ~~D1123~~]

D12.13 The operator shall install and maintain a(n) non-resettable elapsed time meter to accurately indicate the elapsed operating time of the engine.

[RULE 1110.2, 2-1-2008 ; RULE 1470, 6-1-2007 ; **RULE 2012, 5-6-2005**]

[Devices subject to this condition : D1617, D1618, D1645, D1646, ~~D1659~~, Dxxx, Dxxx, Dxxx]

H23.36 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
PM	District Rule	1470

[RULE 1470, 6-1-2007]

[Devices subject to this condition: D1617, D1618, D1645, D1646, ~~D1659~~, Dxxx, Dxxx, Dxxx]

H23.xx This equipment is subject to the applicable requirements of the following rules or regulations :

<u>Contaminant</u>	<u>Rule</u>	<u>Rule/Subpart</u>
<u>CO</u>	<u>40CFR 60, SUBPART</u>	<u>III</u>
<u>PM</u>	<u>40CFR 60, SUBPART</u>	<u>III</u>
<u>Non-Methane Hydrocarbon</u>	<u>40CFR 60, SUBPART</u>	<u>III</u>
<u>NOX</u>	<u>40CFR 60, SUBPART</u>	<u>III</u>

**[40CFR 60 Subpart III, 7-11-2006]**

[Devices subject to this condition : Dxxx, Dxxx, Dxxx]

K67.1 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

The date of operation, the elapsed time in hours, and the reason for operation.

[**RULE 1304(a)-Modeling and Offset Exemption, 6-14-1996; RULE 2012, 5-6-2005**]

[Devices subject to this condition: D713, D714, D1100, D1101, D1102, D1103, D1104, ~~D1123~~]

K67.13 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

An engine operating log shall be maintained which on a monthly basis shall include manual and automatic operation and shall list all engine operations in each of the following areas:

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- A. Emergency use hours of operation
- B. Maintenance and testing hours
- C. Other operating hours (describe the reason for operation)

In addition, each time the engine is ~~started~~ manually started, the log shall include the date of operation, the specific reason for operation and the timer reading in hours and tenths of hours at the beginning and end of operation. The log shall be kept for a minimum of ~~three~~ five calendar years prior to the current year and made available to ~~the~~ District personnel upon request. The total hours of operation and the total hours of operation for maintenance and testing for the previous calendar year shall be recorded sometime during the first 15 days of January of each year.

[RULE 1110.2, 2-1-2008; **RULE 1303(b)(2)-Offset, 5-10-1996**; RULE 1303(b)(2)-Offset, 12-6-2002; RULE 1470, 6-1-2007]

[Devices subject to this condition: D1617, D1618, D1645, D1646, ~~D1659~~, Dxxx, Dxxx, Dxxx]

### **COMPLIANCE RECORD REVIEW**

A three year printout of the facility's compliance history is shown in Attachment 1. All NOV's issued to this facility are listed as either 'closed', 'void' and/or 'in compliance' in the District's CLASS data base except for NOV's P52842 and P58204.

NOV P52842 was issued to Tesoro on 4-27-10 for multiple violations of Rule 1189(c)(3) at the HGU-2 process unit. An emergency hearing was conducted at the AQMD Hearing Board on 4-28-10 and the facility was denied a variance. The unit was shut down from 4-6-10 until 9-10-10. After completing the necessary repairs, Tesoro started the unit up on 9-10-10 to conduct source tests to demonstrate compliance with Rule 1189. Preliminary results by the source testing company, Delta Air Quality Services, demonstrated compliance with Rule 1189 and the HGU-2 has been operating on and off since then. Tesoro submitted the test report to the District on 11-18-10 for review and approval. The disposition of this NOV is currently pending approval of the test results by District STE. The status of this NOV will be changed to 'INCOMP' upon STE approval.

According to District Inspector Chhai Chorn, the issues surrounding NOV P58204 have been resolved but the CLASS system has not been updated to reflect this. Thus, the status will be changed to 'INCOMP'.

