TECHNICAL REVIEW: AIR PERMIT BY RULE

Permit No.:	47023	***Company Name:***	Hilcorp Energy Company	***APD Reviewer:***	Mr. Clyde Price
Project No.:	148827	***Unit Name:***	Federal Gayette Lease Tank Battery	***PBR No(s).:***	106.352 and 106.512

GENERAL INFORMATION			
Regulated Entity No.:	RN102527579	**Project Type:**	Permit by Rule Application
Customer Reference No.:	CN600125991	**Date Received by TCEQ:**	July 7, 2009
Account No.:	GB-0577-F	**Date Received by Reviewer:**	July 15, 2009
City/County:	Alta Loma, Galveston County	**Physical Location:**	From Highway 6 in Alta Loma, travel east for approximately 1.5 miles and turn left on Jack Brooks Road. Travel north on Jack Brooks Road approximately 1.5 miles to facility on left.

CONTACT INFORMATION					
Responsible Official/ Primary Contact Name and Title:	Mr. Mike Schoch Director Of Environmental Regulatory & Safety	**Phone No.:** **Fax No.:**	(713) 209-2416 (713) 209-2420	**Email:**	MSCHOCH@HILCORP.COM
Technical Contact/ Consultant Name and Title:	Mr. John Connolly, Agent Energy Resources Development, Inc.	**Phone No.:** **Fax No.:**	(225) 753-4723 (225) 753-4661	**Email:**	ERSSES@COX.NET

GENERAL RULES CHECK	**YES**	**NO**	**COMMENTS**
Is confidential information included in the application?		X	No confidential information has been submitted.
Are there affected NSR or Title V permits for the project?		X	This is an existing PBR site with no previously issued NSR or Title V Permits.
Is each PBR > 25/250 tpy?		X	Registered Emissions: 9.17 tpy VOC, <0.01 tpy SO_2, 9.58 tpy CO, 1.59 tpy NO_X, 0.06 tpy HCHO, and 0.09 tpy PM_{10}.
Are PBR sitewide emissions > 25/250 tpy?		X	See Estimated Emissions Table
Are there permit limits on using PBRs at the site?		X	
Is PSD or Nonattainment netting required?		X	This site is not one of the 28 named sources and emissions are below the federal significance as major source levels, therefore, PSD and NA review and netting are not required.
Do NSPS, NESHAP, or MACT standards apply to this registration?		X	None represented.
Does NOx Cap and Trade apply to this registration?	X		The Federal Gayette Lease Tank Battery site is located in a designated ozone non-attainment county. Both VOC and NOX emissions are decreasing with this PBR revision.
Is the facility in compliance with all other applicable rules and regulations?	X		The company submitted Checklist for 106.352, 106.512, and 106.4

DESCRIBE OVERALL PROCESS AT THE SITE

Hilcorp Energy Company operates the Federal Gayette Lease Tank Battery located near Alta Loma in Galveston County.

The facility is a typical oil and gas production site that produces hydrocarbons from natural reservoirs through deep wells. The oil, gas, and salt water are separated at the surface. The oil is transported via tank truck and the gas is transported via pipeline. The saltwater tanks are not designed to process oil, and are therefore not claimed.

DESCRIBE PROJECT AND INVOLVED PROCESS

This action is to replace the existing compressor engine (EPN: COMP1) with a 332-hp Caterpillar G 3408 TA compressor engine (EPN: COMP2). The tank loading and fugitive emissions were also recalculated to account for current production rates, oil gravity, and operating conditions. The oil production has declined from 250 barrels of oil per day (bopd) to 37 bopd resulting in a net decrease in VOC emissions.

Federal Gayette Lease Tank Battery site will consist of one compressor engine, four crude oil storage tanks, one pneumatic pump, truck loading, and fugitive emissions.

No planned MSS emissions have been represented or reviewed for this registration.

TECHNICAL SUMMARY - DESCRIBE HOW THE PROJECT MEETS THE RULES

OIL AND GAS FACILITY GENERAL INFORMATION			
	Not provided	**H2S Content of Inlet Gas:**	0.00 ppmv H2S per analysis

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Natural Gas Throughput (MMSCF/day):			
Oil Throughput (bbl/day):	37.00	**Is the gas sweet or sour?**	
Condensate Throughput (bbl/day):		**Is this an existing site?**	
Produced Water Throughput (bbl/day):	Not provided	**Has the site been registered before?**	

EQUIPMENT/PROCESSES AT SITE

Number of each:	**Compressor Engines:**	1	**Glycol dehydrators:**	0	**VRU:**	0
	Separators:	1	**Amine units:**	0	**Other:**	
	Storage Tanks:	4	**Heater Treaters:**	0	**Other:**	
	Truck Loading:	1	**Flares:**	0	**Other:**	

