August 7, 2015

Ms. Alicia Boltz
Air Quality Engineer
Wyoming Division of Environmental Quality
122 W. 25th Street
Herschler Building, 2E
Cheyenne, WY 82002

Subject: **A0000683 (Dry Piney 20); NOx Offset Supplemental Information**
A0000684 (Dry Piney 18); NOx Offset Supplemental Information
NOx Reductions Associated at the Dry Piney Central Facility (CT-10941)

Ms. Boltz,

On behalf of our client Wexpro Company (Wexpro), Lesair is providing supplemental information to clarify the available offset NOx emissions available to Wexpro Company to complete the proposed equipment changes at the Dry Piney 18 and 20 well facilities.

In April 2013 Wexpro Company submitted an application associated with the Dry Piney Central Facility (CT-10941) to the Wyoming Air Quality Division. This modification informed the Division that:

- Two (2) of the three (3) 1.8 MMBtu/hr heater treater burners at the Dry Piney Central Facility were replaced with 0.375 MMBtu/hr burner assemblies.
- The two (2) 0.375 MMBtu/hr burners are listed as operating 2920 hours per year (hrs/yr).
- The operating hours of a third 1.8 MMBtu/hr heater treater should be considered to be 2920 hrs/yr.

Please find attached the process heater emission calculations submitted in April 2013 which result in annual process heater NOx emissions of 1.06 (~1.1) TPY.

In the Application Analysis for CT-10941, the total facility process heater NOx emissions are listed as 1.5 TPY NOx (see attached emission summary table from AP-10941). This process heater NOx emission total accounts for two (2) of the three (3) 1.8 MMBtu/hr heater treater burners operating at 4380 hrs/yr with the third heater treater being considered a "spare".

Accounting for the changes made by Wexpro in April 2013 results in a net reduction in Dry Piney Central process heater emissions of -0.4 TPY NOx. This difference in process heater emissions is all attributed to the changes made to the heater treaters.

An Emissions Offset table has been included with this letter demonstrating the applicable -0.4 ton NOx credit attributed to the Dry Piney Central Facility due to the process heater changes submitted in 2013.

If you require any more information or have further questions please feel free to contact Mr. Tom Bradley (Wexpro Company) at (801) 324-3062 or via email at Tom.Bradley@questar.com. You may also contact me at (303) 904-2525 or via email at TySmith@Lesair.com.

Sincerely,

Ty J. Smith
Sr. Project Manager

Enclosure:
cc: Mr. Tom Bradley (Wexpro Company)

Company Name: Wexpro Company
Field Name: Dry Piney
Facility Name: Dry Piney Central Facility

Emission Calculation for External Combustion Sources

AP-42 Calculation Method

(For Estimating Emissions, Using Emission Factors from EPA AP-42, Table 1.4-1 and Table 1.4-2)

Burner Data

Reference No.	Quantity	Burner Rating (MMBtu/Hr)	Equipment	Annual Op Time (hours)	Fuel Type	Fuel Htg Value (Btu/scf)
004	1	1.800	Heater Treater(s)	2920	Field	1130
005	2	0.375	Heater Treater(s)	2920	Field	1130
006	5	0.500	Tank Heater(s)	4380	Field	1130
007	1	0.250	Tank Heater(s)	4380	Field	1130

Emission Factors

Reference No.	Burner Rating (MMBtu/Hr)	Emission Factors				
		NOx (Lb/MMFt^3)	CO (Lb/MMFt^3)	SO_2 (Lb/MMFt^3)	PM (Lb/MMFt^3)	VOC (Lb/MMFt^3)
004	1.800	100.0	84.0	0.6	7.6	5.5
005	0.375	100.0	84.0	0.6	7.6	5.5
006	0.500	100.0	84.0	0.6	7.6	5.5
007	0.250	100.0	84.0	0.6	7.6	5.5
EF Source		AP-42	AP-42	AP-42	AP-42	AP-42

Source Emissions

Reference No.	Source Emissions									
	NOx		CO		SO_2		PM		VOC	
	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
004	0.20	0.29	0.16	0.24	0.00	0.00	0.01	0.02	0.01	0.02
005	0.08	0.12	0.07	0.10	0.00	0.00	0.01	0.01	0.00	0.01
006	0.27	0.59	0.23	0.50	0.00	0.00	0.02	0.05	0.01	0.03
007	0.03	0.06	0.02	0.05	0.00	0.00	0.00	0.00	0.00	0.00

EQUIPMENT LIST

- three (3) 6' x 20' heater treaters w/ 1.8 MMBtu/hr heaters (one spare treater)
- five (5) 0.5 MMBtu/hr tank heaters
- one (1) 0.25 MMBtu/hr tank heater
- four (4) 400-bbl production tanks
- two (2) 400-bbl produced water drain tanks
- one (1) 3000-bbl bbl produced water tank
- one (1) 750-bbl produced water skim tank
- one (1) 130-bbl glycol tank
- one (1) 150-bbl methanol tank
- one (1) pneumatic water circulation pump
- one (1) Elastec M100A Smart Ash Incinerator
- two (2) Pyrohelix® smokeless combustion devices w/ continuous pilot monitoring systems (heater treater gas control)

EMISSIONS SUMMARY

Dry Piney Central Facility
108 BPD Nugget formation oil production [1]
5 BPD Frontier-Bear River formation condensate production [2]
36 MCFD treater overhead gas [1]

two wells: Dry Piney Unit 18 and Dry Piney Unit 20

SOURCE	EMISSIONS (TPY) [2]			
	VOC	HAP	NO_X	CO
Heater Treater Overhead Gas (used for gas blanket in 3000-bbl produced water tank)				
UNCONTROLLED	392.6	49.1		
CONTROLLED	7.9	1.0	1.5	0.4
Process Heaters			1.5	1.3
Oil / Condensate Tanks	9.3	0.5		
Process Fugitives	4.7	insig		
Pneumatic Pump	0.3	insig		
Pneumatic Liquid Level and Pressure Controllers	insig	insig		
Smart Ash Incinerator	insig	insig	insig	insig
Total Uncontrolled Facility Emissions	406.9	49.6	1.5	1.3
Total Controlled Facility Emissions	22.2	1.5	3.0	1.7

[1] average daily production reported by the WOGCC, March 2010 -- May 2010
[2] average daily production reported by applicant
[3] rounded to the nearest 0.1 ton

SUBLETTE COUNTY PERMITTED EMISSIONS April 1, 2008 - PRESENT

company	field	facility	date of permit application	date of receipt	permit/waiver / AP #	Equipment Design / Current Actual Emissions (TPY)		Baseline Emissions (TPY)		increase/decrease from baseline emissions (TPY)		VOC Offset Bank	NOx Offset Bank	Reason for Change
						VOC	NO_x	VOC	NO_x	VOC	NO_x			
Wexpro	Dry Piney	Dry Piney 35	10/22/2010			19.8	0.7	30.4	0.7	-10.6	0.0	-10.6	0.0	Swapped Kimray 4015 for crippled 2015 pump, accounted for additional HT pump
Wexpro	Dry Piney	Dry Piney Central Facility	7/12/2010	11/10/2010	CT-10941	22.2	3.0	21.2	3.3	1.0	-0.3	1.5	-0.3	Added 2nd control device and 0.5 MMBtu/hr tank heater
Wexpro	Dry Piney	Dry Piney Central Facility	4/3/2013		Pending	22.2	2.6	22.2	3.0	0.0	-0.4	0.0	-0.4	Changed (2) heater treater burners, adjusted htr trtr operating hours
Wexpro	Dry Piney	Dry Piney 20	6/7/2015			2.1	1.7	1.9	0.7	0.2	1.0	0.3	1.1	Proposed replacement engine
Wexpro	Dry Piney	Dry Piney 18	6/7/2015			1.7	1.1	1.5	1.5	0.2	-0.4	0.3	-0.4	Emissions reductions on existing engine being claimed
		Wexpro TOTAL				68	9.1	77.2	9.2	-9.20	-0.10	-8.50	0.00	

Notes:

RECEIVED

JUL 07 2015

AIR QUALITY DIVISION

July 1, 2015

Ms. Alicia Boltz
Air Quality Engineer
Wyoming Division of Environmental Quality
122 W. 25th Street
Herschler Building, 2E
Cheyenne, WY 82002

Subject: A0000684; Dry Piney 18 Engine Driven Generator Modification Incomplete Application Letter Follow-up Information

Ms. Boltz,

As discussed, please find attached a completely revised application associated with a proposed engine modification at the Dry Piney 18 (A0000684). This modification increases the horsepower from 254 Hp to 295 Hp and upgrades the NSCR catalyst to current WAQD PBACT thresholds for the non-attainment area. This submittal corrects all of the known outstanding issues with both the initial application and the follow-up application submitted on June 8, 2015.

1. Per your request, include an IMPACT "Emission Information" form for each source.

2. Per the Wyoming Air Quality Division's baseline process, Wexpro is utilizing the average actual run hours and average actual emission results from engine stack test performed during the 24 month period of 2006/2007 to calculate the baseline emissions used in the emissions offset process.

3. The NSCR catalyst has been changed to meet a Wyoming PBACT control standard of 0.5 gm/hp-hr for NOx instead of the 0.7 gm/hp-hr value in the initial application.