### **BACKGROUND**

Tesoro Refining and Marketing Company (Tesoro) plans to install three (3) new identical stationary diesel-fueled emergency firewater internal combustion engines (ICEs), rated at 460 kW (617 BHP) each, at the Los Angeles Refinery. The engines will be used to provide firewater during emergencies and are part of a refinery wide project to upgrade existing firewater distribution system to meet LA City and County Fire Codes. Two existing stationary emergency firewater ICEs, D1123 and D1659, operating under AQMD Permits G2356 and G2357, respectively, will be permanently removed from service and the permits will be surrendered by Tesoro.

The upgrades to the firewater system include the installation of new, high flow (1250 gpm) fire monitors. These monitors require significantly higher header water pressure than what the current system is capable of

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producing. The 3 new ICEs, manufactured by John Deere Power Systems, will service 3 new Clarke firewater pumps that can provide up to 3500 gpm of firewater. One pump will be located in the south area of the refinery and the other two will be in the north area. In the north area, the two firewater pumps (P-3559, P-3560) will take suction from an existing firewater tank, TK-55000. In the south area, the firewater pump (P-3571) will take suction from tank, TK-3809. The new engines are not expected to operate more than 200 hours per year, which include no more than 50 hours per year for maintenance and testing. The John Deere engines to be installed are US EPA and CARB Tier 3 certified engines with an engine model year of 2010.

### APPLICATIONS/FEE SUMMARY

Tesoro has requested expedited processing of the three ICE applications because recent audits have deemed the current firewater distribution system not capable of reliably delivering adequate firewater at the required pressure and flow rates. The following table summarizes the applications/fees submitted by Tesoro:

**Table 1 – AQMD Applications Submitted**

A/N	Equipment	Device ID	Type	Status	Requested Action	Deemed Complete	Fee Schedule	Fee Required	Expedited Fee	Fee Paid
520667	TV Permit Revision	NA	87	21	Revise TV permit	4-12-2011	-	\$1,723.07	\$861.54	\$2,584.61
520668	ICE	Dxxx <sup>1</sup>	10	20	Install new ICE	4-12-2011	B	\$2,094.60	\$1,047.30	\$3,141.90
520669	ICE	Dxxx <sup>1</sup>	10	20	Install new ICE	4-12-2011	B	\$1,047.30 <sup>2</sup>	\$523.65	\$1,570.95
520670	ICE	Dxxx <sup>1</sup>	10	20	Install new ICE	4-12-2011	B	\$1,047.30 <sup>2</sup>	\$523.65	\$1,570.95

<sup>1</sup> To be assigned new ID# in FP.

<sup>2</sup> Identical equipment at 50% of normal fee.

### PROCESS DESCRIPTION

The new ICEs will drive emergency firewater pumps P-3559, P-3560 and P-3571 at the Los Angeles Refinery. These 4-cycle, 6-cylinder engines are driven by diesel fuel that meet the 15 ppm or less sulfur by weight requirement pursuant to Rule 431.2 and Title 13 CCR, Sections 2281 to 2284. They are equipped with turbocharger and after-cooler for enhanced engine performance. The engine information is summarized in Table 2 and detailed engine specifications are contained in A/N 520670 folder for reference:

**Table 2 – New ICE Information & Service**

Emergency Fire Pump	Engine Mfg	Engine Model No.	Serial No.	Rating, BHP/kW	Speed	Fuel Type
P-3559 (ENG-80)	John Deere	6135HFC48B	RG6135L014602	617/460	1760	Diesel
P-3560 (ENG-81)	John Deere	6135HFC48B	RG6135L018321	617/460	1760	Diesel
P-3571 (ENG-83)	John Deere	6135HFC48B	RG6135L018323	617/460	1760	Diesel

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The two existing ICEs that will be removed from service are shown in Table 3:

**Table 3 – Existing ICE to be Removed**

Device ID	Engine Mfg	Engine Model No.	Serial No.	Rating, BHP/kW	Speed	Fuel Type
D1123	Detroit Diesel	DDFP-L6FA	6VF-213457	287/214	2100	Diesel
D1659	John Deere	6125HF070	RG6125H08	375/280	2100	Diesel

## EMISSIONS

Pursuant to Rule 1470 (c)(2)(C)(i), new stationary emergency stand-by diesel-fueled IC engines with permit application or installation dates after January 1, 2011 must comply with diesel PM emission standard under Title 13, CCR, Section 2423, which delineate to Tier 4 interim emission standards (approved in the ARB 2004 ACTM). For new engines servicing emergency standby fire pumps with an engine model year of 2010, the HC, NO<sub>x</sub>, NMHC+NO<sub>x</sub> and CO emissions must comply with Tier 3 standards per Rule 1470 (c)(2)(C)(iv)(II).