STORAGE TANKS

Tank Identifier (EPN)	Capacity of Tank	Throughput (bbl/day)	Contents of Tank	Working and breathing Loss Calculation Method*	Flash Loss Calculation Method	Other
T1 / Oil Storage Tank	300 bbl	9.25	crude oil	Tanks 4.0	Vasquez Beggs	
T2 / Oil Storage Tank	300 bbl	9.25	crude oil	Tanks 4.0	Vasquez Beggs	
T3 / Oil Storage Tank	300 bbl	9.25	crude oil	Tanks 4.0	Vasquez Beggs	
T4 / Oil Storage Tank	300 bbl	9.25	crude oil	Tanks 4.0	Vasquez Beggs	

TANKS 4.0 SOFTWARE [FOR ESTIMATING WORKING AND BREATHING LOSSES FROM STORAGE TANKS]

Tank Identifier (EPN)	Throughput (gallons/year) (pg. 1 of report)	Turnovers per year (pg. 1 of report)	Mixture/ Component (pg. 2 of report)	Basis for VP Calculations (pg. 2 of report)	Vapor MW (pg. 2 of report)	Results (lb/year) (last page of report)	Emissions after any controls (tpy)
T1 / Oil Storage Tank	145,686.30	12.30	Crude oil RVP=5	Option 4: RVP=5	50.00	1,448.46	1.238
T2 / Oil Storage Tank			Crude oil	Option 4: RVP=5	50.00		1.238
T3 / Oil Storage Tank			RVP=5	Option 4: RVP=5	50.00		1.238
T4 / Oil Storage Tank			Crude oil	Option 4: RVP=5	50.00		1.238

VASQUEZ-BEGGS CORRELATION [FOR ESTIMATING FLASH LOSSES FROM STORAGE TANKS]

Tank Identifier (EPN)	API Gravity	Separator Pressure (psig)	Separator Temperature (°F)	Separator Gas Gravity at Initial Conditions	Throughput (bbl/day)	Stock Tank Gas Molecular Weight	Fraction VOC (C3+) of Stock Tank Gas	Results (tpy)	Emissions after any controls (tpy)
	(16 - 58°)	(35.3 - 5250 psig)	70 - 295°F	0.56 - 1.18	(no limits)	18 - 125 lb/lb-mole	50% - 100%		
T1 / Oil Storage Tank	38.00	50.00	125	0.65	9.25	49	80%	0.50	1.24
T2 / Oil Storage Tank	38.00	50.00	125	0.65	9.25	49	80%	0.50	1.24
T3 / Oil Storage	38.00	50.00	125	0.65	9.25	49	80%	0.50	1.24

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Tank									
T4 / Oil Storage Tank	38.00	50.00	125	0.65	9.25	49	80%	0.50	1.24

Justification as to why use of Vasquez-Beggs is appropriate: Input parameters are within the parameters of the Vasquez Beggs equation.

TRUCK LOADING [EMISSIONS CALCULATED USING L_L=(12.46)(S)(P)(M)/(T) EQUATION FROM AP-42, SECTION 5.2-4]

S	P (psia)	M (lb/lb-mole)	T (°R)	L_L (lb VOC/1000 gallons loaded)	Hourly Loading Rate (gallons/hour)	Annual Loading Rate (gallons/year)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
0.5	5.00	50.00	528	2.95	8,400	567,210.00	24.78	0.817

Fugitive Emissions

Fugitive Emissions - Components in Gas Service

Component in Gas Service	Quantity	Emission Factor (lb/hr-source)	Emissions (lb/hr)	Emissions (tpy)	VOC Wt %	Total Emissions (lb/hr)	Total Emissions (tpy)
Valves	21	0.009920	0.208338	0.9125	0.063		0.001
Pump Seal	1	0.00529	0.005291	0.023175	0.063		
Connector	40	0.00044	0.017637	0.07725	0.063		
Flange	40	0.00068	0.034392	0.150638	0.063		
Open-ended Line	0	0.00441	0.00	0.00	0.063		
Other	0	0.01940	0.00	0,00	0.063		
					Total	**0.00**	**0.001**

Fugitive Emissions - Components in Light Oil Service

Component in Lt. Liquid Service	Quantity	Emission Factor (lb/hr-source)	Emissions (lb/hr)	Emissions (tpy)	VOC Wt %	Total Emissions (lb/hr)	Total Emissions (tpy)
Valves	75	0.0055	0.413369	1.810556	100	0.413	1.811
Pump Seal	1	0.02866	0.02866	0.125532	100	0.029	0.126
Connector	140	0.0004630	0.64816	0.283895	100	0.065	0.284
Flange	140	0.00024	0.033951	0.148707	100	0.034	0.149
Open-ended Line	0	0.00309	0.00	0.00	100	0.00	0.00
Other	0	0.01653	0.00	0.00	100	0.00	0.00
					Total	**0.541**	**2.37**