4. Wexpro is requesting reduced run hours in order to have sufficient offsets for the proposed change in engines. Wexpro is requesting 7,000 hours per year for the proposed Waukesha F2895G with a NSCR catalyst and air fuel ratio controller.

To ensure the accurate replacement of the corrected or additional information, Lesair has provided a complete application except for the IMPACT "Cover Sheet" form. If you require any more information or have further questions please feel free to contact Mr. Tom Bradley (Wexpro Company) at (801) 324-3062 or via email at Tom.Bradley@questar.com. You may also contact me at (303) 904-2525 or via email at TySmith@Lesair.com.

Sincerely,

Ty J. Smith
Sr. Project Manager

Enclosure:
cc: Mr. Tom Bradley (Wexpro Company)

Company Name: **Wexpro Company**
Facility Name: **Dry Piney 18**

Attachment A

WAQD IMPACT Forms

Prepared for:
Wexpro Company

Prepared by:
Lesair Environmental, Inc.
www.Lesair.com

Specific Emission Unit Attributes:

Engine

Company Equipment ID:

Company Equipment Description: (1) 295 HP Waukesha

Operating Status: Operating

Initial Construction Commencement Date: 11/1/1980

Initial Operation Commencement Date: 11/1/1980

Most Recent Construction/ Modification Commencement Date: Pending

Most Recent Operation Commencement Date: Pending

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Other

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New catalyst being installed and emissions reductions claimed

Name Plate Rating: 353 Units: hp

Site Rating: 295 Units: hp

Primary Fuel Type: Field Gas

Secondary Fuel Type:

Model Name and Number: Waukesha

Engine Type: 4 Stroke Rich Burn

Serial Number Tracking Table:

Serial Number: 354033 Order Date:

Manufacturer Name: Waukesha

Construction/Installation Commencement Date: 11/1/1980

Operation Commencement/ Start-up Date: 11/1/1980

Manufacture Date: pre-1980

Btu Content: 1619.8 Units: BTU/scf

Fuel Sulfur Content: 0 Units:

Type of Service: Generator

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

2-02-002-54

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 7000

Control Equipment: Yes

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: NOx, CO, VOC

Proposed BACT: NSCR Catalyst with AFR Controller

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant:

Proposed LAER:

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart:

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart:

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: Subpart ZZZZ

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Revised 11/3/2014

Control Equipment:

Catalytic NOx Control Technology

Manufacturer: _____ Date Installed: Pending

Model Name and Number: _____ Company Control Equipment ID: _____

Company Control Equipment Description: NSCR catalyst

Pollutant(s) Controlled:

☑ CO	☑ NOx	☐ Pb	☐ SO2	☑ VOC	☐ PM	
☐ PM (FIL)	☐ PM Condensible	☐ PM 10 (FIL)	☐ PM 2.5 (FIL)	☐ PM 10	☐ PM 2.5	
☐ Other						

NOTE: The following fields require numeric values unless otherwise denoted with an asterisk*

Design Control Efficiency (%): >95% Capture Efficiency (%): 100

Operating Control Efficiency (%): 99%

Catalytic Reduction Type:* Nonselective Catalytic

Reagent Type: _____

Reagent Injection Rate- specify units: _____

Reagent Slip Concentration (ppbv): _____

Reagent Slip Concentration % O2: _____

Inlet Gas Flow Rate (acfm): 2017

Inlet Gas Temp (F): 988 Outlet Gas Temp (F): 1038

Air Fuel Ratio Controller:* Yes

☑ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other emission units that are also vented to this control equipment:* _____

List all release point IDs associated with this control equipment:* _____

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	Insignificant	Insig	NA	Insig	Insig	NA
2.)	PM #10 microns in diameter (PE/PM10)	Insignificant	Insig	NA	Insig	Insig	NA
3.)	PM #2.5 microns in diameter (PE/PM2.5)	Insignificant	Insig	NA	Insig	Insig	NA
4.)	Sulfur dioxide (SO2)	Insignificant	NA	NA	NA	NA	NA
5.)	Nitrogen Oxides (NOx)	37.0	0.5	gm/Hp-hr	0.33	1.1	PBACT
6.)	Carbon monoxide (CO)	25.6	1.0	gm/Hp-hr	0.65	2.3	NSCR
7.)	Volatile organic compounds (VOC)	0.9	0.3	gm/Hp-hr	0.20	0.7	NSCR
8.)	Lead (Pb)	NA	NA	NA	NA	NA	NA
9.)	Total Hazardous Air Pollutants (HAPs)	0.6	0.05	gm/Hp-hr	0.03	0.1	NSCR
10.)	Fluoride (F)	NA	NA	NA	NA	NA	NA
11.)	Hydrogen Sulfide (H2S)	NA	NA	NA	NA	NA	NA
12.)	Mercury (Hg)	NA	NA	NA	NA	NA	NA
13.)	Total Reduced Sulfur (TRS)	NA	NA	NA	NA	NA	NA
14.)	Sulfuric Acid Mist (SAM)	NA	NA	NA	NA	NA	NA

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)	Formaldehyde	0.6	0.05		0.03	0.1	
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Revised 1/22/2015

Specific Emission Unit Attributes:

Electric Generating Unit

Company Equipment ID:

Company Equipment Description: Thermoelectric Generator

Operating Status: Operating

Initial Construction Commencement Date: 9/10/2006

Initial Operation Commencement Date: 9/10/2006

Most Recent Construction/ Modification Commencement Date: 9/10/2006

Most Recent Operation Commencement Date: 9/10/2006

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Modification

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

Emissions reductions are being claimed, facility being re-permitted through IMPACT

Unit Type: Other

Heat Input Rating (MMBtu/hr): 0.02

Primary Fuel Type: Field Gas

Secondary Fuel Type:

Manufacturer Name: Global

Model Name and Number: CP5120N

Btu Content: 1619.8 Units: BTU/scf

Fuel Sulfur Content: 0 Units: %

Net Electrical Output (MW): 0.00012

Gross Electrical Output (MW): 0.00012

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-99

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 8760

Control Equipment: NA

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	Insignificant	Insig	NA	Insig	Insig	NA
2.)	PM #10 microns in diameter (PE/PM10)	Insignificant	Insig	NA	Insig	Insig	NA
3.)	PM #2.5 microns in diameter (PE/PM2.5)	Insignificant	Insig	NA	Insig	Insig	NA
4.)	Sulfur dioxide (SO2)	Insignificant	NA	NA	NA	NA	NA
5.)	Nitrogen Oxides (NOx)	Insignificant	Insig	NA	Insig	Insig	NA
6.)	Carbon monoxide (CO)	Insignificant	Insig	NA	Insig	Insig	NA
7.)	Volatile organic compounds (VOC)	Insignificant	Insig	NA	Insig	Insig	NA
8.)	Lead (Pb)	NA	NA	NA	NA	NA	NA
9.)	Total Hazardous Air Pollutants (HAPs)	Insignificant	Insig	NA	Insig	Insig	NA
10.)	Fluoride (F)	NA	NA	NA	NA	NA	NA
11.)	Hydrogen Sulfide (H2S)	NA	NA	NA	NA	NA	NA
12.)	Mercury (Hg)	NA	NA	NA	NA	NA	NA
13.)	Total Reduced Sulfur (TRS)	NA	NA	NA	NA	NA	NA
14.)	Sulfuric Acid Mist (SAM)	NA	NA	NA	NA	NA	NA

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Revised 1/22/2015

Specific Emission Unit Attributes:

Fugitives

Company Equipment ID:

Company Equipment Description: Fugitive Emissions

Operating Status: Operating

Initial Construction Commencement Date: 10/15/1970

Initial Operation Commencement Date: 10/15/1970

Most Recent Construction/ Modification Commencement Date: 10/15/1970

Most Recent Operation Commencement Date: 10/15/1970

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Modification

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

Emissions reductions are being claimed, facility being re-permitted through IMPACT

Type of Fugitive Emission: Fugitive Leaks at O&G

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-99

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 8760

Control Equipment: NA

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	NA	NA	NA	NA	NA	NA
2.)	PM #10 microns in diameter (PE/PM10)	NA	NA	NA	NA	NA	NA
3.)	PM #2.5 microns in diameter (PE/PM2.5)	NA	NA	NA	NA	NA	NA
4.)	Sulfur dioxide (SO2)	NA	NA	NA	NA	NA	NA
5.)	Nitrogen Oxides (NOx)	NA	NA	NA	NA	NA	NA
6.)	Carbon monoxide (CO)	NA	NA	NA	NA	NA	NA
7.)	Volatile organic compounds (VOC)	1.06	1.06	TPY	0.24	1.06	Table 2-4, EPA-453/R-95-017
8.)	Lead (Pb)	NA	NA	NA	NA	NA	NA
9.)	Total Hazardous Air Pollutants (HAPs)	Insignificant	Insig	NA	Insig	Insig	Table 2-4, EPA-453/R-95-017
10.)	Fluoride (F)	NA	NA	NA	NA	NA	NA
11.)	Hydrogen Sulfide (H2S)	NA	NA	NA	NA	NA	NA
12.)	Mercury (Hg)	NA	NA	NA	NA	NA	NA
13.)	Total Reduced Sulfur (TRS)	NA	NA	NA	NA	NA	NA
14.)	Sulfuric Acid Mist (SAM)	NA	NA	NA	NA	NA	NA

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Revised 11/3/2014

Release Point Information:

Complete the table below for ***each*** release point. Please include release point information for each emission unit. Multiple attachments may be necessary. A release point is a point at which emissions from an emission unit are released into the ambient (outside)air. List each individual release point on a separate pair of lines (release point ID and description). ***For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)***

Stack Release Point Information		
Company Release Point ID:	Release Point Type:	Vertical
Waukesha F2895G	Release Point Latitude:	42.33888
	Release Point Longitude:	-110.38180
Company Release Point Description:	Base Elevation (ft):	8,825
Engine driven generator for purposes of power supply to equipment on location.	Stack Height (ft):	14
	Stack Diameter (ft):	0.67
	Exit Gas Velocity (ft/s):	41.27
	Exit Gas Temp (F):	892
	Exit Gas Flow Rate (acfm):	2476
Company Release Point ID:	Release Point Type:	Vertical
Thermoelectric Generator	Release Point Latitude:	42.33888
	Release Point Longitude:	-110.38180
Company Release Point Description:	Base Elevation (ft):	8,825
	Stack Height (ft):	NA
	Stack Diameter (ft):	NA
	Exit Gas Velocity (ft/s):	NA
	Exit Gas Temp (F):	NA
	Exit Gas Flow Rate (acfm):	NA
Company Release Point ID:	Release Point Type:	
	Release Point Latitude:	
	Release Point Longitude:	
Company Release Point Description:	Base Elevation (ft):	
	Stack Height (ft):	
	Stack Diameter (ft):	
	Exit Gas Velocity (ft/s):	
	Exit Gas Temp (F):	
	Exit Gas Flow Rate (acfm):	
Company Release Point ID:	Release Point Type:	
	Release Point Latitude:	
	Release Point Longitude:	
Company Release Point Description:	Base Elevation (ft):	
	Stack Height (ft):	
	Stack Diameter (ft):	
	Exit Gas Velocity (ft/s):	
	Exit Gas Temp (F):	
	Exit Gas Flow Rate (acfm):	

Revised 11/3/2014

Complete the table below for each fugitive (area, volume, line) release point. List each individual release point on a separate line.

Fugitive Release Point Information	
Company Release Point ID: Fugitives Company Release Point Description: Fugitive leaks from equipment on location (wellhead, genset)	Release Point Latitude: 42.33888 Release Point Longitude: -110.38180 Release Height (ft): NA
Company Release Point ID: Company Release Point Description:	Release Point Latitude: Release Point Longitude: Release Height (ft):
Company Release Point ID: Company Release Point Description:	Release Point Latitude: Release Point Longitude: Release Height (ft):
Company Release Point ID: Company Release Point Description:	Release Point Latitude: Release Point Longitude: Release Height (ft):

Company Name: **Wexpro Company**
Facility Name: **Dry Piney 18**

Attachment B

Supporting Emissions Calculations

Prepared for:
Wexpro Company

Prepared by:
Lesair Environmental, Inc.
www.Lesair.com

Proposed Process Description

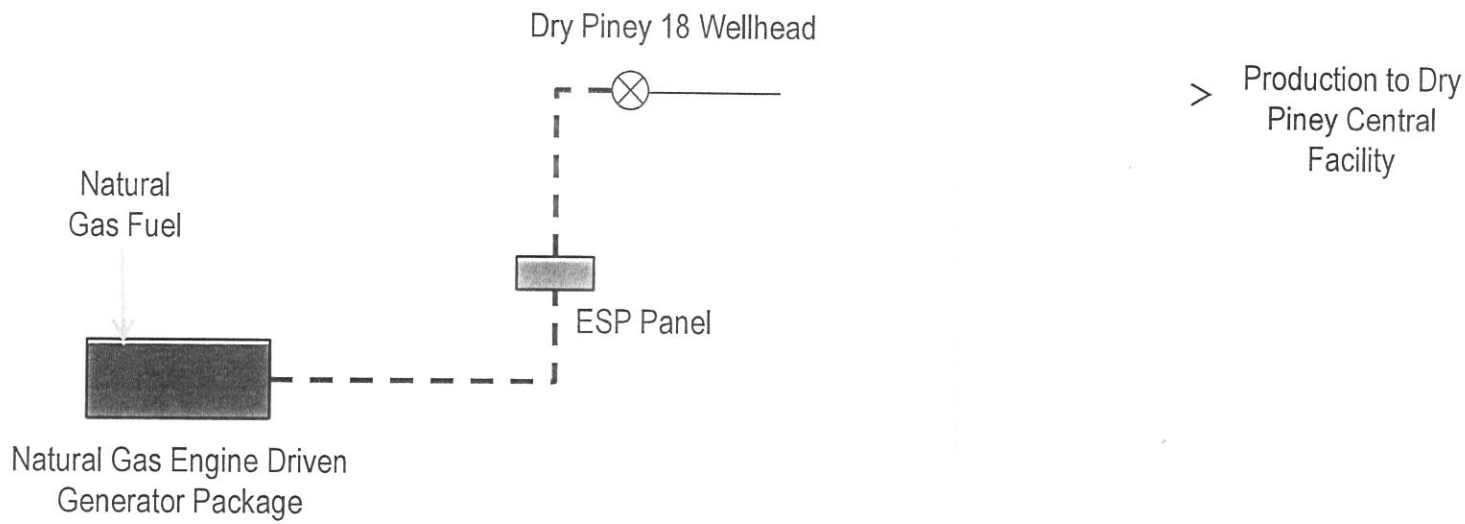
The commingled fluid stream (containing natural gas, condensate and produced water) is pumped from the well by use of an electric submersible pump. The comingled stream flows from the well location to a separate central facility for separation and processing.

Electric power for the electrical submersible pump (ESP) is provided by one (1) 295 HP natural gas engine-driven generator. The engine emissions are controlled by the use of a non-selective catalytic reduction (NSCR) catalyst and air-fuel ratio controller (AFRC).

An electric chemical pump exists on site to pump methanol into the well to prevent freezing.

There are fugitive emissions at this location due to potential leaks from valves and connections on the production equipment.

A thermo electric generator is located at the wellhead for cathodic protection.



This is not an exact schematic of the Dry Piney 18 facility. It is a representation of the specific process and production equipment.

LEGEND:

Wellhead ⊗

ESP Power Cable

Underground Line

- Genset

Prepared for:

Wexpro Company

Prepared by:

LESAIR ENVIRONMENTAL, INC.

Dry Piney 18

Sublette County, WY
NWSW Sec 10, T27N, R114W
Latitude: 42.3389°
Longitude: -110.3818°
Elevation: 8,843'

-NOT TO SCALE-

Drawn by: TJS	Date: 06/01/2015
Rev. by:	Date Rev:

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Wyoming Air Quality Application Emission Summary Sheet

Proposed Controlled Production Equipment Emissions

			NOx		CO		SO2		Particulates		VOC		Total HAPs	
Ref No.	Equipment	Note	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 295 HP Waukesha F2895G	a	0.33	1.1	0.65	2.3	0.00	0.0	0.02	0.1	0.20	0.7	0.03	0.1
002	(1) Thermo Electric Generator	b	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
003	Fugitives	c	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.24	1.1	0.02	0.1
	Total		**0.33**	**1.1**	**0.65**	**2.3**	**0.00**	**0.0**	**0.02**	**0.1**	**0.44**	**1.7**	**0.05**	**0.2**

NOTES:

a - Emission factors for NOx, CO and VOC were taken from WAQD BACT for a controlled engine using a catalyst. Other factors were calculated from AP-42 Table 3.2-3. Emissions are based on 7,000 hours per year.

b - Burner emissions based on EPA AP-42 emission factors from Section 1.4, Tables 1.4-1 and 1.4-2 for uncontrolled natural gas burners, the worst case assumption that burners operate 8,760 hours per year, and a fuel heating value of 1619.8 Btu/SCF.

c - Fugitive emissions account for VOC/HAP vapors from connections, valves, tank hatches, and relief vent/valves. Emission Factors derived from Table 2-4, EPA-453/R-95-017.

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Wyoming Air Quality Application Emission Summary Sheet

Proposed Uncontrolled Production Equipment Emissions

			NOx		CO		SO2		Particulates		VOC		Total HAPs	
Ref No.	Equipment	Note	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 295 HP Waukesha F2895G	a	8.45	37.0	5.85	25.6	0.00	0.0	0.02	0.1	0.19	0.9	0.13	0.5
002	(1) Thermo Electric Generator	b	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
003	Fugitives	c	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.24	1.1	0.02	0.1
	Total		**8.45**	**37.0**	**5.85**	**25.6**	**0.00**	**0.0**	**0.02**	**0.1**	**0.44**	**1.9**	**0.15**	**0.6**

NOTES:

a - All uncontrolled emission factors were taken from AP-42 Table 3.2-3. Emissions are based on 8,760 operating hours per year.

b - Burner emissions based on EPA AP-42 emission factors from Section 1.4, Tables 1.4-1 and 1.4-2 for uncontrolled natural gas burners, the worst case assumption that burners operate 8,760 hours per year, and a fuel heating value of 1619.8 Btu/SCF.

c - Fugitive emissions account for VOC/HAP vapors from connections, valves, tank hatches, and relief vent/valves. Emission Factors derived from Table 2-4, EPA-453/R-95-017.