The manufacturer's certified emissions data (see Attachment 2) for the new engines to be installed for this project are summarized in Table 4. As shown, the subject engine complies with Tier 3 standards for CO, NO<sub>x</sub> and NMHC but does not comply with the Tier 4 interim emission standard of 0.015 g/bhp-hr (0.02 g/kW-hr) for diesel PM. In order to meet the diesel PM standard of 0.015 g/bhp-hr (0.02 g/kW-hr), the engine(s) must be equipped with a CARB-verified diesel particulate filter (DPF) designed with a minimum control efficiency of 85%.

**Table 4 – Engine Emissions Data**

Pollutant	John Deere 6135HFC48B (460 kW)		Tier 3 Standards (450≤kW≤560)		Interim Tier 4 Standards (130≤kW≤560)	
	g/bhp-hr	g/kW-hr	g/bhp-hr	g/kW-hr	g/bhp-hr	g/kW-hr
CO	0.45	0.6	2.6	3.5	2.6	3.5
PM	0.075	0.10	0.15	0.20	0.015	0.02
NO <sub>x</sub>	2.46	3.3	-	-	0.3	0.4
ROG	0.075	0.10	-	-	0.14	0.19
NO <sub>x</sub> + ROG	2.53	3.4	3.0	4.0	-	-
SO <sub>x</sub> <sup>1</sup>	0.005	0.007	0.005	0.007	0.005	0.007

<sup>1</sup> Based on maximum 15 ppm Sulfur content (Rule 432.1 and Title 13 CCR):

$$\left[ \frac{15 \text{ lb Sulfur}}{1,000,000 \text{ lb Diesel}} \right] \left[ \frac{2 \text{ lb SO}_2}{\text{lb Sulfur}} \right] \left[ \frac{7.1 \text{ lb Diesel}}{\text{gal Diesel}} \right] \left[ \frac{1 \text{ gal Diesel}}{129,500 \text{ BTU}} \right] \left[ \frac{2,546 \text{ BTU}}{\text{bhp-hr}} \right] \left[ \frac{453.6 \text{ gr}}{\text{lb}} \right] \left[ \frac{1 \text{ hp-in}}{0.37 \text{ hp-out}} \right] = \frac{0.005 \text{ gr SO}_x \text{ (as SO}_2\text{)}}{\text{bhp-hr}}$$

For emergency standby diesel IC engines, Rule 1306(b) specifies that emissions shall be calculated using the engine's maximum rated capacity and the maximum monthly hours of operation. The maximum monthly hours of operation will be based on testing and maintenance (T&M) operation of the engine which is limited by BACT Guideline and Rule 1470 (c)(2)(C)(i)(III) to 50 hours per year. The monthly hours of T&M is determined by dividing the annual limit by 12. Consequently, 4.2 hours (50 hours/12 months) is used to determine monthly emissions. The following emissions calculations are based on 4.2 hours/month.

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**Table 5 – Engine Emissions Summary**

	Rated kW	Units	Pollutant				
			SO <sub>x</sub>	NO <sub>x</sub>	ROG	CO	PM
<b>Mfg certified emission factors for John Deere Model No. 6135HFC48B</b>	<b>460 (617 bhp)</b>	<b>g/bhp-hr</b>	<b>0.005</b>	<b>2.46</b>	<b>0.075</b>	<b>0.45</b>	<b>0.075</b>
Uncontrolled Emissions (for each engine)	460 (617 bhp)	lb/hr <sup>1</sup>	0.007	3.34	0.10	0.61	0.10
		lb/day <sub>max daily</sub>	0.007	3.34	0.10	0.61	0.10
		lb/day <sub>avg daily</sub>	0.001	0.47	0.01	0.08	0.01
		lb/yr <sub>annual</sub>	0.35	168.3	5.0	30.7	5.0
Controlled Emissions w/ DPF (for each engine)	460	lb/hr	0.007	3.34	0.10	0.61	0.015 <sup>2</sup>
		lb/day <sub>max daily</sub>	0.007	3.34	0.10	0.61	0.015
		lb/day <sub>avg daily</sub>	0.001	0.47	0.01	0.08	0.002
		lb/yr <sub>annual</sub>	0.35	168.3	5.0	30.7	0.76

<sup>1</sup>Based on maximum operating time of 1 hr/day; 1day/wk; 30 day/mo; 4.33 wk/mo; 4.2 hr/mo; 50 hr/yr; 454 g/lb; 0.7457 kW/bhp.

