

TECHNICAL REPORT

HENRIETTA PEAKER PROJECT
(01-AFC-18)

PETITION FOR
MINOR AIR QUALITY AMENDMENT

SEPTEMBER 2003

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1.0 OVERVIEW

GWF Energy, LLC received approval on March 7, 2002 from the California Energy Commission (CEC) for the Henrietta Peaker Project (HPP), a 91.4 MW peak load power plant located in Kings County, California. The HPP commenced commercial operation on July 1, 2002.

This petition is being submitted to substitute a 300 kilowatt (kW) (471 horsepower (hp) emergency diesel engine generator (“emergency generator”) for the 250 kW (382 hp) emergency generator that was originally licensed and to modify two air quality conditions related to that emergency generator, AQ-53 and AQ-54, to reflect the lower emission rates. The proposed substitute emergency generator utilizes a “cleaner” ARB certified Clean Diesel Engine.

This petition is consistent with recent action taken by the San Joaquin Valley Air Pollution Control District (SJVAPCD) to propose approval for the requested emergency generator substitution. Appendix B includes the complete SJVAPCD proposed decision and supporting engineering analysis. A final SJVAPCD Authority to Construct is expected on or about October 4, 2003.

This petition for a post-certification amendment for the HPP is being submitted under the provisions of Section 1769 of Title 20, California Administrative Code (CEC *Rules of Practice and Procedure and Power Plant Site Certification Regulations*) to seek a minor modification to the air quality conditions of certification. The petition is organized to address the informational requirements of Section 1769 in the order they appear in the section. The requirement appears in ***bold italics*** followed by a narrative response.

2.0 INFORMATION REQUIRED BY SECTION 1769

(A) A complete description of the proposed modifications, including new language for any conditions that will be affected

This petition is to revise two air quality conditions of certification AQ-53 and AQ-54, to reflect the proposed substitution of a 300 kW (471 hp) lower-emitting emergency generator for the 250 kW (382 hp) emergency generator originally approved. The operation of the emergency generator would continue to be limited to less than 200 hours per year. In addition, total facility annual emission limits will remain unchanged. The specific language of the proposed amended conditions is included in Appendix A. The Staff of the SJVAPCD have already proposed approval of these amendments (see Appendix B). The proposed changes are based on maintaining consistency with the proposed SJVAPCD Authority to Construct. The changes are summarized in Table 1 and each item is discussed below.

Table 1. Summary of Requested Changes to Air Quality Conditions

Parameter	CEC Condition	Original Limit	Proposed Limit
Engine NO _x , CO, VOC and SO ₂ emissions	AQ-53	NO _x - 5.09 g/hp-hr CO, VOC, SO ₂ – no limit specified ¹	NO _x - 4.69 g/hp/hr CO ¹ - 0.12 g/hp/hr VOC ¹ - 0.04 g/hp/hr SO ₂ ¹ – 0.171 g/hp-hr
Engine PM ₁₀ emissions	AQ-54	0.13 g/hp-hr	0.029 g/hp/hr

¹ When the original Determination of Compliance was issued for the Henrietta Peaker Project, it was SJVAPCD Central Zone practice to only specify emission limits for NO_x and PM₁₀. The SJVAPCD Central zone practice is to now specify emission limits for all criteria pollutants. For that reason, the proposed limits include emission limits for CO, VOC and SO₂.

The applicable emission limits in the CEC Conditions of Certification are all expressed in units of grams per horsepower-hour (g/hp-hr) instead of pounds per hour (lb/hr). Maximum pound per hour emission rates are determined by multiplying the generator maximum horsepower rating by the emission limit expressed in g/hp-hr and dividing by 454 g/lb. Because the proposed substitute emergency generator will be a slightly larger in size than the emergency generator originally proposed, the maximum hourly emission rate for NO_x would

increase by approximately 0.6 lb/hr, from a maximum of 4.29 lb/hr to a maximum of 4.87 lb/hr. The maximum hourly emission of SO₂ would also increase from a maximum of 0.137 lb/hr to a maximum of 0.158 lb/hr (assuming 0.05% maximum sulfur fuel). It is important to note that unless there is an emergency event at the power plant, the emergency generator will normally only operate approximately 15 minutes per week for reliability testing and scheduled maintenance. Therefore, the potential NO_x and SO₂ emission increases will be 25% of the aforementioned values during normal operation. The maximum hourly emissions of CO, VOC and PM₁₀ will all decrease, despite the larger size of the substitute emergency generator.

Although the maximum hourly emissions of NO_x and SO₂ from the emergency generator will increase very slightly, GWF is committed to maintaining compliance with all existing daily and annual emission limits for the facility. Accordingly, there will be no increase in maximum NO_x or SO₂ emissions from the facility on either a daily or an annual basis. Based on this commitment and the requirements of the existing conditions, there is no need to modify the previously provided facility mitigation.