Company Name: **Wexpro Company**
Field: **Dry Piney**
Facility Name: **Dry Piney 18**

Emission Calculation for Natural Gas Fueled Engines (Controlled)

4-Stroke Rich Burn Emissions Calculations

(For Estimating Emissions, using factors supplied by the manufacturer or if no other data is available using AP-42 factors)

Engine Data

Reference No.	Site [1] Rating (HP)	Manufacturer	Model	Annual [2] Op Time (hours)	Fuel Type	Fuel Htg [3] Value (Btu/scf)	Emission Factor Source
001	295	Waukesha	F2895G	7000	Field	1620	Manuf./AP-42

Notes: 1 - 295 Hp site rating (rounded up from 281 Hp) is based on a Waukesha F2895G 8.2:1 natural gas fueled engine in continuous duty and maximum 1,200 RPM (353 HP) derated 3%/1,000 ft above 2,000' asl for a naturally aspirated engine with the actual elevation of the facility at 8,825' asl.
2 - Reduced run hours are requested to have sufficient offsets.
3 - Fuel heating value estimated from Dry Piney Central Facility Gas Analysis

Emission Factors (Uncontrolled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (gm/hp-hr)	CO (gm/hp-hr)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (gm/hp-hr)	HCHO (lb/MMBtu)
001	Waukesha F2895G	295	13.0	9.0	5.88E-04	9.50E-03	0.30	5.00E-02

Notes: 1 - NOx, CO, and VOC emissions were taken from Manufacturer VHP spec sheets for uncontrolled emissions associated with a 3-way catalyst, other EF's were calculated from AP-42 Table 3.2-3.

Emission Factors (Controlled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (g/hp-hr)	CO (g/hp-hr)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (g/hp-hr)	HCHO (g/hp-hr)
001	Waukesha F2895G	295	0.5	1.0	5.88E-04	9.50E-03	0.30	0.05

Notes: 1 - NOx and CO from WAQD PBACT for the non-attainment area, VOC and HCHO emission factors are from the manufacturer. All other EF's were calculated from AP-42 Table 3.2-3.

Source Emissions (Uncontrolled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895G	8.45	37.00	5.85	25.61	0.00	0.01	0.02	0.10	0.19	0.85	0.13	0.55

Notes: * - Emissions based on 8,760 operating hours per year.

Source Emissions (Controlled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895G	0.33	1.14	0.65	2.28	0.00	0.01	0.02	0.08	0.20	0.68	0.03	0.11

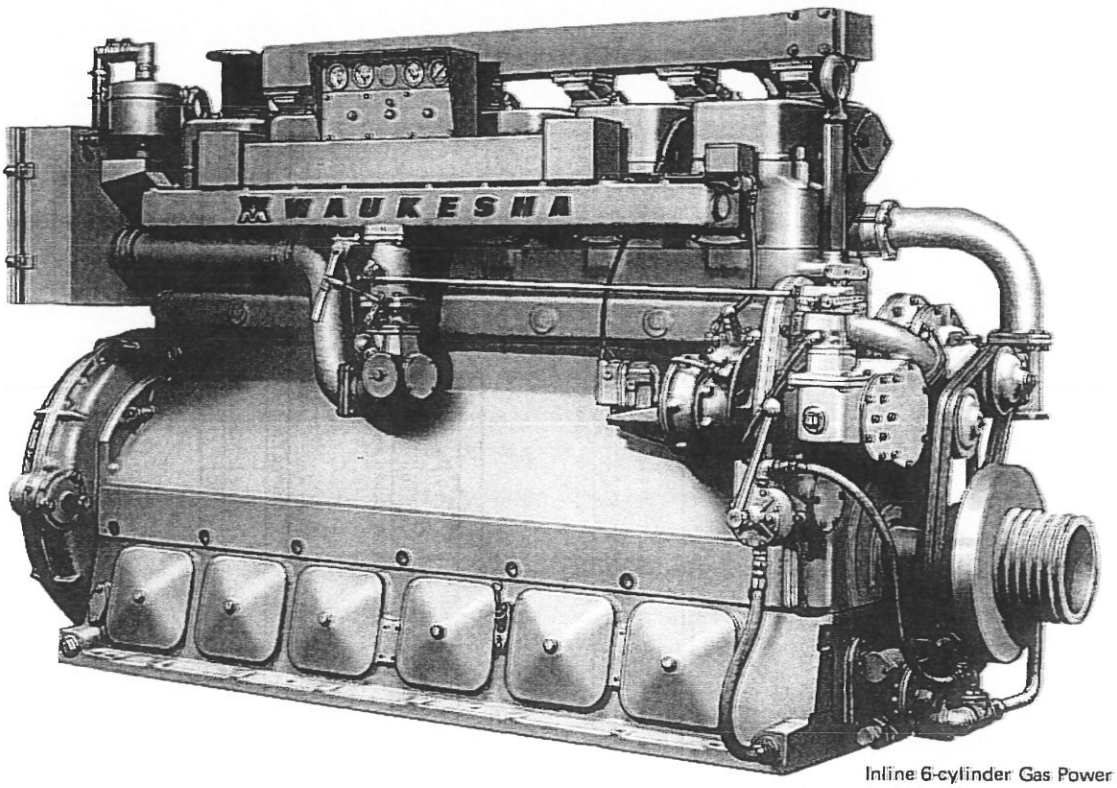
Waukesha Gas Power Units

TURBOCHARGED & NATURALLY ASPIRATED 377 MAXIMUM HP RATING

VHP series

F2895

BULLETIN 5128



Inline 6-cylinder Gas Power Unit, 8-1/2 in. bore, naturally aspirated, Model F2895GU.

PRINCIPAL ENGINE DATA	MODEL F2895GU	MODEL F2895GSIU
Bore and stroke	8.5 In. x 8.5 In. (216 mm x 216 mm)	8.5 In. x 8.5 In. (216 mm x 216 mm)
Number of Cylinders	In-Line 6	In-Line 6
Displacement	2894 Cu. In. (47.4 l)	2894 Cu. In. (47.4 l)
Number of Main Bearings	7	7
Lube Oil System, Capacity		
Engine, not including lines and filters	43 Gals. (162.8 l)	43 Gals. (162.8 l)
Filters (mounted)	9 Gals. (34 l)	9 Gals. (34 l)
Jacket Water System, Capacity		
Engine without radiator	52.5 Gals. (198.7 l)	52.5 Gals. (198.7 l)
Engine with radiator — Cooling System Capacity varies with the size of the radiator required to cool the specified horsepower load. See Radiator Selection Chart, Codes and Dimensions S-5561.		
Weight, naturally aspirated	11200 Lbs. (5080 kg)	
Weight, turbocharged-intercooled		12200 Lbs. (5543 kg)
Weight, FCU gasoline starting unit	550 Lbs. (249 kg)	550 Lbs. (249 kg)

SPECIFICATIONS

Engine — In-line 6 overhead valve, 4-cycle gas engine.

Air Intake System — Cast aluminum intake manifold with dry, panel type air cleaner with rain shield and service indicator.

Barring Device — Hand.

Breather — Closed breather system.

Connecting Rod — Steel forging, angle-split for easy removal through cylinder liner. Serrated split line for precise cap alignment. Rifle drilled for full pressure piston pin lubrication and piston crown cooling.

Crankcase — Rigid one piece ferrous alloy casting with integral cylinder frame. Deep section main bearing caps cross-tie bolted to crankcase for extra rigidity.

Crankshaft — A multi-plane forging of high alloy steel, with precision ground and hardened main bearing and crankpin journals. Dynamically balanced. Generous overlap of main bearing and crankpin journals for increased crankshaft stiffness. Seven large diameter main bearings.

Cylinder Head — An interchangeable deep section casting, one for each cylinder. Four overhead valves per cylinder — dual stellite-faced intake valves and dual stellite-faced Inconel exhaust valves, 30° angle seat. Solid stellite valve seat inserts. Valve lifters with hydraulic push rods. Valve guides of ferrous alloy. Alloy iron rocker arms. Cylinder head gasket has laminated fire ring to seal combustion. Each head casting is rigidly mounted to crankcase by eight (8) 1 inch diameter high strength steel alloy studs.

Cylinder Liner — Removable wet type.

Engine Rotation — Counterclockwise when facing flywheel.

Exhaust System — Cast iron individual water cooled exhaust manifold with 5" (127 mm) vertical rear outlet with flexible stainless steel connection.

Flywheel and Ring Gear — Flywheel machined for Fawick 28CB525 external flange.

Flywheel Housing — SAE No. 00.

Fuel System — Carburetor, 4 in. (102 mm) natural gas updraft type with Fisher gas regulator.

Gear Train — Shaved gear teeth for more uniform loading and reduced gear noises.

Governor — Gear-driven, variable speed, hydraulic type. Friction throttle for speed setting.

Instrumentation Panel — Engine mounted including water temperature, oil temperature, oil pressure and compound pressure gauges, mechanical tachometer, ignition switch. Hourmeter is engine mounted.

Jacket Water System — High capacity, "V" belt driven centrifugal water pump. Thermostatic temperature regulation valves for rapid warm-up and uniform temperature control. Full flow by-pass for most effective coolant circulation during warm-up. Directional flow for controlled cylinder head cooling. Belt driven auxiliary water pump for circulation of water through oil cooler.

Oil Pan — Base type with access openings provide surface area to permit inspection, maintenance and removal of connecting rod and main bearings.