Fugitive Emissions - Components in Water Service

Component in Lt. Liquid Service	Quantity	Emission Factor (lb/hr-source)	Emissions (lb/hr)	Emissions (tpy)	VOC Wt %	Total Emissions (lb/hr)	Total Emissions (tpy)
Valves	2	0.0002161	0.000432	0.001893	100	0.00	0.002
Pump Seal	0	0.0000529	0.00	0.00	100	0.00	0.00
Connector	2	0.0002425	0.000485	0.002124	100	0.00	0.002
Flange	4	0.0000064	2.56E-05	0.000112	100	0.00	0.00
Open-ended Line	0	0.0005512	0.00	0.00	100	0.00	0.00
Other	0	0.0308649	0.00	0.00	100	0.00	0.00
					Total	**0.00**	**0.004**

Total Fugitives - All Services

Service	Emissions (lb/hr)	Emissions (tpy)
Gas	0.00	0.001
Light Oil	0.541	2.37
Water	0.00	0.004
Total	**0.541**	**2.375**

NATURAL GAS FIRED COMPRESSOR ENGINES

Engine Identifier (EPN / name)		Hour of Operation per			Rich or Lean Burn		Vendor Data Sheet Included? (required if	Emission Factor / Origin of Emission Factor (g/hp-hr)				
							VOC (NMNEHC)	NOx	CO	SO_2	HCHO (formal-dehyde)	
		332	8,760	1,053	Rich	4	YES					

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COMP2 / Caterpillar 3408 Compressor Engine							0.32 Mfg.	0.50 Mfg.	3.00 Mfg.	0.00185 AP-42	0.02 Mfg.	Air -fuel ratio controller NSCR Catalyst

30 TAC §106.352 RULE CHECK		
REQUIREMENTS	YES, NO, or n/a	OTHER / COMMENTS
If the site conditions the natural gas (with a glycol dehydrator, amine unit, sulfur recovery unit, etc.), it handles less than two long tons per day of sulfur compounds (1 long ton = 2240 pounds).	NO	Site is sweet. No gas conditioning is performed.
(1) All compressors will meet the requirements of 106.512.	YES	
(1) All flares will meet the requirements of 106.492.	N/A	No site flare.
(2) Total emissions, including process fugitives, combustion unit stacks, separator, or other process vents, tank vents, and loading emissions from all such facilities constructed at a site under this section, will be equal to or below 25 tons per year (tpy) each of sulfur dioxide (SO_2), all other sulfur compounds combined, or all volatile organic compounds (VOC) combined; and 250 tpy each of nitrogen oxide and carbon monoxide. Emissions of VOC and sulfur compounds other than SO_2 must include gas lost by equilibrium flash as well as gas lost by conventional evaporation.	YES	See Estimated Emissions Table.
(3) If the facility handles sour gas, it will be located at least 1/4 mile from any recreational area or residence or other structure not occupied or used solely by the owner or operator of the facility or the owner of the property upon which the facility is located.	N/A	Site is sweet. Actual Distance = >100 feet.
(4) Total emissions of sulfur compounds, excluding sulfur oxides, from all vents will be equal to or below 4.0 pounds per hour (lb/hr).	YES	Actual Sulfur Emissions = 0.001 lb/hr SO_2.
(4) The height of each vent emitting sulfur compounds meets the following requirements, and is in no case less than 20 feet: (NOTE: other values may be interpolated) H_2S (lb/hr) — Minimum Vent Height (ft) 0.27 — 20 0.60 — 30 1.94 — 50 3.00 — 60 4.00 — 68	YES	Actual Vent Height = 24 feet.
(5) If the site handles sour gas, the company will register the site by submitting Form PI-7 or PI-7-CERT before operations begin.	N/A	Site is sweet. Company registered using Form PI-7.