(B) A discussion of the necessity for the proposed modifications

This modification is needed in order to establish consistency with the SJVAPCD modified Authority to Construct and to accurately reflect the emergency generator that is installed

(C) If the modification is based on information that was known by the petitioner during the certification proceeding, an explanation why the issue was not raised at that time

This modification petition is not based on information that was known by the petitioner at the time of the certification proceeding. The request is based on information that has become available to GWF as a result the final inspection of the constructed facility by SJVAPCD. At that time, it was discovered that Black & Veatch (B&V), the constructor of the power plant, had installed a 300 kW emergency generator with a “cleaner” ARB Certified Clean Diesel

engine in lieu of the 250 kW generator originally requested and specified by GWF Energy LLC because the 250 kW generator was not available on a timeline that was consistent with the project's contractual deadline with the State of California. B&V installed the proposed 300 kW emergency generator because it had superior emissions performance, a faster delivery schedule and would continue to be limited to operate less than 250 kW (since the connected total emergency electrical load for the power plant is less than 250 kW). It is important to note that the "connected" emergency load has not changed. At the time of discovery, SJVAPCD requested that GWF submit an application for Authority to Construct to amend the model number designation and to correct the emission characteristics of the emergency generator. Subsequently, an application was submitted to the SJVPACD. SJVAPCD publicly noticed its intent to approve the proposed change on September 4, 2003. A similar request is now being submitted to the CEC.

(D) If the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, an explanation of why the change should be permitted

This modification petition is general consistent with the existing evidentiary record regarding annual emissions impacts, and mitigation (offsets) and does not undermine any of the rationale, findings or other bases of the final decision. The proposed change would result in a 300 kW larger emergency generator that would have slightly different physical exhaust parameters. While the emergency generator would be limited to operating less than 200 hours per year, in order to ensure that the emissions would not cause any significant air quality or public health impacts, the SJVAPCD completed an air quality impact analysis and public health risk screening of the proposed substitute emergency generator. The SJVAPCD analysis demonstrates that proposed emergency generator will comply with all applicable laws, ordinances, regulations and standards and there is no potential for the proposed emergency generator change to exceed any PSD significance threshold, any applicable AAQS or SJVAPCD public health risk screening thresholds. Since daily and annual emission rate limits for the facility will remain unchanged, there is no change in the facility's long term emissions profile that would require a change in the amount of emission offsets that have already been surrendered to ensure there is no significant air quality impact.

Accordingly, the proposed change will have no significant impact on air quality or public health.

(E) *An analysis of the impacts the modification may have on the environment and proposed measures to mitigate any significant adverse impacts*

A complete analysis of the proposed changes completed by the SJVAPCD has shown that there are no significant impacts to the environment from the proposed change. Since the proposed change will no increase allowable daily or annual emissions from the facility, no additional air quality mitigation is needed.

(F) *A discussion of the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards*

The proposed changes will comply with all applicable laws, ordinances, regulations and standards as demonstrated by the attached SJVAPCD analysis and proposed Authority to Construct (Appendix B)

(G) *A discussion of how the modification affects the public*

The proposed revisions will have a no significant impact on the public. The proposed amendments will implement a minor change to the size of an emergency generator that will be rarely operated. In addition, a publicly noticed and reviewed analysis by the SJVAPCD staff has demonstrated that the proposed change will have no significant impact on the public.

(H) *A list of property owners potentially affected by the modification*

There are no property owners that will be affected by the proposed modification. The property owner's list previously made a part of the evidentiary record is current, and is attached (See Appendix C).

(I) A discussion of the potential effect on near by property owners, the public and the parties in the application proceedings

The proposed revisions will have a no significant impact on near by property owners. The proposed amendments will implement a minor change to the size of an emergency generator that will be rarely operated. In addition, a publicly noticed and reviewed analysis by the SJVAPCD has demonstrated that the proposed change will have no significant impact on near by property owners.

3.0 SCHEDULE

The SJVAPCD proposed approval of the Authority to Construct for the requested change on September 4, 2003. A 30-day public comment period is pending, no adverse public comments have been received, however, GWF will promptly notify the CEC of any changes to the SJVAPCD draft. The SJVAPCD is expected to issue a final Authority to Construct on or about October 4, 2003 (close of the public comment period). A copy of the draft Authority to Construct is included in Appendix B and a copy of the final Authority to Construct will be provided to the CEC as soon as it is available from the District. We respectfully request that the CEC incorporate these changes in the license as expeditiously as is possible.

4.0 SUMMARY

This minor amendment will only affect air quality impacts. There are no changes to any other environmental impact area. The effect of the proposed changes is to allow a slightly larger, lower emitting emergency generator to be used instead of the emergency generator originally proposed. The analysis that has already been performed by CEC staff and reviewed by the CEC prior to approving the license is not undermined or negatively impacted as a result of the proposed changes. SJVAPCD has reviewed the proposed change and has publicly noticed its intent to approve the project on or about October 4, 2003. The proposed

will not significantly impact air quality or public health and will not jeopardize the HPP's ability to comply with all applicable laws, ordinances, regulations and standards.

APPENDIX A

PROPOSED CHANGES TO CONDITIONS OF CERTIFICATION

Proposed Revisions to Conditions of Certification

(Additions in **boldface**, deletions in ~~strikeout~~)

1. Revise the equipment description preceding condition AQ-47 as follows:

SJVAPCD Permit No. UNIT C-3929-~~43~~-0 – ~~471382~~ HP CATAPILLER MODEL **3456** ~~3306~~
DIESEL-FIRED EMERGENCY IC ENGINE POWERING A **300** ~~250~~ KW ELECTRICAL
GENERATOR.

2. Revise Condition AQ-53 as follows:

AQ-53 NO_x, CO, VOC and SO₂ emissions shall not exceed **4.69** ~~5.09~~ g/hp-hr, 0.12
g/hp-hr, 0.04 g/hp-hr and 0.171 g/hp-hr, respectively. [District Rule 2201]

Verification: The project owner/operator shall provide records of
compliance for the above condition as part of the quarterly reports of Condition
AQ-49.