Lube Oil System — Full pressure system with high capacity gear-type pump. Externally adjustable relief valve for accurate pressure control. Full flow through lube oil cooler, shell and tube type. Full flow oil filter. Mounted. Hand primer pump.

Pistons — Heavy section contour ground oil cooled aluminum alloy with ni-resist top ring groove insert and floating piston pins.

Safety Controls — High water temperature, low oil pressure, mechanical fuel shut-off valve. Overspeed shutdown. Manual reset type.

Turbocharged-Intercooled Model — Model F2895GSIU has one (1) exhaust driven turbocharger, power limiter, vertical outlet, and one (1) air-to-water intercooler, gas pressure regulator with 25 lbs. maximum inlet pressure setting balance connections. Flexible exhaust connection. Intercooler water circulation provided by oil cooler pump. 20 psi gas required for full load operation.

Vibration Damper — Viscous type, mounted at front end of crankshaft.

OPTIONAL ACCESSORIES
(Available as original equipment when specified)

Controls — Woodward hydraulic and electric governors. Electric or pneumatic speed modulators. Main bearing high temperature shutdown. Waukesha Engomatic® Control System.

Cooling System — Radiator, heat exchanger, ebullient cooling.

Filter — Sweet or sour natural gas, sewage gas, not mounted.

POWER RATINGS

M = MAXIMUM C = CONTINUOUS

MODEL	COM-PRES-SION RATIO	INTER-COOLER INLET WATER TEMP°F	MAX. TORQUE @RPM	BRAKE HORSEPOWER AT SPEEDS INDICATED													
				600		700		800		900		1000		1100		1200	
				M	C	M	C	M	C	M	C	M	C	M	C	M	C
NATURAL GAS WITHOUT ACCESSORIES																	
F2895G	8.2:1		2349-400	266	200	308	231	347	260	385	289	417	313	446	335	470	353
F2895G†	10:1		2475-700	282	212	330	248	377	283	420	315	461	346	498	374	526	395
F2895GSI	8.2:1	85	3833-*	439	285	512	333	585	380	658	428	731	475	804	523	877	570
F2895GSI	8.2:1	130	3641-*	417	271	486	316	556	361	625	406	695	452	764	497	833	541
NATURAL GAS WITH ACCESSORIES																	
F2895GU	8.2:1		2310-400	261	196	302	227	339	254	375	281	404	303	430	323	450	338
F2895GU†	10:1		2430-700	277	208	324	243	369	277	410	308	448	336	482	362	506	380
F2895GSIU	8.2:1	85	3793-400	433	281	505	328	576	374	647	421	717	466	788	512	858	558
F2895GSIU	8.2:1	130	3609-400	412	268	480	312	547	356	615	400	682	443	748	486	814	529
HD-5 PROPANE WITHOUT ACCESSORIES																	
F2895G	8.2:1		2438-700	278	209	325	244	370	278	411	308	450	338	482	362	505	379
HD-5 PROPANE WITH ACCESSORIES																	
F2895GU	8.2:1		2392-700	273	205	319	239	362	272	401	301	437	328	466	350	485	364

† High Ratio Pistons for Best Fuel Economy. Use Dry Gas Having a High Methane Content.
S = Turbocharged I = Intercooled *Maximum Torque — Any Speed
Performance Curve Supplied on Request
Ratings are based on availability of 1000 BTU HHV gas. For natural gas having less than 1000 BTU HHV, see chart S3955 for percentage loss of horsepower. For sewage gas ratings consult Waukesha Motor Company.
Turbocharged-Intercooled Engines are suitable for operation on 110 Octane (MM) or higher gas. Ratings available for HD-5 Propane 95 Octane (MM) depending upon operating conditions and approved by Waukesha Motor Company.

RATING STANDARDS

MAXIMUM RATING: Maximum HP output of engine which can be demonstrated within 5% at the factory under standard conditions. Engine should not be applied at this rating without prior approval of Waukesha Motor Company, Engineering Division.
Ratings are corrected to sea level barometric pressure of 29.92" hg. and standard temperature of 60 F.
INTERMITTENT RATING: 90% of Maximum Rating. The HP and speed which can be applied under specific conditions of varying load and/or speed. This rating is used for standby, standby-continuous, and peaking applications. Some users prefer to operate for long periods in this higher HP range with full knowledge that this may result in higher maintenance.
CONTINUOUS RATINGS: The HP and speed which can be applied without reduction.
TURBOCHARGED — INTERCOOLED POWER OUTPUT SETTING: Power output will be set to the maximum load requirement at the specified RPM providing this load requirement is within the rating limits of the engine. When load is not specified for the intended speed, the engine will be set for the maximum continuous horsepower rating.
SPECIAL RATINGS: All published ratings of the Waukesha Motor Company are a general guide for a broad range of applications. Other ratings based on specific load applications and economic requirements are available upon receipt at the factory of detailed information.

DEDUCTIONS FOR ALTITUDE AND TEMPERATURE

Type of Engine	RATING		
	Maximum	Intermittent	Continuous
Naturally Aspirated	3% for each 1000' above sea level	3% for each 1000' above 1000' altitude	3% for each 1000' above 2000' altitude
	1% for each 10° over 60 F.	1% for each 10° over 80 F.	1% for each 10° over 100 F.
Turbocharged Intercooled	2% for each 1000' above sea level	2% for each 1000' above 1500' altitude	2% for each 1000' above 3000' altitude
	1% For Each 10° Over 100 F. Ambient Temperature		
	Deduct 1% for each 10° increase in intercooler water above 85 F. 130 F. MAXIMUM		

The manufacturer reserves the right to change or modify, without notice, the design, equipment specifications or ratings as herein set forth without incurring any obligation either with respect to engines previously sold or in the process of construction except where otherwise specifically guaranteed by the manufacturer.

Flywheel and Ring Gear — Flywheel machined to suit requirements.

Fuel Systems — Carburetor, combination HD-5 propane and natural gas, sewage gas.

Pistons — Natural gas, high ratio model F2895GU.

Power Take Off — Stub shaft for direct drive.

Starting — Air, electric, hydraulic, line voltage, model FCU gasoline starting unit.

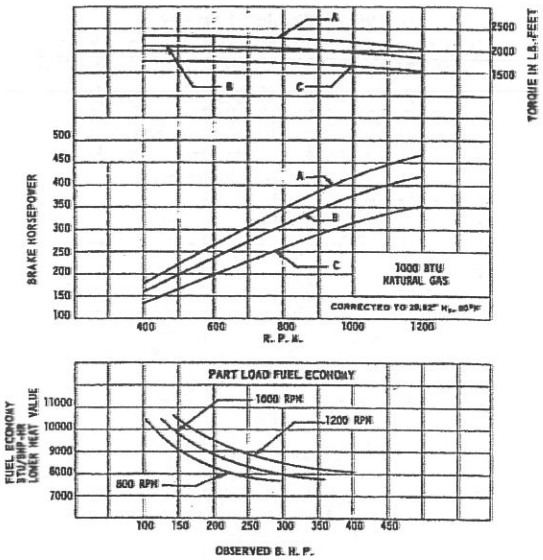
PERFORMANCE CURVES

Curve A: Maximum Rating
Curve B: Intermittent Rating
Curve C: Continuous Rating

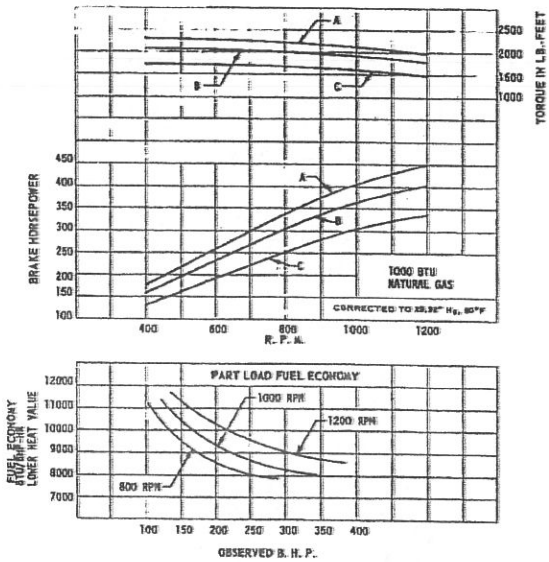
All ratings corrected to 29.92" Hg and 60° F.

Power Unit ratings (right hand column) show deductions for Air Cleaner and 60" diameter, 8 blade fan. All engine and power unit models equipped with 4" updraft carburetor.

