



OCT 15 2009

Mike Tollstrup, Chief
Project Assessment Branch
Stationary Source Division
California Air Resources Board
PO Box 2815
Sacramento, CA 95812-2815

**Re: Notice of Preliminary Decision - Authority to Construct
Project Number: N-1082003**

Dear Mr. Tollstrup:

Enclosed for your review and comment is the District's analysis of City of Stockton's application for an Authority to Construct for the permitting of a natural gas fired, lean-burn, emergency engine powering an electrical generator, located at Sanguinetti Lane and the diverting canal, Stockton.

The notice of preliminary decision for this project will be published approximately three days from the date of this letter. Please submit your written comments on this project within the 30-day public comment period which begins on the date of publication of the public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Mr. Fred Cruz of Permit Services at (209) 557-6456.

Sincerely,



David Warner
Director of Permit Services

DW:FJC/lis

Enclosure

Seyed Sadredin
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
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San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT



OCT 15 2009

Amin Kazemi
City of Stockton
2500 Navy Drive
Stockton, CA 95206-1191

Re: Notice of Preliminary Decision - Authority to Construct
Project Number: N-1082003

Dear Mr. Kazemi:

Enclosed for your review and comment is the District's analysis of City of Stockton's application for an Authority to Construct for the permitting of a natural gas fired, lean-burn, emergency engine powering an electrical generator, located at Sanguinetti Lane and the diverting canal, Stockton.

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San Joaquin Valley Air Pollution Control District
Application Review
Natural Gas-Fired Emergency IC Engine

Facility Name: City of Stockton – Utilities Department Date: September 3, 2009
Mailing Address: 2500 Navy Drive Engineer: Fred Cruz
Stockton, CA 95206-1191 Lead Engineer: Nick Peirce
Contact Person: Amin Kazemi
Telephone: (209) 937-8716
Application No: N-2557-4-1
Project No: N-1082003
Complete: August 26, 2009

I. PROPOSAL:

The District issued ATC N-2557-4-0 to the City of Stockton. This ATC permit could not be implemented, so the City of Stockton submitted an Authority to Construct application to modify the NOx and CO emission factors for this lean-burn natural gas fired emergency engine that will power an electrical generator located at the City of Stockton's storm water run off site. ATC N-2557-4-1 will be treated as a new emissions unit.

II. APPLICABLE RULES:

Rule 2201 New and Modified Stationary Source Review Rule (Amended 9/21/2006)
Rule 2520 Federally Mandated Operating Permits (Amended 6/21/2001)
Rule 4101 Visible Emissions (Amended 11/15/2001)
Rule 4102 Nuisance (Amended 12/17/1992)
Rule 4201 Particulate Matter Concentration (Amended 12/17/1992)
Rule 4701 Stationary Internal Combustion Engines – Phase 1 (Amended 8/21/2003)
Rule 4702 Stationary Internal Combustion Engines – Phase 2 (Amended 1/18/2007)
Rule 4801 Sulfur Compounds (Amended 12/17/1992)
CH&SC42301.6 School notice requirements

III. PROJECT LOCATION:

The equipment will be operated at Sanguinetti Lane and the diverting canal, Stockton, CA. The applicant states that the equipment is not located within 1,000 feet of a K-12 school. (See site map.)

IV. PROCESS DESCRIPTION:

The emergency engine powers an electrical generator. Other than emergency operation, the engine may be operated up to 100 hours per year for maintenance and testing purposes.

V. EQUIPMENT LISTING:

N-2557-4-1: 1234 BHP WAUKESHA MODEL VGF P48GLD (LEAN BURN) NATURAL GAS FIRED EMERGENCY ENGINE POWERING AN 825 KW ELECTRICAL GENERATOR.

VI. EMISSION CONTROL TECHNOLOGY EVALUATION:

The engine is equipped with:

- Positive Crankcase Ventilation (PCV) or 90% efficient control device
- Non-Selective Catalytic Reduction (oxidation catalyst, 80% control of CO emissions, and 50% control of VOC emissions)
- Lean Burn Technology
- Selective Catalytic Reduction (80% control of NO_x emissions)

Lean burn technology increases the volume of air in the combustion process and therefore increases the heat capacity of the mixture. This technology also incorporates improved swirl patterns to promote thorough air/fuel mixing. This in turn lowers the combustion temperature and reduces NO_x formation.

VII. GENERAL CALCULATIONS:

A. Assumptions

Emergency operating schedule:	24 hours/day
Non-emergency operating schedule:	100 hours/year
EPA F-factor (adjusted to 60°F):	8,578 dscf/MMBtu (40 CFR 60 Appendix B)
Fuel heating value:	1,000 Btu/scf (District Policy APR 1720)
Sulfur concentration:	2.85 lb/MMscf (District Policy APR 1720)
BHP to Btu/hr conversion:	2,542.5 Btu/hp · hr
Thermal efficiency of engine:	commonly ≈ 35%

B. Emission Factors

The applicant provided the emission factors for NO_x and CO emissions and the engine manufacturer provided the emission factor for VOC emissions. The PM₁₀ and SO_x emission factors will be calculated below.

NO _x :	1.50 g/bhp-hr
CO:	1.75 g/bhp-hr
VOC:	0.75 g/bhp-hr
PM ₁₀ :	0.04 g/bhp-hr
SO _x :	0.01 g/bhp-hr

PM10 and SOx emission factors will be calculated as follows:

Brake Specific Fuel Consumption (BSFC):

Per the engine manufacturer, this engine's fuel consumption at 100% load is 9,509 scf/hr. Therefore, the engine's BSFC will equal:

$$\frac{(9,509 \text{ scf/hr}) (1,000 \text{ Btus/scf})}{1,234 \text{ bhp}} = 7,706 \text{ Btu/hp-hr}$$

PM₁₀ value includes both filterable (7.71x10⁻⁵ lb/MMBtu) and condensable (9.91x10⁻³ lb/MMBtu) emissions.

$$\text{PM}_{10} \text{ EF: } \frac{(7.71 \times 10^{-5} + 9.91 \times 10^{-3}) \text{ lb-PM}_{10}}{10^6 \text{ Btus}} \times (7,706 \text{ Btu/hp-hr}) \times (453.6 \text{ g/lb})$$

$$= 0.04 \text{ g-PM}_{10}/\text{hp-hr}$$

$$\text{SO}_x: \frac{(0.00285 \text{ lb-SO}_x)}{10^6 \text{ Btus}} \times (7,706 \text{ Btu/hp-hr}) \times (453.6 \text{ g/lb})$$

$$= 0.01 \text{ g-SO}_x/\text{hp-hr}$$

C. Calculations

1. Potential to Emit (PE)

The potential to emit for this emergency IC engine is based on the maximum operating capacity of the engine based on 24 hours per day. The District issued Authority to Construct N-2557-4-0 for a natural gas fired emergency engine served by a SCR system. The applicant did not install the SCR system and submitted this ATC application to revise the NO_x and CO emissions factor. Since ATC N-2557-4-0 could not be implemented into a Permit to Operate, this emergency engine will be evaluated as a new emissions unit at the facility and the pre-project emissions will equal zero for all pollutants.