3. Revise Condition AQ-54 as follows:

AQ-54 PM₁₀ emissions shall not exceed **0.029** ~~0.43~~ g/bhp-hr **based on US EPA
certification using ISO 8178 test procedure**. [District Rules 2201]

Verification: The project owner/operator shall provide records of
compliance for the above condition as part of the quarterly reports of Condition
AQ-49.

APPENDIX B

**SJVAPCD ENGINEERING ANALYSIS AND PROPOSED AUTHORITY TO
CONSTRUCT**

Authority to Construct Application Review Diesel-Fired Emergency IC Engine

Facility Name:	GWF Energy LLC – Henrietta Peaker	Date:	August 18, 2003
Mailing Address:	4300 Railroad Ave. Pittsburg, CA 94565-6006	Engineer:	Derek Fukuda
Contact Person:	Mark Kehoe	Lead Engineer:	Errol Villegas
Telephone:	(925) 431-1440		
Application #:	C-3929-4-0		
Project #:	1031435		
Complete:	August 18, 2003		

I. Proposal

GWF Energy LLC – Henrietta Peaker is proposing to install a diesel-fired emergency internal combustion (IC) engine powering an electrical generator. The GWF Energy LLC - Henrietta Peaker Determination of Compliance Evaluation originally permitted the Authority to Construct (ATC) of a 382 hp Caterpillar Model #3306 diesel-fired emergency IC engine to power an electrical generator. At the time of construction this model engine was not readily available, therefore a 471 hp Caterpillar Model #3456 DI TA AA was installed in its place. The permitted engine (ATC #C-3929-3-0) was never installed. For this project, ATC #C-3929-4-0 will supercede ATC #C-3929-3-0.

Appendix C: ATC #C-3929-3-0

II. Applicable Rules

Rule 2201	New and Modified Stationary Source Review Rule (12/19/02)
Rule 2520	Federally Mandated Operating Permits (6/21/01)
Rule 4101	Visible Emissions (11/15/01)
Rule 4102	Nuisance (12/17/92)
Rule 4201	Particulate Matter Concentration (12/17/92)
Rule 4701	Stationary Internal Combustion Engines (11/12/98)
Rule 4801	Sulfur Compounds (12/17/92)
CH&SC	42301.6

III. Project Location

The equipment will be operated at 16027 25th Ave. in Lemoore, CA. The applicant states that the equipment is not located within 1,000 feet of a K-12 school.

IV. Process Description

The emergency engine powers an electrical generator. Other than emergency operation, the engine may be operated up to 200 hours per year for maintenance and testing purposes.

V. Equipment Listing

C-3929-4-0: 471 hp Caterpillar Model #3456 DI TA AA diesel-fired emergency IC engine powering an electrical generator.

VI. Emission Control Technology Evaluation

The engine is equipped with:

- Turbocharger
- Intercooler/aftercooler
- Injection timing retard (or equivalent per District Policy SSP 1805)
- Positive Crankcase Ventilation (PCV) or 90% efficient control device
- This engine is required to be, and is UL certified
- Catalytic particulate filter
- Low (0.05%) sulfur diesel

The emission control devices/technologies and their effect on diesel engine emissions detailed below are from *Non-catalytic NO_x Control of Stationary Diesel Engines*, by Don Koeberlein, CARB.

The turbocharger reduces the NO_x emission rate from the engine by approximately 10% by increasing the efficiency and promoting more complete burning of the fuel.

The intercooler/aftercooler functions in conjunction with the turbocharger to reduce the inlet air temperature. By reducing the inlet air temperature, the peak combustion temperature is lowered, which reduces the formation of thermal NO_x. NO_x emissions are reduced by approximately 15% with this control technology.

The PCV system reduces crankcase VOC and PM₁₀ emissions by at least 90% over an uncontrolled crankcase vent.

The use of low sulfur (0.05% by weight sulfur maximum) diesel fuel reduces SO_x emissions by approximately 90% from standard diesel fuel.

VII. General Calculations

A. Assumptions

Emergency operating schedule:	24 hours/day
Non-emergency operating schedule:	200 hours/year
Density of diesel fuel:	7.1 lb/gal
EPA F-factor (adjusted to 60°F):	9,051 dscf/MMBtu
Fuel heating value:	137,000 Btu/gal
BHP to Btu/hr conversion:	2,542.5 Btu/hp-hr
Thermal efficiency of engine:	commonly ≈ 35%

B. Emission Factors

IC Engine Emission Factors		Source
NO _x	4.69 g/hp-hr	Engine Manufacturer
SO _x	0.171 g/hp-hr	Mass Balance Equation Below
PM ₁₀	0.029 g/hp-hr	Engine Manufacturer
CO	0.12 g/hp-hr	Engine Manufacturer
VOC	0.04 g/hp-hr	Engine Manufacturer

$$0.05\% \text{ S} \times \frac{7.1 \text{ lb} \cdot \text{fuel}}{\text{gallon}} \times \frac{2 \text{ lb} \cdot \text{SO}_2}{1 \text{ lb} \cdot \text{S}} \times \frac{1 \text{ gal}}{137,000 \text{ Btu}} \times \frac{1 \text{ hp input}}{0.35 \text{ hp out}} \times \frac{2,542.5 \text{ Btu}}{\text{hp} \cdot \text{hr}} \times \frac{453.6 \text{ g}}{\text{lb}} = 0.171 \frac{\text{g} \cdot \text{SO}_x}{\text{hp} \cdot \text{hr}}$$

C. Calculations

1. Pre-Project Emissions (PE₁)

Since this is a new emissions unit, PE₁=0.