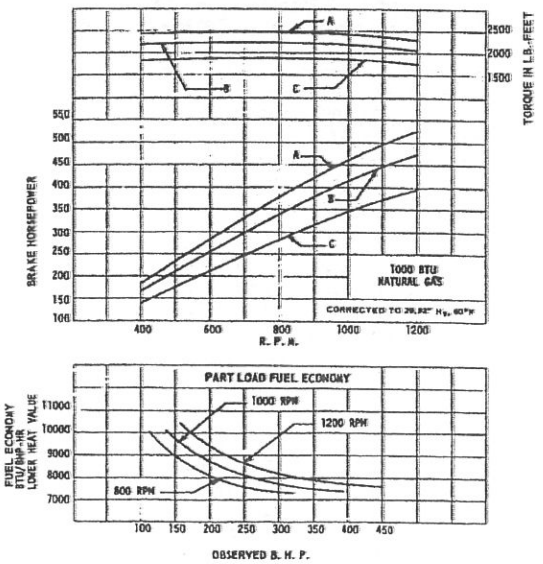
Model F2895G Engine Only
Naturally Aspirated
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



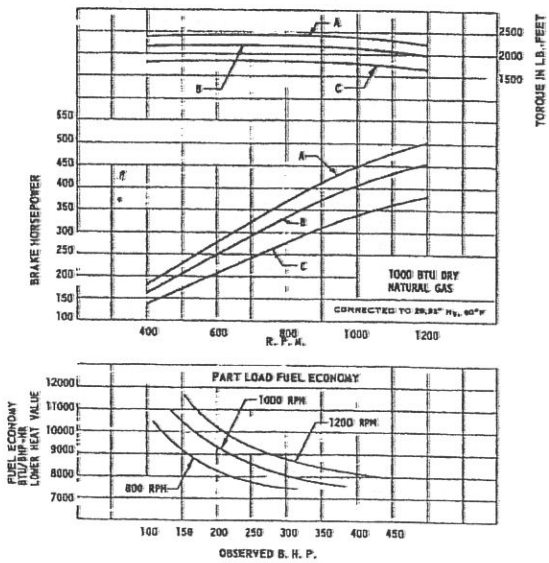
Model F2895GU Power Unit
Naturally Aspirated
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



Model F2895G Engine Only
Naturally Aspirated
10:1 Compression Ratio — 1000 BTU HHV Natural Gas



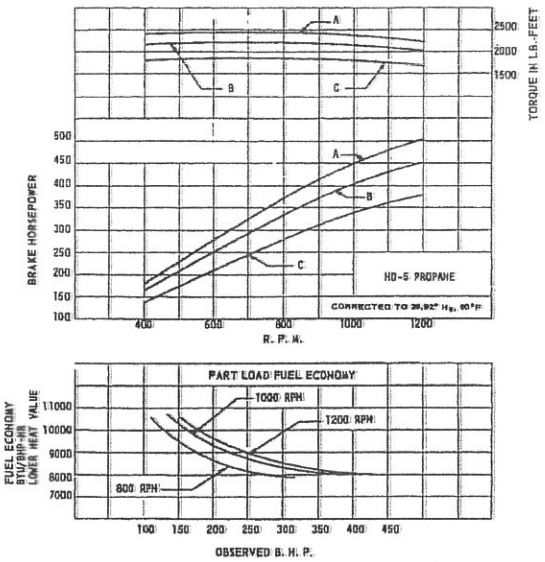
Model F2895GU Power Unit
Naturally Aspirated
10:1 Compression Ratio — 1000 BTU HHV Natural Gas



Model F2895G Engine Only

Naturally Aspirated

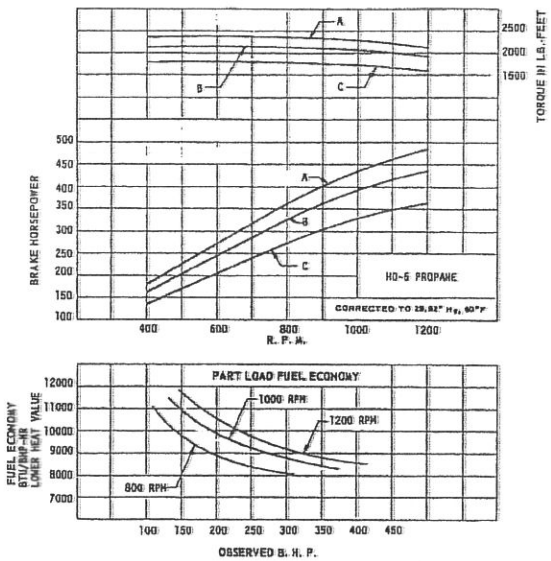
8.2:1 Compression Ratio — HD-5 Propane, 95 Octane (MM)



Model F2895GU Power Unit

Naturally Aspirated

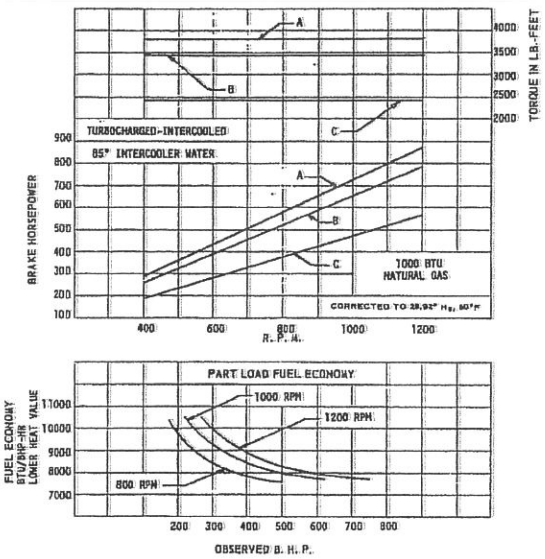
8.2:1 Compression Ratio — HD-5 Propane, 95 Octane (MM)



Model F2895GSI Engine Only

Turbocharged-Intercooled — 85° Intercooler Water

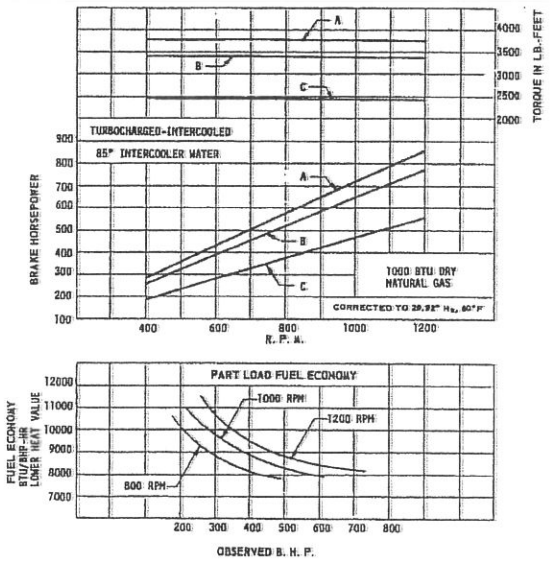
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



Model F2895GSIU Power Unit

Turbocharged-Intercooled — 85° Intercooler Water

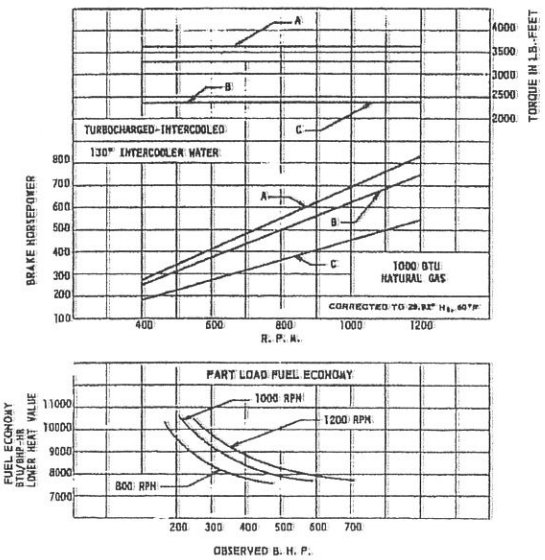
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



Model F2895GSI Engine Only

Turbocharged-Intercooled — 130° Intercooler Water

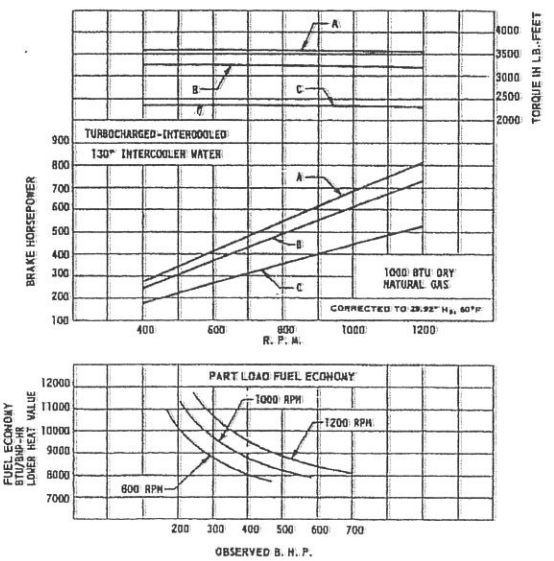
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