The following calculation for NO_x emissions is representative of emission calculations for all pollutants for post project emissions. Annual emissions are based on 100 hours per year of non-emergency operation.

$$\text{NO}_x: 1.50 \text{ g/hp-hr} \times 1,234 \text{ hp} \times \text{lb}/453.6 \text{ g}$$

$$\text{NO}_x: \underline{4.08 \text{ lb/hr, 97.9 lb/day, 408 lb/yr}}$$

$$\text{CO: } \underline{4.76 \text{ hr, 114.3 lb/day, 476 lb/yr}}$$

$$\text{VOC: } \underline{2.04 \text{ lb/hr, 49.0 lb/day, 204 lb/yr}}$$

$$\text{PM}_{10}: \underline{0.11 \text{ lb/hr, 2.6 lb/day, 11 lb/yr}}$$

$$\text{SO}_x: \underline{0.03 \text{ lb/hr, 0.7 lb/day, 3 lb/yr}}$$

	NO _x	CO	VOC	PM ₁₀	SO _x
Daily PE	97.9	114.3	49.0	2.6	0.7
Annual PE	408	476	204	11	3

2. Facility Emissions:

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 ATCs or PTOs at the Stationary Source and the quantity of Emission Reduction Credits (ERCs) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

Pre Project Stationary Source Potential to Emit (SSPE1):

Permit No.	NO _x	CO	VOC	PM ₁₀	SO _x
N-2557-1-1	239	393	3	2	0
N-2557-2-1	239	393	3	2	0
N-2557-3-0	32	128	32	13	2
N-2557-4-0	0	0	0	0	0
Total:	510	914	38	17	2

See Appendix B for SSPE calculations.

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 ATCs or PTOs, except for emissions units proposed to be shut down as part of the Stationary Project, at the Stationary Source and the quantity of Emission Reduction Credits (ERCs) 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.

Permit No.	NO _x	CO	VOC	PM ₁₀	SO _x
N-2557-1-1	239	393	3	2	0
N-2557-2-1	239	393	3	2	0
N-2557-3-0	32	128	32	13	2
N-2557-4-1	408	476	204	11	3
Total:	918	1390	242	28	5

3. Major Source Determination

A Major Source is a source with an SSPE2⁽¹⁾ that equals or exceeds any of the following Major Source thresholds. The following table compares the pre-project and post-project facility-wide annual emissions to determine if the facility is already an existing Major Source or if the facility is becoming a Major Source as the result of this project.

This facility does not have any ERCs, which have been banked at the source. Therefore, an adjustment to SSPE2 is not necessary.

Major Source Determination					
Pollutant	SSPE1	SSPE2	Major Source Threshold	Existing Major Source?	Becoming a Major Source?
NO _x	510 lb/year	918 lb/year	50,000 lb/year	No	No
SO _x	2 lb/year	5 lb/year	140,000 lb/year	No	No
PM ₁₀	17 lb/year	28 lb/year	140,000 lb/year	No	No
CO	914 lb/year	1,390 lb/year	200,000 lb/year	No	No
VOC	38 lb/year	242 lb/year	50,000 lb/year	No	No

4. Baseline Emissions (BE)

BE = Pre-project Potential to Emit for:

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

Otherwise, BE will equal the Historic Actual Emissions (HAE), calculated per Section 3.23. Since this facility is not a Major Source for any pollutant, BE will equal the PE.

Since this is a new emissions unit, BE equals 0 for all criteria pollutants.

5. Quarterly Net Emissions Change (QNEC)

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

¹ Section 3.24.2 of District Rule 2201 states, "for the purposes of determining major source status, the SSPE2 shall not include 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.

VIII. COMPLIANCE

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

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

- a) Any new emissions unit with a potential to emit exceeding 2.0 pounds per day,
- b) The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding 2.0 pounds per day,
- c) Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding 2.0 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.

Since this engine is a new emissions unit, the daily emissions are compared to the BACT thresholds in the following table:

New Emissions Unit BACT Applicability				
Pollutant	Daily Emissions for N-2557-4-1 (lb/day)	BACT Threshold (lb/day)	SSPE2 (lb/yr)	BACT Triggered?
NO _x	97.9	> 2.0	N/A	Yes
SO _x	0.7	> 2.0	N/A	No
PM ₁₀	2.6	> 2.0	N/A	Yes
CO	114.3	> 2.0 and SSPE2 ≥ 200,000 lb/yr	1,390	No
VOC	49.0	> 2.0	N/A	Yes

2. BACT Guideline

See proposed revision to BACT Guideline 3.1.8, 3rd quarter 2009, which appears in Appendix D of this report, and covers lean burn gas-fired emergency IC engines of greater than or equal to 250 horsepower.

3. BACT Analysis

To comply with the BACT NO_x emission requirement specified in District Guideline 3.1.8 ATC N-2557-4-0 was issued with a NO_x limit of 1.0 g/bhp-hr. Research conducted at the time indicated that lean-burn natural gas fired units of this size were not capable of achieving this level without the use of an after-control system. So, the City of Stockton proposed the use of an SCR system. SCR systems do not provide NO_x control until the catalyst reaches a temperature of approximately 600 to

700 degrees F. Events that would require the duration of use necessary to bring an SCR system up to temperature would be rare, so in reality, most of the engine's operation would not allow it to reach the catalyst temperature sufficiently to provide NOx emissions control. Since most or all episodes of operation would be of short durations, the District should have set the BACT level for NOx emissions such that reductions from the use of an after-control system were not depended upon.

Current District research indicates that the engine under consideration can be tuned to achieve a NOx level of 1.5 g/bhp-hr, or less, without the use of after controls. With this project, BACT Guideline 3.1.8 will be revised to reflect an Achieved-in-Practice control technology for NOx emission of 1.5 g/bhp-hr, or less. See Appendix D for the proposed revised BACT Guideline for NOx emissions.

Per District Policy APR 1305, Section IX, "A top-down BACT analysis shall be performed as a part of the Application Review for each application subject to the BACT requirements pursuant to the District's NSR Rule for source categories or classes covered in the BACT Clearinghouse, relevant information under each of the following steps may be simply cited from the Clearinghouse without further analysis." In the attached Top-Down BACT Analysis, which appears in Appendix D, BACT is satisfied for PM10 and VOC emissions from this natural gas fired emergency engine by the following:

NOx: ≤ 1.5 g/bhp-hr
PM₁₀: Natural gas as fuel
VOC: VOC emissions of ≤ 1.0 g/hp · hr (use of lean burn natural gas-fired engine)

B. Offsets

Emergency IC engines are exempt from the offset requirements of Rule 2201. Therefore, offsets are not required for this emergency engine and offset calculations will not be presented.