<sup>2</sup>Using CARB verified diesel particulate filter with control efficiency of 85% minimal:  $[0.10 \text{ lb/hr} \times (1-0.85)] = 0.015 \text{ lb/hr} \rightarrow (0.015 \text{ lb/hr})(454 \text{ gr/lb}) \div (617 \text{ bhp}) = 0.011 \text{ g/bhp-hr}$ , which is < Tier 4 PM standard of 0.015 g/bhp-hr. For the other criteria pollutants, engine meets Tier 3 standards without any add-on control.

As shown in Tables 4 and 5, emissions are less than 0.5 lb/day<sub>avg daily</sub> (30 day avg.) from each engine. Furthermore, the engine(s) complies with the interim Tier 4 standard for diesel PM with the installation of DPF and the Tier 3 standards for CO, NMHC + NO<sub>x</sub> and SO<sub>x</sub>.

As a Cycle 1 NO<sub>x</sub>/SO<sub>x</sub> RECLAIM facility, the emissions impact for NO<sub>x</sub> and SO<sub>x</sub> were also evaluated for this project. The NO<sub>x</sub> and SO<sub>x</sub> emissions for the two engines to be removed from service (D1123 and D1659) were obtained from their respective permit files along with Tesoro's reported RECLAIM emissions (through District's WATERS data base) are contained in Attachment 3 for reference. The expected net RECLAIM emissions impact for this project is summarized in Table 6 below.

**Table 6 – RECLAIM Emissions Impact for Project**

	Units	Device	BHP	SO <sub>x</sub>	NO <sub>x</sub>
Estimated emissions increase from new IC engines (3)	lb/day (lb/yr)	Dxxx, Dxxx, Dxxx	617 ea	0.021 (1.05)	10.0 (505)
Estimated emissions reduction from removal of existing IC engines (2)	lb/day (lb/yr)	D1123	287	-0.10 (-3.4)	-4.36 (-148)
	lb/day (lb/yr)	D1659	375	-0.004 (-0.2)	-3.72 (-186)
Net RECLAIM Emissions from project	lb/day (lb/yr)			-0.083 (-2.55)	+1.92 (+171)

As shown, a net reduction in SO<sub>x</sub> and a small increase in NO<sub>x</sub> annual emissions are anticipated from this entire project. The implications of these RECLAIM pollutants are further discussed under REG XX.