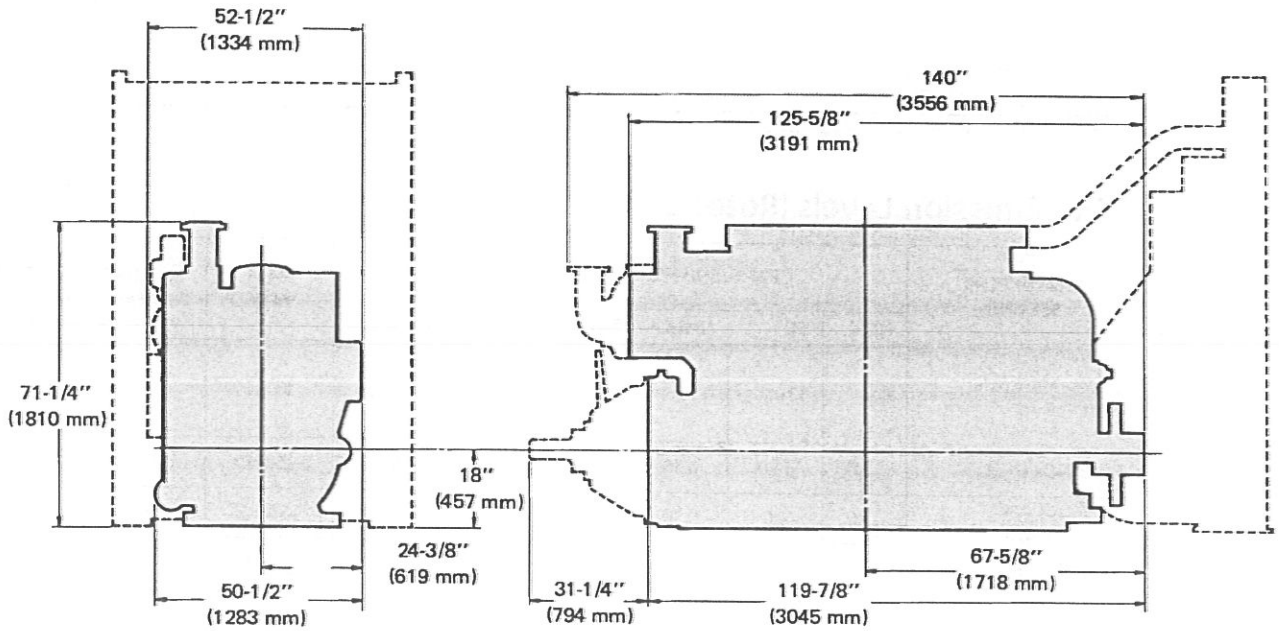
Model F2895GSIU Power Unit

Turbocharged-Intercooled — 130° Intercooler Water

8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



DIMENSIONS



Components and accessory locations and dimensions may vary with service and installation requirements. Dimensions not guaranteed. Detailed print available for layout work.

WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN 53186
Ridgewood, N.J. 07451 Houston, Tex. 77027 Tulsa, Okla. 74105 Downey, Calif. 90240 Anchorage Alas. 99502
A BANGOR PUNTA COMPANY

Bulletin 5128

6-71 Litho in U.S.A.

VHP emPact Catalyst Out Emissions *

MODEL	Catalyst	GRAMS/BHP-HR			
		NOx	CO	THC	NMHC
L5794GSI	Option Code 1004	0.5	1.0	1.3	0.15
	Option Code 1005	0.15	0.3		
L7042GSI S4	Option Code 1004	0.5	1.0	1.6	0.20
	Option Code 1005	0.15	0.3		
L7044GSI	Option Code 1004	0.5	1.0	1.7	0.20
	Option Code 1005	0.15	0.3		

* Emission levels are based on 900 -1200 rpm operation at 75-100% load and require GE-supplied (NSCR) catalyst.

VHP* Engine Out Emission Levels (Rated Load & Speed)

MODEL	CARBURETOR SETTING	GRAMS/BHP-HR				% OBSERVED DRY		MASS AFR[2]	VOLUME AFR[2]	EXCESS AIR RATIO
		NOx[1]	CO	NMHC[4]	THC	CO	O_2			
G, GSI	Lowest Manifold (Best Power)	8.5	32.0	0.35	2.3	1.15	0.30	15.5:1	9.3:1	0.97
	Equal NOx & CO	12.0	12.0	0.35	2.3	0.45	0.30	15.9:1	9.6:1	0.99
	Catalytic Conv. Input (3-way[3])	13.0	9.0	0.30	2.0	0.38	0.30	15.95:1	9.6:1	0.99
	Standard (Best Economy)	22.0	1.5	0.25	1.5	0.02	1.35	17.0:1	10.2:1	1.06
F3514GSI F3524GSI	Catalytic Conv. Input (3-way3)	16.0	13.0	0.20	1.0	0.38	0.30	15.95:1	9.6:1	0.995
L5794GSI#	Catalytic Conv. Input (3-way[3])	14.0	9.0	0.30	2.0	0.38	0.30	15.95:1	9.6:1	0.995
L7044GSI# L7042GSI S4#	Catalytic Conv. Input (3-way[3])	14.0	11.0	0.40	2.5	0.38	0.30	15.95:1	9.6:1	0.995
GL	Standard	1.5	2.65	1.00	5.5	0.06	9.8	28.0:1	16.8:1	1.74
L5774LT	Standard	2.6	2.0	0.60	4.0	0.04	8.0	24.7:1	14.8:1	1.54
L5794LT	Standard	2.6	2.0	0.60	4.0	0.04	7.8	24.5:1	14.7:1	1.52

Models without GE-supplied catalyst included as part of the emPact Emission Control System.

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Deration Calculation Method

Reference No.	Manufact. Rating [1] (Hp)	Manufacturer	Model	Site Elevation (ft)	Ambient Temp [2] (°F)	Derate Factor [3]	Site Rating (Hp)
001	353	Waukesha	F2895G	8,825	100	0.795	281

Notes: 1 - Hp rating comes from manufacturer literature rated at 100% load
2 - Ambient temperature is determined by temperature of the air at the engine air intake (aftercooler), manufacturer data lists this as 130°F, the use of 100°F is viewed as conservative.
3 - Derate factor was determined using Caterpillar's basis of 3%/1,000 ft above 2,000 ft asl for continuous duty engines.

Company Name: **Wexpro Company**
Field: **Dry Piney**
Facility Name: **Dry Piney 18**

Fuel Consumption Calculation

Consumption Calculation Method

Fuel Consumption (MMSCF/yr) = Brake Specific Fuel Use (Btu/bhp-hr) * Annual Operating Hrs (hrs/yr) * Horsepower * 1/Fuel Heating Value (SCF/Btu) * 1 MMSCF/10^6 S

Reference No.	Site [1] Rating (HP)	Manufacturer	Model	Annual [2] Op Time (hours)	Fuel Type	Fuel Htg [3] Value (Btu/scf)	Brake Specific [4] Fuel Use (Btu/bhp-hr)	Fuel Use (MMSCF/yr)
001	295	Waukesha	F2895G	7000	Field	1620	8500	10.84

Notes: 1 - Site Rated Hp was rounded up to 295 from 281 Hp, estimated Hp based on manufactuer information and site conditions.
2 - Reduced run hours to stay in compliance with offset requrements.
3 - Fuel heating value estimated from Dry Piney Central Facility wet gas analysis.
4 - The BSFC of the engine is from manufacturer literature.

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Emission Calculation for External Combustion Sources

AP-42 Calculation Method

(For Estimating Emissions, Using Emission Factors from EPA AP-42, Table 1.4-1 and Table 1.4-2)

Burner Data

Reference No.	Quantity	Fuel Use (SCF/Hr)	Equipment	Annual Op Time (hours)	Fuel Type	Fuel Htg Value (Btu/scf)	Fraction of VOC [1]
002	1	13.0	TE Generator	8760	Field	1620	0.58

1 - Fraction of VOC is derived from the fuel gas analysis (MW_{VOC}/MW_{TOTAL})

Emission Factors

Reference No.	Fuel Use (SCF/Hr)	Emission Factors					
		NOx (Lb/MMFt^3)	CO (Lb/MMFt^3)	SO_2 (Lb/MMFt^3)	PM (Lb/MMFt^3)	TOC [2] (Lb/MMFt^3)	VOC [3] (Lb/MMFt^3)
002	13.0	100.0	84.0	0.6	7.6	11.0	6.4
EF Source		AP-42	AP-42	AP-42	AP-42	AP-42	Estimate

2- Total Organic Compunds (TOC)

3 - VOC emission factor determined by taking TOC factor times fraction of fuel gas that was VOC.

Emissions (Lb/Hr) = E.F. (Lb/MMft^3) * FHV/1020 * Burner Rating (MMbtu/Hr) * 1/1020 * 1 MMft^3/1x10^6 ft^3 * 1x10^6 Btu/MMbtu

Emissions (TPY) = Emissions (Lb/Hr) * Annual Operating Time (Hr/Yr) * 1 ton/2,000 Lb

Source Emissions

Reference No.	Source Emissions									
	NOx		CO		SO_2		PM		VOC	
	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
002	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Fugitives Emission Calculation

Equipment Leak Emission Estimates for Oil and Gas Production Operations

(Emission Factors Derived From Table 2-4, EPA-453/R-95-017, "Protocol for Equipment Leak emission Estimates", November 1995)

Component Type	Equipment Service Category			
	Gas (lbs/hr/component)	Heavy Oil[3] (<20 API Gravity) (lbs/hr/component)	Light Oil (>20 API Gravity) (lbs/hr/component)	Water/Light Oil[2] (lbs/hr/component)
Connectors	4.41E-04	1.65E-05	4.63E-04	2.43E-04
Flanges	8.60E-04	8.60E-07	2.43E-04	6.39E-06
Open-ended Lines	4.41E-03	3.09E-04	3.09E-03	5.51E-04
Pumps	5.29E-03	0.00E+00	2.87E-02	5.29E-05
Valves	9.92E-03	1.85E-05	5.51E-03	2.16E-04
Other[1]	1.94E-02	7.05E-05	1.65E-02	3.09E-02

* - All factors are for total organic compound emission rates (includes non-VOC's such as methane and ethane).
1 - "Other" equipment type includes compressors, pressure relief valves, relief valves, diaphrams, drains, dump arms, hatches, instruments, meters, polished rods and vents.
2 - Water/Light Oil factors apply to water streams in oil service with a water content greater than 50% to 99% For streams with water content greater than 99%, the emission rate is considered negligable.
3 - The emission factor for pumps was not derived in the actual protocol, the factor for "other" has been substituted for completeness.