C. Public Notification

1. Applicability

Public noticing is required for:

- a. New Major Sources,
- b. Major Modifications of an existing Stationary Source,
- 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 reached or surpassed, and/or
- e. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.

a. New Major Source

This is an existing facility, not a new source. Therefore, a New Major Source notification is not required.

b. Major Modification

This facility does not become a major source as a result of this project. For non-major sources, the Major Modification threshold levels are equivalent to the major source threshold levels. Therefore public noticing is not required for this project.

c. PE > 100 lb/day

As previously calculated, the daily PE for CO emissions from this new emissions unit does exceed the daily PE Public Notice Threshold of 100 lb threshold. Therefore, public noticing is required for this project.

d. Offset Threshold

The following table compares the SSPE1 with the SSPE2 to the offset thresholds to determine if any offset thresholds have been exceeded with this project.

Offset Threshold				
Pollutant	SSPE1 (lb/yr)	SSPE2 (lb/yr)	Offset Threshold (lb/yr)	Public Notice Required?
NO _x	510	918	20,000	No
SO _x	2	5	54,750	No
PM ₁₀	17	28	29,200	No
CO	914	1,390	200,000	No
VOC	38	242	20,000	No

Public noticing is not required for this project for equaling or exceeding the offset thresholds.

e. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a Stationary Source Increase in Permitted Emissions (SSIPE) of more than 20,000 lb/year for any affected pollutant. According to District policy, the SSIPE is calculated as the Post Project Stationary Source Potential to Emit (SSPE2) minus the Pre-Project Stationary Source Potential to Emit (SSPE1), i.e. SSIPE = SSPE2 – SSPE1. See table below:

SSIPE Public Notice Threshold					
Pollutant	SSPE2 (lb/yr)	SSPE1 (lb/yr)	SSIPE (lb/yr)	SSIPE Threshold (lb/yr)	Public Notice Required?
NO _x	918	510	408	20,000	No
SO _x	5	2	3	20,000	No
PM ₁₀	28	17	11	20,000	No
CO	1,390	914	476	20,000	No
VOC	242	38	204	20,000	No

Therefore, public noticing is not required for exceeding the SSIPE thresholds.

2. Public Notice Action

As discussed above, this project does result in emissions, for daily CO emissions exceeding 100 lb, which would subject the project to the public noticing requirements. Therefore, public notice will be required for this project.

D. Daily Emissions Limits

Daily Emissions Limits (DELs) are required to enforce the applicability of BACT. For this emergency IC engine, the DELs are stated in the form of emission factors, the maximum engine horsepower rating, and the maximum operational time of 24 hours per day.

E. Compliance Assurance

1. Source Testing

Pursuant to District Policy APR 1705, source testing is not required for emergency IC engines.

2. Monitoring

Additional monitoring is not required to demonstrate compliance with Rule 2201.

3. Recordkeeping

Record keeping is required to demonstrate compliance with the daily emission limit requirements of Rule 2201. Therefore, the following condition will be listed on the ATC to ensure compliance:

- The permittee shall maintain records of hours of emergency and non-emergency operation. Records shall include the date, the number of hours of operation, the purpose of the operation (e.g., load testing, weekly testing, rolling blackout, general area power outage, etc.), and the type of fuel used. Such records shall be retained on-site for a period of at least five years and made available for District inspection upon request. [District Rules 4701 and 4702]

4. Reporting

There are no additional reporting requirements necessary to ensure compliance with Rule 2201.

F. Ambient Air Quality Analysis

Section 4.14.1 of this Rule requires that an ambient air quality analysis (AAQA) be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of a State or National ambient air quality standard. An AAQA is required to be performed for all New Source Review (NSR) public notice projects. As previously discussed, this project requires a public notice be performed before issuance of the ATC for this project. Therefore, the District is required to perform an AAQA for this project.

The Technical Services Division of the SJVAPCD conducted the required AAQA for this project. The results of the AAQA are presented in the following table. Refer to Appendix E of this document for the AAQA summary and the PM₁₀ 24 hour and annual emissions contribution levels for this project.

Criteria Pollutant Modeling Results *
Values are in µg/m³

AAQA Results Summary					
Pollutant	1 hr Average	3 hr Average	8 hr Average	24 hr Average	Annual Average
CO	Pass	X	Pass	X	X
NO _x	Pass	X	X	X	Pass
SO _x	Pass	Pass	X	Pass	Pass
PM ₁₀	X	X	X	Pass ¹	Pass ¹

* Results were taken from the attached PSD spreadsheets.

1. The criteria pollutants are below EPA's level of significance as found in CFR 40 Part 51.165 (b) (2).

The criteria modeling runs for this project indicate that the emissions from the proposed natural gas fired emergency engine will not cause or significantly contribute to a violation of a State or National AAQS.

Rule 2520 Federally Mandated Operating Permits

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

Rule 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. Based on experience with similar

operations, compliance with visible emission limits is expected under normal operating conditions.

Rule 4102 Nuisance

Rule 4102 states that no air contaminant shall be released into the atmosphere, which causes a public nuisance. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, compliance with this rule is expected.

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 to an existing emissions unit, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

For the Risk Management Review, toxic emissions from the engine were calculated using Ventura County emission factors for natural gas internal combustion engines. In accordance with the District’s *Risk Management Policy for Permitting New and Modified Sources* (APR 1905-1, March 2, 2001), risks from the proposed project were prioritized using the procedures in the 1990 CAPCOA Facility Prioritization Guidelines and incorporated in the District’s HEART’s database. The prioritization score was less than 1.0 (see RMR Summary Table below). Therefore, no further analysis was required or performed for the Risk Management Review.

RMR Summary			
Categories	Emergency Natural Gas ICE (Unit 4-1)	Project Totals	Facility Totals
Prioritization Score	0.7	0.7	1.3
Acute Hazard Index	0.01	0.01	0.01
Chronic Hazard Index	0.00	0.00	0.00
Maximum Individual Cancer Risk	0	0	0
T-BACT Required?	No		
Special Permit Conditions?	No		

The acute and chronic indices for this unit are below 1.0, and the cancer risk factor is less than the 1 in a million threshold. In accordance with the District’s Risk Management Policy, the project is approved **without** Toxic Best Available Control Technology (T-BACT). See the HRA summary for this project (Appendix E). 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:

$$0.04 \frac{\text{g}}{\text{hp} \cdot \text{hr}} \times \frac{1 \text{hp} \cdot \text{hr}}{2,542.5 \text{Btu}} \times \frac{10^6 \text{Btu}}{8,578 \text{ dscf}} \times \frac{0.35 \text{Btu}_{\text{out}}}{1 \text{Btu}_{\text{in}}} \times \frac{15.43 \text{ grain}}{\text{g}} = 0.01 \frac{\text{grain}}{\text{dscf}}$$

Since $0.01 \frac{\text{grain}}{\text{dscf}}$ is \leq to 0.1 grain per dscf, compliance with Rule 4201 is expected.