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**EVALUATION:**

**PART 1 SCAQMD REGULATIONS**

<b>Rule 212</b>	<b>Standards for Approving Permits</b>	<b>November 14, 1997</b>
	<p>This project meets all criteria in Rule 212 for permit approval. The ICEs are expected to operate without emitting air contaminants in violation of Division 26 of the State Health &amp; Safety Code or in violation of AQMD rules and regulations. Public notice pursuant to Rule 212 is not required because of the following:</p> <ol style="list-style-type: none"> <li>1. 212(c)(1) – The permit unit is well beyond 1000 feet from the outer boundary of a school as shown in Attachment 4 (aerial view of engine locations to nearest school).</li> <li>2. 212(c)(2) – As shown in Table 5, the daily maximum emissions increase of criteria air pollutants is well below the thresholds specified in 212(g).</li> <li>3. 212(c)(3) – The emergency ICE(s) is exempt from Rule 1401 pursuant to Rule 1401(g)(1)(F).</li> </ol>	
<b>Rule 401</b>	<b>Visible Emissions</b>	<b>November 9, 2001</b>
	<p>Visible emissions are not expected under normal operating conditions. Compliance is expected.</p>	
<b>Rule 402</b>	<b>Nuisance</b>	<b>May 7, 1976</b>
	<p>Odor problems and nuisance complaints are not expected under normal operating conditions. Compliance is expected.</p>	
<b>Rule 404</b>	<b>Particulate Matter - Concentration</b>	<b>February 7, 1986</b>
	<p>The engine exhaust flow rate is 2,809 ft<sup>3</sup>/min at 865°F based on manufacturer's data, which is equivalent to 1,124 ft<sup>3</sup>/min at standard conditions. For this exhaust flow, the maximum concentration of particulate matter allowed is 0.179 grains/dscf per Table 404(a) of Rule 404. Based on the manufacturer's emission factor for PM of 0.075 grams/bhp-hr (without control), the PM emissions for the engine is calculated to be 0.0106 grains/dscf (see below):</p> $\left(\frac{0.075 \text{ gr}}{\text{bhp-hr}}\right) \left(\frac{1 \text{ lb}}{454 \text{ gr}}\right) (617 \text{ bhp}) \left(\frac{\text{min}}{1124 \text{ sf}}\right) \left(\frac{\text{hr}}{60 \text{ min}}\right) \left(\frac{7000 \text{ grains}}{\text{lb}}\right) = 0.0106 \frac{\text{grains}}{\text{dscf}} < 0.179$ <p>With the use of a CARB verified DPF at 85% control efficiency, the controlled PM emissions is expected to be 0.0016 grains/dscf (see below):</p> $\left(\frac{0.011 \text{ gr}}{\text{bhp-hr}}\right) \left(\frac{1 \text{ lb}}{454 \text{ gr}}\right) (617 \text{ bhp}) \left(\frac{\text{min}}{1124 \text{ sf}}\right) \left(\frac{\text{hr}}{60 \text{ min}}\right) \left(\frac{7000 \text{ grains}}{\text{lb}}\right) = 0.0016 \frac{\text{grains}}{\text{dscf}} < 0.179$ <p>Therefore, compliance is expected with or without the use of DPF.</p>	

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<b>Rule 407</b>	<b>Liquid and Gaseous Air Contaminants</b>	<b>April 2, 1982</b>
ICE(s) is exempt from the provisions of this rule per subparagraph (b)(1) of Rule 407.		

<b>Rule 409</b>	<b>Combustion Contaminants</b>	<b>August 7, 1981</b>
ICE(s) is exempt from the provisions of this rule.		

<b>Rule 431.2</b>	<b>Sulfur Content of Liquid Fuels</b>	<b>September 15, 2000</b>
Pursuant to subparagraph (e)(2) of this rule, the facility has indicated the ICE(s) will only be fueled with low sulfur diesel fuel with a sulfur content below 15 ppm by weight. Proposed condition B61.6 stipulates this requirement in the permit. Compliance is expected.		

**Reg IX NSPS**

<b>Subpart III</b>	<b>Standards of Performance for Stationary Compression Ignition Internal Combustion Engines</b>	<b>June 28, 2006</b>		
Pursuant to §60.4205(c), owners and operators of new fire pump engines with a displacement of less than 30 liters per cylinder must comply with emission standards in Table 4 of this Subpart. Based on the certified emissions data provided by the manufacturer, the engine(s) is expected to comply with the emissions standards of this Subpart as indicated below:				
40CFR 60 Subpart III				
Table 4, Emission Standards				
Maximum Engine Power	Model Yr	NMHC+NO <sub>x</sub> gr/kW-hr (gr/bhp-hr)	CO gr/kW-hr (gr/bhp-hr)	PM gr/kW-hr (gr/bhp-hr)
450 ≤ kW ≤ 560 (600 ≤ HP ≤ 750)	2008 and earlier	10.5 (7.8)	3.5 (2.6)	0.54 (0.40)
	2009+	4.0 (3.0)	3.5 (2.6)	0.20 (0.15)
John Deere Engine(s), Model 6135HFC48B				
Engine Power	Model Yr	NMHC+NO <sub>x</sub>	CO	PM
460kW (617HP)	2010	3.4 (2.5)	0.6 (0.45)	0.1 (0.075)