2. Post Project PE (PE₂)

The daily, annual and quarterly PE are calculated as follows:

Daily Emissions								
NO _x	4.69	(g/hp-hr) x	471	(hp) x	24	(hr/day) ÷ 453.6 (g/lb) =	183.9	(lb/day)
SO _x	0.171	(g/hp-hr) x	471	(hp) x	24	(hr/day) ÷ 453.6 (g/lb) =	6.7	(lb/day)
PM ₁₀	0.029	(g/hp-hr) x	471	(hp) x	24	(hr/day) ÷ 453.6 (g/lb) =	1.1	(lb/day)
CO	0.12	(g/hp-hr) x	471	(hp) x	24	(hr/day) ÷ 453.6 (g/lb) =	4.7	(lb/day)
VOC	0.04	(g/hp-hr) x	471	(hp) x	24	(hr/day) ÷ 453.6 (g/lb) =	1.6	(lb/day)

Annual Emissions								
NO _x	4.69	(g/hp-hr) x	471	(hp) x	200	(hr/yr) ÷ 453.6 (g/lb) =	1,532	(lb/yr)
SO _x	0.171	(g/hp-hr) x	471	(hp) x	200	(hr/yr) ÷ 453.6 (g/lb) =	56	(lb/yr)
PM ₁₀	0.029	(g/hp-hr) x	471	(hp) x	200	(hr/yr) ÷ 453.6 (g/lb) =	9	(lb/yr)
CO	0.12	(g/hp-hr) x	471	(hp) x	200	(hr/yr) ÷ 453.6 (g/lb) =	39	(lb/yr)
VOC	0.04	(g/hp-hr) x	471	(hp) x	200	(hr/yr) ÷ 453.6 (g/lb) =	13	(lb/yr)

Quarterly Emissions								
NO _x	4.69	(g/hp-hr) x	471	(hp) x	50	(hr/qtr) ÷ 453.6 (g/lb) =	383	(lb/qtr)
SO _x	0.171	(g/hp-hr) x	471	(hp) x	50	(hr/qtr) ÷ 453.6 (g/lb) =	14	(lb/qtr)
PM ₁₀	0.029	(g/hp-hr) x	471	(hp) x	50	(hr/qtr) ÷ 453.6 (g/lb) =	2	(lb/qtr)
CO	0.12	(g/hp-hr) x	471	(hp) x	50	(hr/qtr) ÷ 453.6 (g/lb) =	10	(lb/qtr)
VOC	0.04	(g/hp-hr) x	471	(hp) x	50	(hr/qtr) ÷ 453.6 (g/lb) =	3	(lb/qtr)

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

Pursuant to Section 4.9 of District Rule 2201, the Pre-Project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid 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.

Since this is an existing facility, SSPE1 is equal to the $PE1_{\text{Total Pre-Project}}$ for all criteria pollutants.

SSPE1					
Permit Unit	NO _x (lb/yr)	SO _x (lb/yr)	PM ₁₀ (lb/yr)	CO (lb/yr)	VOC (lb/yr)
PTO -1-2, gas turbine	49,510	2,640	16,000	21,830	2,844
PTO -2-2, gas turbine	49,510	2,640	16,000	21,830	2,844
ATC -3-0, emergency IC engine	891	30	23	198	25
SSPE1 Total	99,911	5,310	32,023	43,858	5,713

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

Pursuant to Section 4.10 of District Rule 2201, the Post-project Stationary Source Potential to Emit (SSPE2) is the Potential to Emit (PE) from all units with valid 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.

Since this is a modification to an existing facility, SSPE2 is equal to the $PE2_{\text{Total Post-Project}}$ for all criteria pollutants.

For this project the change in emissions for the facility is due to the cancellation of unit -3-0, and the addition of unit -4-0. Thus:

SSPE2					
Permit Unit	NO _x (lb/yr)	SO _x (lb/yr)	PM ₁₀ (lb/yr)	CO (lb/yr)	VOC (lb/yr)
PTO -1-2, gas turbine	49,510	2,640	16,000	21,830	2,844
PTO -2-2, gas turbine	49,510	2,640	16,000	21,830	2,844
ATC -4-0, emergency IC engine	1,532	56	9	39	13
SSPE2 Total	100,552	5,336	32,009	43,699	5,701

5. Major Source Determination

A Major Source is a source with an SSPE2 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 in order 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.

Pollutant	SSPE1	SSPE2	Major Source Threshold	Existing Major Source?	Becoming a Major Source?
NO _x	99,911 lb/year	100,552 lb/year	50,000 lb/year	Yes	No
SO _x	5,310 lb/year	5,336 lb/year	140,000 lb/year	No	No
PM ₁₀	32,023 lb/year	32,009 lb/year	140,000 lb/year	No	No
CO	43,858 lb/year	43,699 lb/year	200,000 lb/year	No	No
VOC	5,713 lb/year	5,701 lb/year	50,000 lb/year	No	No

6. Baseline Emissions (BE)

a. Annual BE

The annual BE is performed pollutant by pollutant for every unit in the project to determine the amount of offsets required, where necessary, when the SSPE1 is greater than the offset threshold. Since this is a new emergency IC engine which is not subject to offsets pursuant to District Rule 2201, the annual BE calculation is not necessary.

b. Quarterly BE (QBE)

The QBE is required on a pollutant by pollutant basis to determine the Quarterly Net Emissions Change below.