Rule 4701 Stationary Internal Combustion Engines – Phase 1

Pursuant to Section 4.2.1, emergency IC engines that do not operate more than 200 hours per year for non-emergency use are exempt from the requirements of this rule except for the recordkeeping requirements. The recordkeeping condition presented in the Compliance Section of Rule 2201 above requires that the hours of non-emergency operation be recorded. No additional recordkeeping is required for this rule.

Rule 4702 Stationary Internal Combustion Engines – Phase 2

The purpose of this rule is to limit the emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC) from internal combustion engines. This rule applies to any internal combustion engine with a rated brake horsepower greater than 50 horsepower.

This engine meets the definition of an emergency standby engine as defined in Section 4.2. Per Section 4.2, except for the requirements of Sections 5.7 and 6.2.3, the requirements of this rule shall not apply to an internal combustion engine that meets the following condition:

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

Per Section 4.2.1, emergency IC engines that do not operate more than 100 hours per year for non-emergency use are exempt from the requirements of this rule except for the record keeping requirements. The record keeping condition presented in the Compliance Section of Rule 2201 above requires that the hours of non-emergency and emergency operations be recorded.

Rule 4801 Sulfur Compounds

Per Section 3.1, a person shall not discharge into the atmosphere sulfur compounds, which would exist as a liquid or gas at standard conditions, exceeding in concentration at the point of discharge: 0.2 % by volume calculated as SO₂ on a dry basis averaged over 15 consecutive minutes:

$$\text{Volume SO}_2 = nRT/P$$

$$n = \text{moles SO}_2$$

$$T (\text{standard temperature}) = 60^\circ \text{F or } 520^\circ \text{R}$$

$$R (\text{universal gas constant}) = \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot ^\circ \text{R}}$$

$$2.85 \quad \frac{\text{lb} \cdot \text{SO}_2}{\text{MMscf}_{\text{gas}}} \times \frac{1 \text{ scf}_{\text{gas}}}{1,000 \text{ Btu}} \times \frac{1 \text{ MMBtu}}{8,578 \text{ scf}_{\text{exhaust}}} \times \frac{1 \text{ lb} \cdot \text{mol}}{64 \text{ lb} \cdot \text{SO}_2} \times \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot ^\circ \text{R}} \times \frac{520^\circ \text{R}}{14.7 \text{ psi}} \times 1,000,000 \text{ ppm} = 1.97 \text{ ppmv}$$

Since 1.97 ppmv is \leq 2000 ppmv, this engine is expected to comply with Rule 4801.

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.

IX. RECOMMENDATION:

Issue ATC permit with the attached conditions. See Appendix A.

X. BILLING INFORMATION:

Permit Number	Fee Schedule	Fee Description	Previous Fee Schedule
N-2557-4-1	3020-10-F	1,234 bhp engine	None

Appendices

- A. Authority to Construct permit N-2557-4-1
- B. SSPE1 Calculations
- C. QNEC Calculations
- D. BACT Guideline and BACT Analysis
- E. RMR Summary and Ambient Air Quality Analysis (AAQA)
- F. AP-42 Emission Factors

APPENDIX A

Authority to Construct permit N-2557-4-1

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT

PERMIT NO: N-2557-4-1

LEGAL OWNER OR OPERATOR: STOCKTON MUNICIPAL UTILITY
MAILING ADDRESS: 2500 NAVY DR
STOCKTON, CA 95206

LOCATION: SANGUINETTI LN./DIVERTING CNL.
STOCKTON, CA

EQUIPMENT DESCRIPTION:
1234 BHP WAUKESHA MODEL VGF P48GLD (LEAN BURN) NATURAL GAS FIRED EMERGENCY ENGINE
POWERING AN 825 KW ELECTRICAL GENERATOR.

CONDITIONS

1. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. {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]
4. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. {3404} This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rule 4702]
6. Emissions from this IC engine shall not exceed any of the following limits: 1.50 g-NOx/bhp-hr, 0.04 g-PM10/bhp-hr, 1.75 g-CO/bhp-hr, 0.01 g-SOx/bhp-hr or 0.75 g-VOC/bhp-hr. [District Rule 2201]
7. {3405} 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]

CONDITIONS CONTINUE ON NEXT PAGE

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

Seyed Sadredin, Executive Director APCO

DAVID WARNER, Director of Permit Services

N-2557-4-1 : Sep 30 2009 2:35PM - CRUZ : Joint Inspection NOT Required

Northern Regional Office • 4800 Enterprise Way • Modesto, CA 95356-8718 • (209) 557-6400 • Fax (209) 557-6475

8. {3478} During periods of operation for maintenance, testing, and required regulatory purposes, the permittee shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or other operational characteristics as recommended by the manufacturer or supplier). [District Rule 4702]
9. {3806} This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 100 hours per calendar year. [District Rule 4702]
10. {3807} An emergency situation is an unscheduled electrical power outage caused by sudden and reasonably unforeseen natural disasters or sudden and reasonably unforeseen events beyond the control of the permittee. [District Rule 4702]
11. {3808} This engine shall not be used to produce power for the electrical distribution system, as part of a voluntary utility demand reduction program, or for an interruptible power contract. [District Rule 4702]
12. {3496} The permittee shall maintain monthly records of emergency and non-emergency operation. Records shall include the number of hours of emergency operation, the date and number of hours of all testing and maintenance operations, the purpose of the operation (for example: load testing, weekly testing, rolling blackout, general area power outage, etc.) and records of operational characteristics monitoring. For units with automated testing systems, the operator may, as an alternative to keeping records of actual operation for testing purposes, maintain a readily accessible written record of the automated testing schedule. [District Rule 4702]
13. {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]

DRAFT

APPENDIX B

SSPE1

The facility has three existing permitted emission units. Permits to Operate N-2557-1-1 and N-2557-2-1 are for existing emergency engines limited to operate for testing and maintenance purposes to 100 hours per calendar year.

Emission data for permits N-2557-1-1 and N-2557-2-1 are based on calculations performed in project 1050761.

ATC N-2557-3-0 was finalized May 2005 for this emergency engine and emission data is based on calculations performed in project 1051062.