30 TAC §106.512 RULE CHECK		
REQUIREMENTS	YES, NO, or n/a	OTHER / COMMENTS
(1) The engines or turbines have been registered with Form PI-7 or PI-7-CERT within 10 days of the start of construction. Engines and turbines rated less than 240 horsepower (hp) need not be registered, but must meet paragraphs (5) and (6) of this section, relating to fuel and protection of air quality.	YES	Horsepower of engine(s) = 332.
(1) Table 29 has been submitted for each proposed gas or liquid fuel-fired stationary internal combustion reciprocating engine.	YES	
(1) Table 31 has been submitted for each proposed gas turbine.	N/A	N turbines are used at this site.
(2) Any engines rated greater than 500-hp will meet the requirements of subparagraphs (A) - (C) of this paragraph.	N/A	
(2)(A) Emissions of nitrogen oxides (NO_x) will not exceed the following limit: *Check which limit applies:*		Actual NOx Emissions = 0.50 g/hp-hr.
(2)(A)(vi) 11.0 g/hp-hr for any compression-ignited liquid-fired engine.		
(2)(B) The engine requires an automatic air-fuel ratio (AFR) controller in order to meet the NOx limits in subparagraph (2) (A).	YES	
	YES	

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(2)(B) The engine requires an automatic air-fuel ratio (AFR) controller in order to meet the following requirements: An AFR controller shall be deemed necessary for any engine controlled with a non-selective catalytic reduction (NSCR) converter and for applications where the fuel heating value varies more than ± 50 British thermal unit/standard cubic feet from the design lower heating value of the fuel. If an NSCR converter is used to reduce NO_x, the automatic controller shall operate on exhaust oxygen control.		
2)(C) The records specified in (2)(C) of this PBR will be created and maintained by the owner or operator for a period of at least two years, made available, upon request, to the commission and any local air pollution control agency having jurisdiction.	YES	Per the 106.512 Checklist
(4) Any engine or turbine rated less than 500 hp or used for temporary replacement purposes is exempt from the emission limitations of paragraphs (2) and (3) above. Temporary replacement engines or turbines shall be limited to a maximum of 90 days of operation after which they shall be removed or rendered physically inoperable.	NO	Horsepower: 332 Temporary? NO.
(5) The gas fuel will be limited to: sweet natural gas or liquid petroleum gas, fuel gas containing no more than ten grains total sulfur per 100 dry standard cubic feet, or field gas.	YES	Type of fuel: Natural Gas
(6) Compliance with National Ambient Air Quality Standard (NAAQS) in the area of the proposed facility has been demonstrated.	YES	Which method was used (A, B, or C)? C . *Delete rows below that are not needed.*

(6)(C) Distance to from all existing and proposed facilities on the property to the nearest property line was used to demonstrate NAAQS:

The total emissions of NO_x (nitrogen oxide plus NO_2) will not exceed the most restrictive of the 250 tpy or the value (0.3125 D) tpy, where D equals the shortest distance in feet from any existing or proposed stack to the nearest property line.

D (feet)	0.3125 X D	Actual NOx emissions (tpy)
100	31.25	1.59

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(7) The engine or turbine will not be used to generate electricity.	YES	The engine will not be used to generate electricity

ESTIMATED EMISSIONS

EPN / Emission Source	Specific VOC or Other Pollutants	VOC		NOx		CO		PM_{10}		SO_2		Other	
		lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
T1 / 300 bbl Oil Storage Tank (Working Breathing & Flash)		0.283	1.238										
T2 / 300 bbl Oil Storage Tank (Working Breathing & Flash)		0.283	1.238										
T3 / 300 bbl Oil Storage Tank (Working Breathing & Flash)		0.283	1.238										
T4 / 300 bbl Oil Storage Tank (Working Breathing & Flash)		0.283	1.238										
P1 / Pneumatic Pump		0.002	0.009										
COMP2 / 332-hp Caterpillar 3408 Compressor Engine	HCHO	0.233	1.022	0.37	1.597	2.19	9.583	0.02	0.094	0.001	0.006	0.02	0.064
Load 1 / Truck Loading		24.78	0.817										
FUG / Fugitive Emissions		0.54	2.37										

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TOTAL EMISSIONS (TPY):		**9.17**		**1.59**		**9.58**		**0.09**		**<0.01**		**0.06**
MAXIMUM OPERATING SCHEDULE:		**Hours/Day**		**Days/Week**		**Weeks/Year**				**Hours/Year**		8,760

SITE REVIEW / DISTANCE LIMIT	Yes	No	Description/Outcome	Date	Reviewed by
Site Review Required?		X		July 15, 2009	Mr. Clyde Price
PBR Distance Limits Met?	X		The distance to the nearest property line and the nearest off-property receptor is >100 feet.	July 15, 2009	Mr. Clyde Price

	TECHNICAL REVIEWER	PEER REVIEWER	FINAL REVIEWER
SIGNATURE:			See Hard Copy.
PRINTED NAME:	Mr. Clyde Price	Ms. Julie Steger	Ms. Anne M. Inman, P.E., Manager
DATE:	July 30, 2009	July 30, 2009	July 30, 2009

BASIS OF PROJECT POINTS	POINTS
Base Points: 106.352	1.50
Project Complexity Description and Points: 106.512	0.50
Technical Reviewer Project Points Assessment:	2.00
Final Reviewer Project Points Confirmation:	