Since this is a new IC engine, the QBE is zero for all pollutants.

QBE lb/qtr	
NO _x	0
SO _x	0
PM ₁₀	0
CO	0
VOC	0

7. Quarterly Net Emissions Change (QNEC)

The QNEC is entered into PAS database and subsequently reported to CARB. For seasonal sources, or where the emissions differ quarter to quarter, then evaluate each pollutant for each quarter separately. The QNEC is calculated for each pollutant, for each unit, as the difference between the post-project quarterly permitted emissions and the quarterly baseline emissions.

Quarterly NEC (for continuous sources)			
	PE ₂ lb/qtr	BE lb/qtr	NEC lb/qtr
NO _x	383	0	383
SO _x	14	0	14
PM ₁₀	2	0	2
CO	10	0	10
VOC	3	0	3

8. Title I Modification

Major Modification CIPE Thresholds	
POLLUTANT	CIPE (POUNDS PER YEAR)
VOC	50,000
NO _x	50,000
CO	100,000
PM10	30,000
SO _x	30,000

Section 3.39 of District Rule 2201 defines a Title I Modification as “the same as a Major Modification.” District Policy APR 1125 defines a Major Modification as “*any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act.*” The policy further defines a net emissions increase as “(1) any increase in actual emissions from a particular physical change or change in the method of operation at a stationary source; and (2) Any increases and decreases in actual emissions at the source that are contemporaneous with the particular change and are otherwise creditable.”

Calculating the CIPE is required for existing Major Sources to determine if the current project will increase emissions above Title I Modification thresholds or is required for existing non-Major Sources to determine if the current project will increase emissions above Major Source thresholds. As discussed in Section VII.C.5 above, the facility is a Major Source for NO_x emissions. Since the increases in emissions from the project are not equal to or greater than the Major Modification CIPE Threshold, Title I Modification calculations are not necessary.

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 two pounds per day,
- b) The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day, and/or
- c) Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day.
- d) The pollutants for which a Title I Modification has been triggered.

*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:

BACT Applicability				
Pollutant	Daily Emissions	BACT Threshold	SSPE2	BACT Triggered
NO _x	183.9 lb/day	2 lb/day	n/a	Yes
SO _x	6.7 lb/day	2 lb/day	n/a	Yes
PM ₁₀	1.1 lb/day	2 lb/day	n/a	No
CO	4.7 lb/day	2 lb/day and SSPE2 ≥ 200,000 lb/yr	43,699 lb/yr	No
VOC	1.6 lb/day	2 lb/day	n/a	No

BACT Guideline 3.1.3, 3rd quarter 2003, which appears in Appendix A of this report, covers diesel-fired emergency IC engines of greater than 400 horsepower.

2. BACT Analysis

Pursuant to the BACT Analysis which appears in Appendix A of this report, BACT is satisfied with:

Certified NO_x emissions of 6.9 g/hp·hr or less.

The use of low sulfur fuel (0.05% sulfur by weight) or very low sulfur fuel where available

B. Offsets

Since emergency IC engines are exempt from the offset requirements of Rule 2201, offsets are not required for this engine, and no further offset calculations are required.

C. Public Notification

Public noticing is required for:

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

1. Applicability

a. Major Source

A new Major Source is a new facility which is also a major source.

Based upon the determination in Section VII.C.5 above, this facility is not a new major source. Therefore, public notification is not required for new major source purposes.

b. Title I Modification

Based on the data presented and discussed in Section VII.C.8 above, Title I Modification is not triggered as the result of this project. Therefore, public noticing is not required for Title I Modification purposes.

c. Offset Threshold

The following table compares the pre-project SSPE with the post-project SSPE in order to determine if any offset thresholds have been surpassed.

Pollutant	SSPE1	SSPE2	Offset Threshold	Public Notice Required?
NO _x	99,911 lb/year	100,552 lb/year	20,000 lb/yr	No
SO _x	5,310 lb/year	5,336 lb/year	54,750 lb/yr	No
PM ₁₀	32,023 lb/year	32,009 lb/year	29,200 lb/yr	No
CO	43,858 lb/year	43,699 lb/year	200,000 lb/yr	No
VOC	5,713 lb/year	5,701 lb/year	20,000 lb/yr	No

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

d. PE > 100 lb/day

The Daily PE for this new unit is compared to the daily PE Public Notice Thresholds in the following table:

Pollutant	Daily PE	Public Notice Threshold	Public Notice Triggered?
NO _x	183.9 lb/day	100 lb/day	Yes
SO _x	6.7 lb/day	100 lb/day	No
PM ₁₀	1.1 lb/day	100 lb/day	No
CO	4.7 lb/day	100 lb/day	No
VOC	1.6 lb/day	100 lb/day	No

Therefore, public noticing is required for daily emissions.

e. SSIPE > 20,000 lb/year

An SSIPE exceeding 20,000 pounds per year for any one pollutant triggers public notice.