Pre Project Stationary Source Potential to Emit (SSPE1):

Permit No.	NO _x	CO	VOC	PM ₁₀	SO _x
N-2557-1-1	239	393	3	2	0
N-2557-2-1	239	393	3	2	0
N-2557-3-0	32	128	32	13	2
Total:	510	914	38	17	2

Post Project Stationary Source Potential to Emit (SSPE2):

Permit No.	NO _x	CO	VOC	PM ₁₀	SO _x
N-2557-1-1	239	393	3	2	0
N-2557-2-1	239	393	3	2	0
N-2557-3-0	32	128	32	13	2
N-2557-4-1	408	476	204	11	3
Total:	918	1390	242	28	5

APPENDIX C

Quarterly Net Emissions Change (QNEC)

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

QNEC = PE2 - BE, where:

- QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.
- PE2 = Post Project Potential to Emit for each emissions unit, lb/qtr.
- BE = Baseline Emissions (per Rule 2201) for each emissions unit, lb/qtr.

This calculation is required for application emission profile purposes. It is assumed that each unit's annual emissions are evenly distributed throughout the year as follows: $\Delta PE \text{ (lb/qtr)} = PE \text{ (lb/yr)} \div 4 \text{ qtr/yr}$

N-2557-4-1

- $\Delta PE_{NOx} = 408 \text{ lb-NOx/year} - 0 \text{ lb-NOx/year} = 408 \text{ lb/year}$
- $\Delta PE_{CO} = 476 \text{ lb-CO/year} - 0 \text{ lb-CO/year} = 476 \text{ lb/year}$
- $\Delta PE_{VOC} = 204 \text{ lb-VOC/year} - 0 \text{ lb-VOC/year} = 204 \text{ lb/year}$
- $\Delta PE_{PM10} = 11 \text{ lb-PM10/year} - 0 \text{ lb-PM10/year} = 11 \text{ lb/year}$
- $\Delta PE_{SOx} = 3 \text{ lb-SOx/year} - 0 \text{ lb-SOx/year} = 3 \text{ lb/year}$

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
NOx	102	102	102	102
CO	119	119	119	119
VOC	51	51	51	51
PM ₁₀	2	3	3	3
SOx	0	1	1	1

Appendix D

Best Available Control Technology (BACT) Guideline 3.1.8*

Last Update: April 4, 2002

Emission Unit: Emergency Gas Fired I.C. Engine - \geq 250 hp, Lean Burn

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
NO _x	\leq 1.0 g/bhp-hr (Lean-burn natural gas fired engine, or equal)		\geq 90% control efficiency (Rich burn engine with NSCR, or equal)
VOC	\leq 1.0 g/bhp-hr (Lean-burn natural gas fired engine, or equal)	90% control efficiency (Oxidation catalyst, or equal)	\geq 50% control efficiency (Rich burn engine with NSCR, or equal)
PM ₁₀	Natural gas fuel		
CO	\leq 2.75 g/bhp-hr (Lean-burn natural gas fired engine, or equal)	90% control efficiency (Oxidation catalyst, or equal)	\geq 80% control efficiency (Rich burn engine with NSCR, or equal)

Note: Project C-1011446 C-3959-7-0 was the project that triggered this initial BACT guideline determination. As of this date, the Authorities to Construct for this project have been not implemented into active Permits to Operate and the Authorities to Construct have since expired. The Bay Area Air Quality Management District (BAAQMD) has an existing BACT Guideline for spark ignition, natural gas fired emergency engines ($>$ 50 bhp) that specifies the achieved-in-practice control technology for NO_x emissions limit as 1.0 g/bhp-hr (reference document # 96.3.4 dated May 7, 2003).

BACT Analysis

BACT Analysis for VOC Emissions

Volatile organic compound (VOC) emissions are generated from the incomplete combustion of the fuel. Some VOCs are emitted from the crankcase of the engine as a result of piston ring blow-by.

Step 1 - Identify All Possible Control Technologies

The SJVAPCD BACT Clearinghouse identifies the achieved-in-practice BACT control technology for the control of VOC emissions as the use of a lean-burn natural gas fired engine with VOC emissions of ≤ 1.0 g/hp-hr. Technologically feasible control technology options include the use of an oxidation catalyst with $\geq 90\%$ control of VOC emissions, or equal.

Step 2 - Eliminate all Technologically Infeasible Options

There are no technologically infeasible options identified above.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Use of oxidization catalyst or equal ($\geq 90\%$ control for lean-burn engine) (≈ 0.0395 g/hp·hr)¹
2. VOC emissions of ≤ 1.0 g/hp·hr (lean-burn natural gas fired)

Step 4 - Cost Effectiveness Analysis

Per District Policy APR 1305, BACT Determination Policy, a cost analysis is not required for facilities that meet the District's "small emitter" status. As indicated on page 4 of this document, the post project SSPE for each pollutant is less than 2 tons per year. Therefore, the applicant has to meet the achieved in practice control technology listed on the BACT Guideline, which the applicant has proposed.

Step 5 - Select BACT

BACT for the control of VOC emissions is the use of a lean-burn natural gas fired engine with VOC emissions less than or equal to 1.0 g/bhp-hr. Therefore, the District's BACT requirements are satisfied.

¹ The uncontrolled VOC emissions for a lean-burn natural gas fired engine are based on AP-42 Table 3.2-1 (revised July 2000) which equal 0.12 lb/MMBtu. To convert to g/bhp-hr, the following applies: $[(0.12 \text{ lb/MMBtu}) \times 2542.5 \text{ Btu/bhp-hr} \times (1 \text{ hp}_{\text{input}}/0.35 \text{ hp}_{\text{output}}) \times 453.6 \text{ g/lb}] = 0.395 \text{ g/bhp-hr}$. 90% control of VOC emissions would equal: $[0.395 \text{ g/bhp-hr} \times (1 - 0.90)] = 0.0395 \text{ g/bhp-hr}$.

BACT Analysis for PM₁₀ emissions

Particulate matter (PM₁₀) emissions result from the incomplete combustion of various elements in the fuel. A small portion of the particulates is emitted through the crankcase vent.

Step 1 - Identify All Possible Control Technologies

The SJVAPCD BACT Clearinghouse identifies the achieved-in-practice BACT control technology for this engine as the use of natural gas for fuel. There are no technologically feasible alternatives or control alternatives identified as alternate basic equipment for this class and category of source.

Step 2 - Eliminate Technologically Infeasible Options

There are no technologically infeasible options identified above.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Natural gas as fuel

Step 4 - Cost Effectiveness Analysis

The only control technology alternative in the ranking list from Step 3 has been achieved in practice. Therefore, per SJVAPCD BACT policy, the cost effectiveness analysis is not required.

Step 5 - Select BACT

BACT for PM₁₀ emissions for this engine is satisfied with the use of natural gas as fuel. The facility has proposed to install an IC engine using natural gas as fuel; therefore, BACT is satisfied.