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**Reg X NESHAPs**

<b>Subpart ZZZZ</b>	<b>National Emissions Standards for Hazardous Air Pollutants for Petroleum Stationary Reciprocating Internal Combustion (RICE MACT) Engines</b>	<b>June 26, 2006</b>
	<p>This MACT applies to RICE located at a major source of HAP emissions. This subpart delineates the requirements for stationary RICE, including compression ignition engines, and applicable engines are required to meet either emission limitations or meet other specified subparts.</p> <p>Pursuant to §63.6590(b) of this subpart, new emergency stationary RICE with a site rating of more than 500 BHP located at a major source of HAP emissions is exempt from the requirements of this subpart and of subpart A of this part except for the initial notifications per §63.6645(f). Under this subsection, the owner or operator of an affected source that has an initial startup before the effective date of a relevant standard under this part shall notify the Administrator in writing that the source is subject to the relevant standard. Since the initial startup of the subject engines are after the effective date of the RICE MACT, no notification is required for this exempt emergency fire engine(s).</p>	

**Reg XI**

<b>Rule 1110.2</b>	<b>Emissions from Gaseous- and Liquid- Fueled Engines</b>	<b>July 9, 2010</b>
	<p>Pursuant to subparagraph (h)(2) of Rule 1110.2, the provisions of this rule do not apply to emergency standby engines for fire-fighting, as approved by the District, which operate 200 hours or less per year as determined by an elapsed operating time meter. Proposed conditions C1.xx, D12.13 and K67.13 limits the operation of the engine(s) to 200 hours through the use of a non-resettable elapsed time meter. Therefore, the engine(s) is not subject to requirements of this rule.</p>	

**REG XIII**

<b>REG XIII</b>	<b>New Source Review (NSR)</b>	
	<p>This rule requires the Executive Officer to deny a Permit to Construct for any new, modified or relocated source which results in an emission increase of any nonattainment air contaminant, any ozone depleting compound, or ammonia, unless BACT is used. This rule also requires modeling and offset (among other requirements) if there is a net increase in any nonattainment air contaminants for any new or modified source. The definition of "Source" in Rule 1302(ao) is "any permitted individual unit, piece of equipment, article, machine, process, contrivance, or combination thereof, which may emit or control an air contaminant. This includes any permit unit at any non-RECLAIM facility and any device at a RECLAIM facility.</p> <p>As shown in Table 5 in the Emissions section of this evaluation, no emissions increase (&lt; 0.5 lb/day) of non-RECLAIM pollutants is anticipated from the new engine(s). As such, the engine(s) is not subject to the requirements of NSR.</p>	
<b>1303(a)</b>	<b>BACT</b>	<b>December 6, 2002</b>
	<p>BACT means the most stringent emission limitation or control technique which: (1) has been achieved in practice; or (2) is contained in any State Implementation Plan; or (3) is</p>	

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any other emission limitation or control technique approved by the EO and cost effective as compared to measures listed in the AQMP.

Although the engine(s) is not subject to BACT under Reg XIII, it is subject to Rule 1470 which delineates to interim Tier 4 standard for PM and Tier 3 standards for CO, NO<sub>x</sub> + ROG, and SO<sub>x</sub>, which is BACT.

The subject engine(s) has been certified by EPA and CARB to meet Tier 3 standards. The EPA Certification no. and CARB Executive Order information, along with the manufacturer's emission data for this engine, are contained in Attachment 2 for reference. Below is a brief summary of the USEPA Tier 3 requirements as well as the engine's uncontrolled emissions which demonstrate compliance with 'achieved in practice' BACT for all pollutants except PM.

Table 7

Pollutant	Tier 3 Standards (450 ≤ kW ≤ 560)		John Deere Model No. 6135HFC48B (460 kW)	
	g/bhp-hr	g/kW-hr	g/bhp-hr	g/kW-hr
CO	2.6	3.5	0.45	0.6
PM	0.15	0.20	0.075	0.10
NO <sub>x</sub>	-	-	2.46	3.3
ROG	-	-	0.075	0.10
NO <sub>x</sub> + ROG	3.0	4.0	2.53	3.4
SO <sub>x</sub>	Diesel with <15 ppm S by wt	Diesel with <15 ppm S by wt	Diesel with <15 ppm S by wt	Diesel with <15 ppm S by wt

Note that interim Tier 4 standard for PM (0.015 g/bhp-hr), which is contained in the CARB 2004 ATCM became effective on January 1, 2011, is also a Rule 1470 requirement even though the ACTM was recently amended by CARB to lower the NO<sub>x</sub> and PM limits to Tier 3 levels. Until Rule 1470 is amended to coincide with the amended ACTM, PM control using PDF (with minimal efficiency of 85%), which can be considered achieved in practice BACT, will be required to meet the interim Tier 4 PM limit. Please see discussion under Rule 1470 for more information.