The values for SSPE2 and SSPE1 are calculated according to Rule 2201, Sections 4.9 and 4.10, respectively, where SSIPE = SSPE2 - SSPE1. When calculating SSPE2, it is important to only include reductions occurring as part of the Stationary Source project and not unrelated reductions that could occur at a later date or not at all.

Public noticing is required if the SSIPE exceeds 20,000 lb/year for any pollutant. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table:

SSIPE Public Notice Thresholds					
Pollutant	SSPE2 lb/year	SSPE1 lb/year	SSIPE lb/year	Public Notice Threshold lb/year	Public Notice Triggered?
NO _x	100,552	99,911	641	20,000	No
SO _x	5,336	5,310	26	20,000	No
PM ₁₀	32,009	32,023	(-14)	20,000	No
CO	43,699	43,858	(-159)	20,000	No
VOC	5,701	5,713	(-12)	20,000	No

Therefore public noticing is not required for SSIPE purposes.

2. Public Notice Action

As discussed above, public noticing is required for this project.

Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and United States Environmental Protection Agency (US EPA), and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATC for this engine.

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. No further conditions are required.

E. Compliance Assurance

1. Source Testing

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

2. Monitoring

No monitoring is required to demonstrate compliance with Rule 2201.

3. Record Keeping

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201. The following condition will appear on the permit to operate:

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 sulfur content of the diesel 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.

4. Reporting

No reporting is required for emergency IC engines.

Rule 2520 Federally Mandated Operating Permits

Since this facility's emissions exceed the major source thresholds of Rule 2201, this facility is a major source. Pursuant to Rule 2520 Section 5.1, and as required by permit condition, the facility will have up to 12 months from the date of ATC issuance to either submit a Title V Application or comply with District Rule 2530 *Federally Enforceable Potential to Emit*.

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.

Therefore pursuant to the District's Risk Management Policy for Permitting New and Modified Sources (APR 1905, 3/2/01), a risk management review has been performed for this project to analyze the impact of toxic emissions. For projects where the increase in cancer risk is greater than one per million, Toxic Best Available Control Technology (T-BACT) is required.

The cancer risk for this project is shown below (see the HRA Summary in Appendix B):

HRA Results		
Unit	Cancer Risk	T-BACT Required
C-3929-4-0	0.18 per million	No

The proposed emergency engine, at 0.029 g/hp-hr based on U.S. EPA Certification tests using the ISO 8178 D2 test procedure, and CARB certified diesel fuel, meets T-BACT requirements as defined in District Policy APR 1910 (3/02/01).

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification project not pose a significant health risk (a cancer risk of greater than 10 per million). The cancer risk associated with this project does not exceed 10 per million.

The following permit conditions are required to assure compliance with the assumptions made for the risk management review:

1. Only CARB certified diesel fuel containing not more than 0.05% sulfur is to be used.
2. The PM₁₀ emissions rate shall not exceed 0.029 g/hp-hr based on US EPA certification using ISO 8178 test procedure.
3. The exhaust stack shall not be fitted with a rain cap, or any similar device, that would impede vertical exhaust flow.
4. The engine shall be operated only for maintenance, testing, required regulatory purposes and during emergency situations. Operation of the engine for maintenance, testing and required regulatory purposes shall not exceed 200 hours per year.
5. For maintenance, testing, and required regulatory purposes, the emergency engine shall not be operated for more than 37 minutes in any one-hour period.

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:

$$0.029 \frac{g}{hp \cdot hr} \times \frac{1 hp \cdot hr}{2,542.5 Btu} \times \frac{10^6 Btu}{9,051 dscf} \times \frac{0.35 Btu_{out}}{1 Btu_{in}} \times \frac{15.43 grain}{g} = 0.007 \frac{grain}{dscf}$$

Since 0.007 $\frac{grain}{dscf}$ is \leq to 0.1 grain per dscf, compliance with Rule 4201 is expected.

Rule 4701 Stationary Internal Combustion Engines

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 further recordkeeping is required for this rule.

Rule 4801 Sulfur Compounds

Rule 4801 requires that sulfur compound emissions (as SO₂) shall not exceed 0.2% by volume. Using the ideal gas equation, the sulfur compound emissions are calculated as follows:

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

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

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

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

$$0.05\% \quad \% S \times \frac{7.1 \text{ lb}}{\text{gal}} \times \frac{64 \text{ lb} \cdot \text{SO}_2}{32 \text{ lb} \cdot S} \times \frac{1 \text{ MMBtu}}{9,051 \text{ scf}} \times \frac{1 \text{ gal}}{0.137 \text{ MMBtu}} \times \frac{\text{lb} \cdot \text{mol}}{64 \text{ lb} \cdot \text{SO}_2} \times \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot ^\circ \text{R}} \times \frac{520^\circ \text{R}}{14.7 \text{ psi}} = 33.5 \text{ ppmv}$$

Since 33.5 ppmv is \leq 2000 ppmv, this engine is expected to comply with Rule 4801.

California Health & Safety Code 42301.6 (School Notice)

The applicant has indicated 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

Pending successful NSR Public Noticing period, issue ATC C-3929-4-0 subject to the permit conditions listed on the attached draft Authority to Construct.