APPENDIX E

RMR Summary and Ambient Air Quality Analysis (AAQA)

San Joaquin Valley Air Pollution Control District Risk Management Review

To: Fred Cruz – Permit Services
 From: Cheryl Lawler – Technical Services
 Date: September 24, 2009
 Facility Name: City of Stockton
 Location: Sanguinetti Lane & Diverting Canal, Stockton
 Application #(s): N-2557-4-1
 Project #: N-1082003

A. RMR SUMMARY

RMR Summary			
Categories	Emergency Natural Gas ICE (Unit 4-1)	Project Totals	Facility Totals
Prioritization Score	0.06*	0.06	0.06
Acute Hazard Index	N/A	N/A	N/A
Chronic Hazard Index	N/A	N/A	N/A
Maximum Individual Cancer Risk	N/A	N/A	N/A
T-BACT Required?	No		
Special Permit Conditions?	No		

*Project passed on prioritization with a score less than 1; therefore, no further analysis was required.

B. RMR REPORT

I. Project Description

Technical Services received a request on September 15, 2009, to perform an Ambient Air Quality Analysis and a Risk Management Review for the installation of a 1,234 bhp natural gas emergency IC engine powering an electrical generator.

II. Analysis

For the Risk Management Review, toxic emissions from the engine were calculated using Ventura County emission factors for natural gas internal combustion engines with controls. In accordance with the District's *Risk Management Policy for Permitting New and Modified Sources* (APR 1905-1, March 2, 2001), risks from the proposed project were prioritized using the procedures in the 1990 CAPCOA Facility Prioritization Guidelines and incorporated in the District's HEART's database. The prioritization score was less than 1.0 (see RMR Summary Table). Therefore, no further analysis was required or performed for the Risk Management Review.

The following parameters were used for the review:

Analysis Parameters Unit 4-1			
Source Type	Point	Closest Receptor (m)	16.76
Stack Height (m)	3.96	Closest Receptor Type	Residence
Inside Diameter (m)	0.36	Project Location Type	Urban
Gas Exit Temperature (K)	722	Stack Gas Velocity (m/s)	30.08

Technical Services also performed modeling for criteria pollutants CO, NO_x, SO_x, and PM₁₀; as well as the RMR. The emission rates used for criteria pollutant modeling were 4.76 lb/hr CO, 4.08 lb/hr NO_x, 0.03 lb/hr SO_x, and 0.11 lb/hr PM₁₀.

The results from the Criteria Pollutant Modeling are as follows:

Criteria Pollutant Modeling Results*
Values are in $\mu\text{g}/\text{m}^3$

Unit 4-1	1 Hour	3 Hours	8 Hours	24 Hours	Annual
CO	Pass	X	Pass	X	X
NO _x	Pass	X	X	X	Pass
SO _x	Pass	Pass	X	Pass	Pass
PM ₁₀	X	X	X	Pass	Pass

*Results were taken from the attached PSD spreadsheets.

[†]The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2).

III. Conclusion

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

The prioritization score for the project was not above 1.0. In accordance with the District's Risk Management Policy, the project is approved **without** Toxic Best Available Control Technology (T-BACT).

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

AAQA for City of Stockton (N-2557-4-1)

All Values are in ug/m³

	NOx 1 Hour	NOx Annual	CO 1 Hour	CO 8 Hour	SOx 1 Hour	SOx 3 Hour	SOx 24 Hour	SOx Annual	PM 24 Hour	PM Annual
NGICE	1.226E+02	5.625E-02	1.908E+02	1.284E+02	1.202E+00	1.019E+00	5.833E-01	5.514E-04	2.139E+00	2.022E-03
Background	1.263E+02	3.061E+01	3.029E+03	1.864E+03	3.464E+02	1.998E+02	8.260E+01	1.865E+01	1.050E+02	3.400E+01
Facility Totals	2.489E+02	3.067E+01	3.220E+03	1.992E+03	3.476E+02	2.009E+02	8.318E+01	1.865E+01	1.071E+02	3.400E+01
AAQS	338	56	23000	10000	655	1300	105	80	50	30
	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Fail	Fail

EPA's Significance Level (ug/m³)

NOx 1 Hour	NOx Annual	CO 1 Hour	CO 8 Hour	SOx 1 Hour	SOx 3 Hour	SOx 24 Hour	SOx Annual	PM 24 Hour	PM Annual
0.0	1.0	2000.0	500.0	0.0	25.0	5.0	1.0	5.0	1.0

AAQA Emission (g/sec)

Device	NOx 1 Hour	NOx Annual	CO 1 Hour	CO 8 Hour	SOx 1 Hour	SOx 3 Hour	SOx 24 Hour	SOx Annual	PM 24 Hour	PM Annual
NGICE	5.14E-01	5.87E-03	6.00E-01	6.00E-01	3.78E-03	3.78E-03	3.78E-03	4.31E-05	1.39E-02	1.58E-04

APPENDIX F

AP-42 Emission Factor Tables for rich-burn
and lean-burn natural gas fired engines

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES^a
(SCC 2-02-002-54)

Pollutant	Emission Factor (lb/MMBtu) ^b (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO _x ^c 90 - 105% Load	4.08 E+00	B
NO _x ^c <90% Load	8.47 E-01	B
CO ^c 90 - 105% Load	3.17 E-01	C
CO ^c <90% Load	5.57 E-01	B
CO ₂ ^d	1.10 E+02	A
SO ₂ ^e	5.88 E-04	A
TOC ^f	1.47 E+00	A
Methane ^g	1.25 E+00	C
VOC ^h	1.18 E-01	C
PM10 (filterable) ⁱ	7.71 E-05	D
PM2.5 (filterable) ⁱ	7.71 E-05	D
PM Condensable ^j	9.91 E-03	D
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane ^k	<4.00 E-05	E
1,1,2-Trichloroethane ^k	<3.18 E-05	E
1,1-Dichloroethane	<2.36 E-05	E
1,2,3-Trimethylbenzene	2.30 E-05	D
1,2,4-Trimethylbenzene	1.43 E-05	C
1,2-Dichloroethane	<2.36 E-05	E
1,2-Dichloropropane	<2.69 E-05	E
1,3,5-Trimethylbenzene	3.38 E-05	D
1,3-Butadiene ^k	2.67E-04	D
1,3-Dichloropropene ^k	<2.64 E-05	E
2-Methylnaphthalene ^k	3.32 E-05	C
2,2,4-Trimethylpentane ^k	2.50 E-04	C
Acenaphthene ^k	1.25 E-06	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu) ^b (fuel input)	Emission Factor Rating
Acenaphthylene ^k	5.53 E-06	C
Acetaldehyde ^{k,l}	8.36 E-03	A
Acrolein ^{k,l}	5.14 E-03	A
Benzene ^k	4.40 E-04	A
Benzo(b)fluoranthene ^k	1.66 E-07	D
Benzo(e)pyrene ^k	4.15 E-07	D
Benzo(g,h,i)perylene ^k	4.14 E-07	D
Biphenyl ^k	2.12 E-04	D
Butane	5.41 E-04	D
Butyr/Isobutyraldehyde	1.01 E-04	C
Carbon Tetrachloride ^k	<3.67 E-05	E
Chlorobenzene ^k	<3.04 E-05	E
Chloroethane	1.87 E-06	D
Chloroform ^k	<2.85 E-05	E
Chrysene ^k	6.93 E-07	C
Cyclopentane	2.27 E-04	C
Ethane	1.05 E-01	C
Ethylbenzene ^k	3.97 E-05	B
Ethylene Dibromide ^k	<4.43 E-05	E
Fluoranthene ^k	1.11 E-06	C
Fluorene ^k	5.67 E-06	C
Formaldehyde ^{k,l}	5.28 E-02	A
Methanol ^k	2.50 E-03	B
Methylcyclohexane	1.23 E-03	C
Methylene Chloride ^k	2.00 E-05	C
n-Hexane ^k	1.11 E-03	C
n-Nonane	1.10 E-04	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu) ^b (fuel input)	Emission Factor Rating
n-Octane	3.51 E-04	C
n-Pentane	2.60 E-03	C
Naphthalene ^k	7.44 E-05	C
PAH ^k	2.69 E-05	D
Phenanthrene ^k	1.04 E-05	D
Phenol ^k	2.40 E-05	D
Propane	4.19 E-02	C
Pyrene ^k	1.36 E-06	C
Styrene ^k	<2.36 E-05	E
Tetrachloroethane ^k	2.48 E-06	D
Toluene ^k	4.08 E-04	B
Vinyl Chloride ^k	1.49 E-05	C
Xylene ^k	1.84 E-04	B