**1303(b)(1),  
1303(b)(2)**

**Modeling  
Offsets**

**December 6, 2002**

This new engine(s) is not subject to the Offset requirements of REG XIII because the emissions increase of non-RECLAIM pollutants is less than 0.5 lb/day for all 3 engines combined. Additionally, pursuant to Rule 1304(a)(4), this engine is exempt from modeling and offsets because it is exclusively used as emergency standby equipment and does not operate more than 200 hours per year as evidenced by an engine hour meter. This restriction on engine operation will be conditioned in the permit under C1.xx and D12.2.

**Reg XIV**

**Rule 1401**

**New Source Review of Toxic Air Contaminants**

**March 4, 2005**

Pursuant to Rule 1401(g)(1)(F), the requirements of subdivision (d) of this rule do not apply to emergency IC engines that are exempted under Rule 1304. Therefore the

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provisions of this rule do not apply.

<b>Rule 1470</b>	<b>Requirements for Stationary Diesel-Fueled Internal Combustion and Other Compression Ignition engines</b>	<b>March 4, 2005</b>
	<p>This rule applies to any person who owns or operates a stationary compression ignition engine in the SCAQMD with a rated brake horsepower greater than 50. Rule 1470 was adopted on April 2, 2004 to implement CARB's Airborne Toxic Control Measure (ACTM) for Stationary Compression-Ignition (CI) engines and was subsequently amended on March 4, 2005, November 3, 2006 and June 1, 2007 to implement various amendments that CARB made to this ACTM. Rule 1470 currently requires new CI engines 175 bhp or greater must meet applicable Interim Tier 4 requirements on and after January 1, 2011.</p> <p>Pursuant to the subsections (c) and (d) of this rule, the engine is expected to operate in compliance with the following requirements:</p> <p>(c)(1)(A): The IC engine(s) will use CARB diesel fuel with a sulfur content of 15 ppm or less by weight as specified in permit condition B61.6. Compliance is expected.</p> <p>(c)(2)(C)(i): As required under this subparagraph of the rule, the engine(s) complies with the interim Tier 4 diesel PM standard of 0.015 gr/bhp-hr through the use of a CARB-verified diesel particulate filter (DPF) with a control efficiency of 85% or higher. Compliance is expected.</p> <p>(c)(2)(C)(iv)(II): As required under this subparagraph, the engine(s) meets Tier 3 standards for HC, NOx, NMHC+NOx and CO. The manufacturer's certified emissions data are shown in Attachment 2. Per subparagraph (f)(1)(B) of Rule 1470, the manufacturer's certified emissions data may be used to meet the emission data requirements of subparagraph (c)(2) of this rule. Compliance is expected.</p> <p>(d): Tesoro has submitted all the required information pursuant to subparagraph (d)(1) and (d)(4) to the District and a non-resettable totalizing timer will be installed on the engine pursuant to condition K12.2 to indicate the total elapsed operating time as required by subparagraph (d)(7). As required by subparagraph (d)(9), the engine is tagged with permit condition K67.13 to ensure the operator will conduct and maintain proper record keeping to demonstrate compliance with the limit on M&amp;T and engine operations. Compliance is expected.</p>	

**Reg XVII**

<b>Rule 1701</b>	<b>Prevention of Significant Deterioration</b>	<b>August 13, 1999</b>
	<p>The proposed project does not result in a significant increase, as defined in Rule 1702 (s), of criteria air pollutants and the increase in attainment air pollutant (CO) is well below the threshold specified in Rule 1701 (b)(2)(A). Therefore, the provisions of Reg XVII do not apply.</p>	

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<b>Rule 1714</b>	<b>Prevention of Significant Deterioration for Greenhouse Gases</b>	<b>November 5, 2010</b>
	The requirements of Rule 1714(d) are not applicable to the new IC engine(s) because it is not a new major stationary source as defined in Rule 1702(m).	