X. Billing Information

Permit Number	Fee Schedule	Fee Description
C-3929-4-0	3020-10-D	471 hp IC Engine

List of Appendixes

- A. BACT Guideline and BACT Analysis
- B. HRA Summary
- C. ATC #C-3929-3-0
- D. Draft ATC

Appendix A

Best Available Control Technology (BACT) Guideline 3.1.3*

Last Update: June 30, 2001

Emission Unit: Emergency Diesel I.C. Engine \geq 400 hp

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Positive crankcase ventilation		
CO	2.0 grams/brake horsepower-hour	\leq 1.4 grams/bhp-hr	
SO _x	Low-sulfur diesel fuel (500 ppmw sulfur or less) or Very Low-sulfur diesel fuel (15 ppmw sulfur or less), where available.		
NO _x	Certified emissions of 6.9 g/bhp-hr or less		
PM ₁₀	0.1 grams/bhp-hr (if TBACT is triggered) 0.4 grams/bhp-hr (if TBACT is not triggered)		

1. Any engine model included in the ARB or EPA diesel engine certification lists and identified as having a PM10 emission rate of 0.149 grams/bhp-hr or less, based on ISO 8178 test procedure, shall be deemed to meet the 0.1 grams/bhp-hr requirement.
2. A site-specific Health Risk Analysis is used to determine if TBACT is triggered. (Clarification added 05/07/01)

BACT Analysis

BACT Analysis for NO_x Emissions:

Oxides of nitrogen (NO_x) are generated from the high temperature combustion of the diesel fuel. A majority of the NO_x emissions are formed from the high temperature reaction of nitrogen and oxygen in the inlet air. The rest of the NO_x emissions are formed from the reaction of fuel-bound nitrogen with oxygen in the inlet air.

a. Step 1 - Identify All Possible NO_x Control Technologies

The SJVUAPCD BACT Clearinghouse identifies achieved-in-practice BACT for this engine as certified NO_x emissions of 6.9 g/hp-hr or less. No technologically feasible alternatives are listed.

b. Step 2 - Eliminate Technologically Infeasible Options

There are no technologically feasible options listed.

c. Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Certified NO_x emissions of 6.9 g/hp-hr or less.

d. Step 4 - Cost Effectiveness Analysis

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

e. Step 5 - Select BACT

Therefore, BACT for NO_x emissions is certified NO_x emissions of less than 6.9 g/hp-hr.

BACT Analysis for SO_x Emissions:

Oxides of sulfur (SO_x) emissions occur from the combustion of the sulfur which is present in the diesel fuel.

a. Step 1 - Identify All Possible Control Technologies

The SJVUAPCD BACT Clearinghouse Guideline identifies achieved-in-practice BACT for this engine as low-sulfur fuel (0.05% by weight) or very low-sulfur fuel (0.0015% by weight) where available.

b. Step 2 - Eliminate Technologically Infeasible Options

There are no technologically feasible options.

c. Step 3 - Rank Remaining Control Technologies by Control Effectiveness

low-sulfur fuel or very low-sulfur fuel

d. Step 4 - Cost Effectiveness Analysis

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

e. Step 5 - Select BACT

BACT for SO_x emissions for this engine is the use of fuel with a sulfur content of 0.05% or 0.0015% where available.

Appendix B

HRA Summary

Appendix C
ATC #C-3929-3-0

Appendix D Draft ATC

San Joaquin Valley Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT

PERMIT NO: C-3929-4-0

LEGAL OWNER OR OPERATOR: GWF ENERGY LLC - HENRIETTA
MAILING ADDRESS: 4300 RAILROAD AVE
PITTSBURG, CA 94565

LOCATION: 25TH AVE
LEMOORE, CA

EQUIPMENT DESCRIPTION:
471 HP CATERPILLAR MODEL #3456 DI TA AA DIESEL-FIRED EMERGENCY IC ENGINE POWERING AN ELECTRICAL GENERATOR

CONDITIONS

1. This Authority to Construct (ATC) shall supercede ATC #C-3929-3-0. [District Rule 2201]
2. {1897} This engine shall be equipped with either a positive crankcase ventilation (PCV) system that recirculates crankcase emissions into the air intake system for combustion, or a crankcase emissions control device of at least 90% control efficiency. [District Rule 2201]
3. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap, roof overhang, or any other obstruction. [District Rule 4102]
4. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
5. {1344} The engine shall be operated only for maintenance, testing, and required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 200 hours per year. [District NSR Rule and District Rule 4701]
6. For maintenance, testing, and required regulatory purposes, the emergency engine shall not be operated for more than 37 minutes in any one-hour period. [District Rule 4102]
7. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
8. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
9. {1902} The sulfur content of the diesel fuel used shall not exceed 0.05% by weight. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 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.

DAVID L. CROW, Executive Director, APCO

SEYED SADREGH, Director of Permit Services

03-2029-4-0; Sup # 2010 3-29M - Public Draft - Just inspection NOT Required

Central Regional Office • 1990 E. Gettysburg Ave. • Fresno, CA 93726 • (559) 230-5900 • Fax (559) 230-8081

Conditions for C-3929-4-0 (continued)

Page 2 of 2

10. Emissions from this engine shall not exceed any of the following limits: 4.69 g-NOx/hp-hr, 0.12 g-CO/hp-hr, 0.04 g-VOC/hp-hr, or 0.171 g-SOx/hp-hr. [District Rule 2201]
11. The PM10 emissions rate shall not exceed 0.029 g/hp-hr based on US EPA certification using ISO 8178 test procedure. [District Rule 2201]
12. {2247} 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 sulfur content of the diesel 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 Rule 1070]