^a Reference 7. Factors represent uncontrolled levels. For NO_x, CO, and PM₁₀, "uncontrolled" means no combustion or add-on controls; however, the factor may include turbocharged units. For all other pollutants, "uncontrolled" means no oxidation control; the data set may include units with control techniques used for NO_x control, such as PCC and SCR for lean burn engines, and PSC for rich burn engines. Factors are based on large population of engines. Factors are for engines at all loads, except as indicated. SCC = Source Classification Code. TOC = Total Organic Compounds. PM-10 = Particulate Matter ≤ 10 microns (μm) aerodynamic diameter. A "<" sign in front of a factor means that the corresponding emission factor is based on one-half of the method detection limit.

^b Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/10⁶ scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation:

$$\text{lb/hp-hr} = (\text{lb/MMBtu}) (\text{heat input, MMBtu/hr}) (1/\text{operating HP, 1/hp})$$

^c Emission tests with unreported load conditions were not included in the data set.

^d Based on 99.5% conversion of the fuel carbon to CO₂. CO₂ [lb/MMBtu] = (3.67)(%CON)(C)(D)(1/h), where %CON = percent conversion of fuel carbon to CO₂, C = carbon content of fuel by weight (0.75), D = density of fuel, 4.1 E+04 lb/10⁶ scf, and

- h = heating value of natural gas (assume 1020 Btu/scf at 60°F).
- ^e Based on 100% conversion of fuel sulfur to SO₂. Assumes sulfur content in natural gas of 2,000 gr/10⁶ scf.
- ^f Emission factor for TOC is based on measured emission levels from 22 source tests.
- ^g Emission factor for methane is determined by subtracting the VOC and ethane emission factors from the TOC emission factor. Measured emission factor for methane compares well with the calculated emission factor, 1.31 lb/MMBtu vs. 1.25 lb/MMBtu, respectively.
- ^h VOC emission factor is based on the sum of the emission factors for all speciated organic compounds less ethane and methane.
- ⁱ Considered $\leq 1 \mu\text{m}$ in aerodynamic diameter. Therefore, for filterable PM emissions, PM10(filterable) = PM2.5(filterable).
- ^j PM Condensable = PM Condensable Inorganic + PM-Condensable Organic
- ^k Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.
- ^l For lean burn engines, aldehyde emissions quantification using CARB 430 may reflect interference with the sampling compounds due to the nitrogen concentration in the stack. The presented emission factor is based on FTIR measurements. Emissions data based on CARB 430 are available in the background report.

ATTACHMENT A

EPA RACT/BACT/LAER Clearinghouse



http://cfpub.epa.gov/rblc/cfm/ProcDetl.cfm?facnum=26968&Procnum=107101
 Last updated on Thursday, September 3rd, 2009.

Technology Transfer Network
 Clean Air Technology Center - RACT/BACT/LAER Clearinghouse

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Process Information - Details

For information about the pollutants related to this process, click on the specific pollutant in the list below.

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DRAFT

RBLC ID: LA-0232
Corporate/Company: GULF CROSSING PIPELINE CO. LLC.
Facility Name: STERLINGTON COMPRESSOR STATION
Process: EMERGENCY BACKUP GENERATOR

Primary Fuel: NATURAL GAS
Throughput:
Process Code: 17.130

Pollutant Information - List of Pollutants

[Help](#)

Pollutant	Primary Emission Limit	Basis	Verified
<u>Volatile Organic Compounds (VOC)</u>	1.3900 LB/H	BACT-PSD	UNKNOWN
<u>Nitrogen Oxides (NOx)</u>	4.8000 LB/H	BACT-PSD	UNKNOWN

Process Notes: 838 HP



http://cfpub.epa.gov/rblc/cfm/ProcDetl.cfm?facnum=26582&Procnum=105281
 Last updated on Thursday, September 3rd, 2009.

Technology Transfer Network
 Clean Air Technology Center - RACT/BACT/LAER Clearinghouse

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Process Information - Details

For information about the pollutants related to this process, click on the specific pollutant in the list below.

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FINAL

RBLC ID: MD-0036
Corporate/Company: DOMINION COVE POINT LNG, L.P.
Facility Name: DOMINION
Process: EMERGENCY GENERATOR (NATURAL GAS)

Pollutant Information - List of Pollutants

[Help](#)

Primary Fuel: NATURAL GAS
Throughput:
Process Code: 17.130

Pollutant	Primary Emission Limit	Basis	Verified
<u>Nitrogen Oxides (NOx)</u>	2 G/B-HP-H	BACT-PSD	UNKNOWN
<u>Carbon Monoxide</u>	1,5000 G/B-HP-H	BACT-PSD	UNKNOWN
<u>Particulate matter, filterable < 10 μ (FPM10)</u>	0.0099 LB/MMBTU	BACT-PSD	UNKNOWN
<u>Volatile Organic Compounds (VOC)</u>	0.6000 G/B-HP-H	LAER	UNKNOWN

Process Notes: CATERPILLAR MODEL #G2516LE; 770 KW (1,085 BHP); LIMIT ON OPERATIONS OF NO MORE THAN 200 HOURS DURING ANY CONSECUTIVE 12-MONTH PERIOD

ATTACHMENT B

**South Coast Air Quality Management District
(SCAQMD) BACT Guideline for Spark-ignited
Emergency IC Engines at
Stationary Sources**