<b>REG XX</b>	<b>RECLAIM</b>	
<b>Rule 2005</b>	<b>New Source Review for RECLAIM</b>	<b>May 6, 2005</b>
	<p>Tesoro is a NOx and SOx Cycle 1 RECLAIM facility. As such the provisions of this rule apply. The three engines are subject to NOx and SOx BACT pursuant to Section (c) and (d) of this rule because of post modification increase in hourly NOx emissions. As shown in Table 6, an increase of 195 lb/yr of NOx is anticipated from this entire project.</p> <p>(c)(1)(A): The new emergency IC engine(s) complies with BACT for NOx and SOx as discussed under Reg XIII. Compliance is expected.</p> <p>(c)(1)(B): The new emergency IC engine(s) is exempt from modeling requirement pursuant to Rule 2005(k)(5).</p> <p>(c)(2): Based on the NOx RTC holding of 436,246 pounds as of 1/1/11 (verified by RECLAIM Administration team on 4/27/11), the facility currently hold sufficient RTCs to offset the annual emissions increase for the first year of operation at a 1-to-1 ratio for NOx. As shown in Table 6, no annual emissions increase for SOx is expected. Compliance is expected.</p>	

<b>REG XXX</b>	<b>TITLE V PERMITS</b>	
<b>Rule 3002</b>	<b>Requirements</b>	<b>November 14, 1997</b>
	<p>The Los Angeles Refinery has been designated as a Title V facility. The initial Title V permit was issued on November 23, 2009. Per AQMD guidelines for Title V permits, installation of new equipment subject to a NSPS pursuant to 40 CFR Part 60 or a NESHAP pursuant to 40 CFR Part 61 or 63 is considered a significant Title V permit revision. Significant revisions require a 30-day public notice and a 45-day EPA review per District's Reg XXX.</p> <p>Since the new emergency IC engine(s) is subject to NSPS IIII, issuance of the permit(s) to construct and incorporating the new engine(s) in Section H of the Facility Permit will constitute a Significant Title V permit revision. Therefore, public notice will be issued and a copy of the proposed permit and engineering evaluation will be submitted to EPA for review. Compliance is expected.</p>	

**PART 2**

**STATE REGULATIONS**

	<b>California Environmental Quality Act (CEQA)</b>
	CEQA requires that the environmental impact of proposed projects be evaluated and that feasible measures to reduce, avoid or eliminate identified significant adverse impacts be considered. The CEQA Applicability Form (400-CEQA) submitted by the applicant indicates the project does not have any impacts which would trigger the preparation of a CEQA document. Hence, a CEQA analysis is not required.

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**CONCLUSION:**

Based on this evaluation, the new stationary emergency diesel-fueled IC engine(s) are expected to operate in compliance with AQMD, State and Federal Rules and Regulations. Therefore, Permits to Construct are recommended for the 3 identical emergency fire IC engines with the conditions listed on pages 3 through 7 of this evaluation.

The following is a summary of the permit action under this evaluation:

A/N	Equipment Description	Device ID	Recommended Action
520667	Title V Permit Revision	-	Approve
520668	ICE, 460 kW (617 BHP), EMERGENCY FIRE PUMP, DIESEL FUEL, JOHN DEERE, MODEL 6135HFC48B, SERIAL NO. RG6135L014602	Dxxx	Approve PC
520669	ICE, 460 kW (617 BHP), EMERGENCY FIRE PUMP, DIESEL FUEL, JOHN DEERE, MODEL 6135HFC48B, SERIAL NO. RG6135L018321	Dxxx	Approve PC
520670	ICE, 400 kW (617 BHP), EMERGENCY FIRE PUMP, DIESEL FUEL, JOHN DEERE, MODEL 6135HFC48B, SERIAL NO. RG6135L018323	Dxxx	Approve PC

# **Attachment Index**

<b>1</b>	<b>2-Year compliance history</b>
<b>2</b>	<b>New Engine Certified Emissions Data</b>
<b>3</b>	<b>D1123 and D1659 Emissions</b>
<b>4</b>	<b>Aerial View of Engine Locations to Nearest School</b>

# **Attachment 1**

## **Attachment 2**

# **Attachment 3**

# **Attachment 4**

**END OF EVALUATION**