DRAFT

CL300471 Rev 4 2007 3 40PM - PLW/BAO

APPENDIX C

PROPERTY OWNERS LIST

**Property Owners within 1,000 Feet of the GWF Henrietta Peaker Project and within
500 Feet of Associated Linear Facilities**

Assessor's Parcel No.	Property Owner	Address
024-190-065 APN for project site TBD	John D. & Sally L. Oliveira	8519 24 th Avenue Lemoore, CA 93245
024-190-002	Pacific Gas & Electric	One Market, Spear Tower, Suite 2400 San Francisco, CA 94105
024-190-023	John D. & Sally L. Oliveira	8519 24 th Avenue Lemoore, CA 93245
024-190-066	John D. & Sally L. Oliveira	8519 24 th Avenue Lemoore, CA 93245
024-190-069	Newstar Fresh Foods LLC	126 Sun Street Salinas, CA 93901
024-260-004	Nancy L. Oliveira Revocable Trust	9235 24 th Avenue Lemoore, CA 93245
024-260-018	John D. & Sally L. Oliveira	8519 24 th Avenue Lemoore, CA 93245
024-270-006	Nancy L. Oliveira Revocable Trust	9235 24 th Avenue Lemoore, CA 93245
024-270-007	Nancy L. Oliveira Revocable Trust	9235 24 th Avenue Lemoore, CA 93245
024-270-008	Nancy L. Oliveira Revocable Trust	9235 24 th Avenue Lemoore, CA 93245
024-270-009	Jack R. Clinton, et al	1718 Marion Drive Glendale, CA 91205
024-270-010	Nancy L. Oliveira Revocable Trust	9235 24 th Avenue Lemoore, CA 93245
024-270-011	Robert & Eleanor M Sawyer	Star Rt, 1 Box 273 Posey, CA 93260
024-270-012	Dr. Seymour, et al	716 N. Palm Drive Beverly Hills, CA 90212
024-270-013	Helen J. Carey	2 Isabella Avenue Atherton, CA 94027
024-270-014	Arthur B. Moss	37586 Medjool Avenue Palm Desert, CA 92211
024-270-015	Nancy L. Oliveira Revocable Trust	9235 24 th Avenue Lemoore, CA 93245
024-270-016	Nancy L. Oliveira Revocable Trust	9235 24 th Avenue Lemoore, CA 93245
026-001-038	West Grand Partners	724 S. Lemoore Avenue Lemoore, CA 93245

Assessor's Parcel No.	Property Owner	Address
026-001-041	John D. & Sally L. Oliveira	8519 24 th Avenue Lemoore, CA 93245
026-001-042	West Grand Partners	724 S. Lemoore Avenue Lemoore, CA 93245
026-020-010	Rancho Naranja	23311 Newton Avenue Stratford, CA 93266
026-020-015	John D. & Sally L. Oliveira	8519 24 th Avenue Lemoore, CA 93245
026-020-016	K J C Farms	23311 Newton Avenue Stratford, CA 93266

San Joaquin Valley Unified Air Pollution Control District

MEMORANDUM

DATE: July 2, 2003

TO: Nick Peirce, AQE—Permit Services

FROM: Kathi Crump, AQS—Technical Services

SUBJECT: AAQA and RMR Modeling Results for GWF Energy (N-4597-4-0)

As per your request, Technical Service performed a RMR and Ambient Air Quality Analysis on a 471 hp Caterpillar Model 3456 DI TA AA diesel-fired emergency IC engine powering a 300kW electrical generator.

RMR Modeling

Pollutant dispersion was determined from ISCST3 using the stack parameters provided by the engineer and building down-wash and meteorological data for Tracy 1998 supplied by the applicant. The results below reflect the worse case cancer risk.

Device	Emergency IC Engine
Acute Index	N/A
Chronic Index	N/A
Cancer Risk (per million)	0.3
TBACT Required?	No

The carcinogenic risk of 0.3 in a million was below the 10.0 in a million limit for diesel IC engines emitting $\leq 0.149\text{g PM}_{10}/\text{bhp}/\text{hr}$. **The project is approved, and TBACT is not required.** The following permit conditions are required to ensure compliance with the assumptions made for the risk management review:

1. Only CARB certified fuel containing not more than 0.05% sulfur by weight is to be used in this engine.
2. PM₁₀ emission rate shall not exceed **0.029 g/HP-hr (note method)**.
3. The exhaust stack shall not be fitted with a rain cap, or any other similar device, that impedes upward vertical exhaust flow.

- The engine shall only be operated for maintenance, testing, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance and testing purposes shall not exceed **200 hours per year**.

AAQA

For the Ambient Air Quality Analysis, the engineer supplied the emission rates for each criteria pollutant on an hourly and annual basis. Background concentrations for the pollutants were drawn from EPA data for San Joaquin Co 2002 and Kern County (2001 for SO_x).

The results from Criteria Pollutant Modeling are as follows:

AAQA Results*

Device – 4-0 Emergency ICE	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**

*See the attached PSD spreadsheet for pollutant concentrations.

**The PM₁₀ emissions for this project are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2).

X = Not a designated averaging time for this pollutant.

Conclusion

The AAQA indicates that the emissions from the emergency diesel IC engine will not have an adverse impact on the State or National AAQS. Therefore, no further modeling will be required and permitting may proceed as proposed.