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities***

10-20-2000 Rev. 0
6-6-2003 Rev. 1
12-3-2004 Rev. 2
7-14-2006 Rev. 3

Equipment or Process: I.C. Engine, Stationary, Emergency¹⁾

Criteria Pollutants							
Subcategory/	Rating/Size	NMHC or VOC	NOx	NOx + NMHC ²⁾	SOx	CO	PM
Compression-Ignition ^{3) 4)}	50 ≤ HP < 100			Tier 2: 7.5 grams/kW-hr (5.6 grams/bhp-hr) Tier 3 (After 6/30/2008): 4.7 grams/kW-hr (3.5 grams/bhp-hr) (7-14-2006)	Diesel fuel sulfur content ≤ 0.05% by weight (4-10-98) On or after June 1, 2004 the user may only purchase diesel fuel with a sulfur content no greater than 0.0015% by weight (Rule 43.1.2). (6-6-2003)	Tier 2 or Tier 3: 5.0 grams/kW-hr (3.7 grams/bhp-hr) (7-14-2006)	Compliance with Rule 1470 (12-3-2004) Tier 2 or Tier 3: 0.40 grams/kW-hr (0.30 grams/bhp-hr) (7-14-2006)
	100 ≤ HP < 175			Tier 2: 6.6 grams/kW-hr (4.9 grams/bhp-hr) Tier 3 (After 6/30/2007): 4.0 grams/kW-hr (3.0 grams/bhp-hr) (7-14-2006)		Tier 2 or Tier 3: 5.0 grams/kW-hr (3.7 grams/bhp-hr) (7-14-2006)	Compliance with Rule 1470 (12-3-2004) Tier 2 or Tier 3: 0.30 grams/kW-hr (0.22 grams/bhp-hr) (7-14-2006)
	175 ≤ HP < 300			Tier 2: 6.6 grams/kW-hr (4.9 grams/bhp-hr) Tier 3 (After 7/13/06): 4.0 grams/kW-hr (3.0 grams/bhp-hr): (7-14-2006)		Tier 2 or Tier 3: 3.5 grams/kW-hr (2.6 grams/bhp-hr) (7-14-2006)	Compliance with Rule 1470 (12-3-2004) Tier 2 or Tier 3: 0.20 grams/kW-hr (0.15 grams/bhp-hr) (7-14-2006)
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* Means those facilities that are not major polluting facilities as defined by Rule 1302 - Definitions

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Spark Ignition ⁶⁾	300 ≤ HP < 750			<u>Tier 3²⁾</u> : 4.0 grams/kW-hr (3.0 grams/bhp-hr) (7-14-2006)	<u>Tier 3:</u> 3.5 grams/kW-hr (2.6 grams/bhp-hr) (7-14-2006)	Compliance with Rule 1470 (12-3-2004) Tier 3: 0.20 grams/kW-hr (0.15 grams/bhp-hr) (7-14-2006)
	≥750 HP	<u>Tier 1 (NMHC):</u> 1.0 g/bhp-hr (4-10-98) <u>Tier 2 (After 7/13/2006):</u> See NOx+NMHC (7-14-2006)	<u>Tier 1:</u> 6.9 g/bhp-hr (4-10-98) <u>Tier 2 (After 7/13/2006):</u> See NOx+NMHC (7-14-2006)	<u>Tier 2 (After 7/13/2006):</u> 6.4 grams/kW-hr (4.8 grams/bhp-hr) (7-14-2006)	<u>Tier 1:</u> 8.5 g/bhp-hr (4-10-98) <u>Tier 2 (After 7/13/2006):</u> 3.5 grams/kW-hr (2.6 grams/bhp-hr) (7-14-2006)	Compliance with Rule 1470 (12-3-2004) Tier 1: 0.38 g/bhp-hr (4-10-98) <u>Tier 2 (After 7/13/2006):</u> 0.20 grams/kW-hr (0.15 grams/bhp-hr) (7-14-2006)
	All	VOC: 1.5 grams/bhp-hr (10-20-2000)	1.5 grams/bhp-hr (10-20-2000)		See Clean Fuels Policy in Part C of the BACT Guidelines (10-20-2000)	See Clean Fuels Policy in Part C of the BACT Guidelines (10-20-2000)

- 1) An emergency engine is an engine which operates as a temporary replacement for primary mechanical or electrical power sources during periods of fuel or energy shortage or while a primary power source is under repair. This includes fire pumps, emergency electrical generation and other emergency uses. Exceptions to the requirements in the table may be made for emergency fire pumps if it is demonstrated that there are no UL-listed fire pumps that meet the required emission limits.
- 2) NMHC + NOx means the sum of non-methane hydrocarbons and oxides of nitrogen emissions.

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- 3) AQMD restricts operation of emergency compression-ignition engines to 50 hours per year, or less if required by Rule 1470, for maintenance and testing and a maximum of 200 hours per year total operation. For engines used to drive standby generators, operation beyond 50 hours per year for maintenance and testing is allowed only in the event of a loss of grid power or up to 30 minutes prior to a rotating outage provided that the electrical grid operator or electric utility has ordered rotating outages in the control area where the engine is located or has indicated that it expects to issue such an order at a certain time, and the engine is located in a control area that is subject to the rotating outage. A new stationary compression-ignition engine will also be subject to a proposed federal New Source Performance Standard--Title 40, Part 60, Subpart IIII of the Code of Federal Regulations.
- 4) Limits with an associated "after" date are required for an engine for which the application is deemed complete after that date. Limits without an associated "after" date are required now. The engine must be certified by U.S. EPA or CARB to meet the Tier 1, 2 or 3 emission requirements of 40 CFR Part 89 - Control of Emissions from New and In-use Nonroad Compression-Ignition Engines shown in the table-- or otherwise demonstrate that it meets the Tier 1, 2 or 3 emission limits. If, because of the averaging, banking, and trading program, there is no new engine from any manufacturer that meets the above standards, then the engine must meet the family emission limits established by the manufacturer and approved by U.S. EPA. The PM limits apply only to filterable PM.
- 5) A USEPA settlement with certain engine manufacturers caused Tier 3 engines to become available one year earlier than the date specified in Part 89 for engines in the 300 hp to <750 hp size range.
- 6) AQMD restricts operation of emergency spark-ignition engines to 50 hours per year for maintenance and testing and a maximum of 200 hours per year total operation. For emergency spark-ignition engines used to drive standby generators, operation beyond 50 hours per year for maintenance and testing is allowed only during emergencies resulting in an interruption of service of the primary power supply or during Stage II or III electrical emergencies declared by the electrical grid operator. Operators are allowed to use emergency spark-ignition engines as part of an interruptible electric service program. An interruptible electric service program is a program in which the facility receives payment or reduced rates in return for a requirement to reduce its electric load on the grid when requested to do so by the utility, the grid operator, or other organization.

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