INPUTS:

1. List the quantity of each type of component in each type of service at the applicant's facility:

Component Type	Equipment Service Category			
	Gas	Heavy Oil (<20 API Gravity)	Light Oil (>20 API Gravity)	Water/Light Oil
Connectors	38.000	0.000	7.000	0.000
Flanges	5.000	0.000	1.000	0.000
Open-ended Lines	5.000	0.000	0.000	0.000
Pumps	0.000	0.000	0.000	0.000
Valves	15.000	0.000	10.000	0.000
Other	2.000	0.000	3.000	0.000

NOTE: The component count is estimated based on an LDAR site-specific count for "Like Kind" facility.

Sample Calculation:

TOC (TPY) = component quantity * component factor * 8,760 hr/yr * 1 ton/2,000 lb.s
VOC (TPY) = TOC * VOC Fraction from gas analysis (wt%)

Component Type	Equipment Service Category			
	Gas (TPY of TOC)	Heavy Oil (<20 API Gravity) (TPY of TOC)	Light Oil (>20 API Gravity) (TPY of TOC)	Water/Light Oil (TPY of TOC)
Connectors	0.073387	0.000000	0.014195	0.000000
Flanges	0.018830	0.000000	0.001062	0.000000
Open-ended Lines	0.096562	0.000000	0.000000	0.000000
Pumps	0.000000	0.000000	0.000000	0.000000
Valves	0.651797	0.000000	0.241406	0.000000
Other	0.169950	0.000000	0.217266	0.000000
TOTAL	**1.010526**	**0.000000**	**0.473929**	**0.000000**
Weight VOC Fraction	0.5825	0.00	1.00	1.00
Weight HAP Fraction	0.0709	0.00	0.033	0.033

Note: The weight fraction for HAPs in light oil service was estimated using Colorado emission factors for flash (Moffat County). EF for n-hexane was used for all other HAPs in Bin C.

TPY VOC	**0.59**	**0.00**	**0.47**	**0.00**
lb/hr VOC	0.13	0.00	0.11	0.00
TPY HAP	**0.07**	**0.00**	**0.02**	**0.00**
lb/hr HAP	0.02	0.00	0.00	0.00

Source	VOC		Total HAPs	
	(lb/hr)	(TPY)	(lb/hr)	(TPY)
Fugitives	**0.24**	**1.06**	**0.02**	**0.09**

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Gas Analysis Calculation Sheet

Based on: **Dry Piney Central Facility Gas Analysis**

							LHV BTU Content		HHV BTU Content	
Component	Mole %	Mole Frac.	Lb/Lb mole	MW	VOC	HAP	Btu/scf	Btu/scf*Mole Frac	Btu/scf	Btu/scf*Mole Frac
Carbon Dioxide	10.3907	0.1039	44.01	4.57			0.0	0.00	0.0	0.00
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00			586.8	0.00	637.1	0.00
Nitrogen	22.6175	0.2262	28.02	6.34			0.0	0.00	0.0	0.00
Methane	34.3748	0.3437	16.04	5.51			909.4	312.60	1010.0	347.19
Ethane	0.9145	0.0091	30.07	0.27			1618.7	14.80	1769.6	16.18
Propane	1.4181	0.0142	44.09	0.63	0.63		2314.9	32.83	2516.1	35.68
Isobutane	2.7479	0.0275	58.12	1.60	1.60		3000.4	82.45	3251.9	89.36
n-butane	7.5950	0.0760	58.12	4.41	4.41		3010.8	228.67	3262.3	247.77
Isopentane	5.0677	0.0507	72.15	3.66	3.66		3699.0	187.45	4000.9	202.75
n-pentane	5.8226	0.0582	72.15	4.20	4.20		3706.9	215.84	4008.9	233.42
Cyclopentane	0.0000	0.0000	70.08	0.00	0.00		3512.2	0.00	3763.4	0.00
n-hexane	3.0454	0.0305	86.18	2.62	2.62	2.62	4404.1	134.12	4750.2	144.66
Cyclohexane	0.3186	0.0032	84.18	0.27	0.27		4179.9	13.32	4481.2	14.28
Other Hexanes	3.3515	0.0335	86.18	2.89	2.89		4392.7	147.22	4744.5	159.01
Heptanes	1.6377	0.0164	100.21	1.64	1.64		5100.3	83.53	5500.4	90.08
Methylcyclohexane	0.1932	0.0019	98.19	0.19	0.19		4863.9	9.40	5215.7	10.08
2,2,4-Trimethylpentane	0.1481	0.0015	114.22	0.17	0.17	0.17	5779.1	8.56	6231.5	9.23
Benzene	0.0123	0.0001	78.11	0.01	0.01	0.01	3591.1	0.44	3741.5	0.46
Toluene	0.0161	0.0002	92.14	0.01	0.01	0.01	4273.7	0.69	4474.5	0.72
Ethylbenzene	0.0024	0.0000	106.17	0.00	0.00	0.00	4970.7	0.12	5221.7	0.13
Xylenes	0.0128	0.0001	106.17	0.01	0.01	0.01	4957.4	0.63	5208.4	0.67
C8+Heavies	0.3131	0.0031	315.00	0.99	0.99		5796.3	18.15	5794.1	18.14
Totals	**100.0000**	**1.0000**		**40.0006**	**23.3016**	**2.8342**		**1490.80**		**1619.80**

Fraction of Vapors that are VOC:	**0.5825**
Fraction of Vapors that are HAP:	**0.0709**
Gas Specific Gravity:	**1.3808**

Lesair Environmental, Inc.
www.lesair.com

QUESTAR APPLIED TECHNOLOGY

1210 D. Street, Rock Springs, Wyoming 82901

(307) 352-7292

LIMS ID:	N/A		Description:	Dry Piney Treater Vent
Analysis Date/Time:	4/30/2010	8:42 AM	Field:	Dry Piney
Analyst Initials:	PRP		ML#:	Wexpro
Instrument ID:	Instrument 1		GC Method:	Quesbtex
Data File:	QPC96.D			
Date Sampled:	4/29/2010			

Component	Mol%	Wt%	LV%
Methane	34.3748	14.0373	26.8067
Ethane	0.9145	0.7000	1.1283
Propane	1.4181	1.5917	1.7988
Isobutane	2.7479	4.0655	4.1382
n-Butane	7.5950	11.2365	11.0231
Neopentane	0.0489	0.0897	0.0862
Isopentane	5.0188	9.2171	8.4568
n-Pentane	5.8226	10.6933	9.7081
2,2-Dimethylbutane	0.0785	0.1723	0.1509
2,3-Dimethylbutane	0.3149	0.6907	0.5939
2-Methylpentane	1.8408	4.0379	3.5163
3-Methylpentane	1.1173	2.4508	2.0985
n-Hexane	3.0454	6.6802	5.7634
Heptanes	2.3260	5.6037	4.4004
Octanes	0.2654	0.7690	0.6121
Nonanes	0.0621	0.1940	0.1486
Decanes plus	0.0008	0.0028	0.0022
Nitrogen	22.6175	16.1276	11.4153
Carbon Dioxide	10.3907	11.6399	8.1522
Oxygen	0.0000	0.0000	0.0000
Hydrogen Sulfide	0.0000	0.0000	0.0000
Total	100.0000	100.0000	100.0000

Global Properties		Units
Gross BTU/Real CF	1636.4	BTU/SCF at 60°F and14.73 psia
Sat.Gross BTU/Real CF	1609.5	BTU/SCF at 60°F and14.73 psia
Gas Compressibility (Z)	0.9896	
Specific Gravity	1.3573	air=1
Avg Molecular Weight	39.287	gm/mole
Propane GPM	0.388648	gal/MCF
Butane GPM	3.285212	gal/MCF

Component	Mol%	Wt%	LV%
Benzene	0.0123	0.0246	0.0159
Toluene	0.0161	0.0378	0.0248
Ethylbenzene	0.0024	0.0065	0.0043
M&P Xylene	0.0105	0.0283	0.0186
O-Xylene	0.0023	0.0061	0.0040
2,2,4-Trimethylpentane	0.1481	0.4306	0.3425
Cyclopentane	0.0000	0.0000	0.0000
Cyclohexane	0.3186	0.6824	0.4991
Methylcyclohexane	0.1932	0.4828	0.3574
Description:	Dry Piney Treater Vent		

GRI GlyCalc Information

Component	Mol%	Wt%	LV%
Carbon Dioxide	10.3907	11.6399	8.1522
Hydrogen Sulfide	0.0000	0.0000	0.0000
Nitrogen	22.6175	16.1276	11.4153
Methane	34.3748	14.0373	26.8067
Ethane	0.9145	0.7000	1.1283
Propane	1.4181	1.5917	1.7988
Isobutane	2.7479	4.0655	4.1382
n-Butane	7.5950	11.2365	11.0231
Isopentane	5.0677	9.3068	8.5430
n-Pentane	5.8226	10.6933	9.7081
Cyclopentane	0.0000	0.0000	0.0000
n-Hexane	3.0454	6.6802	5.7634
Cyclohexane	0.3186	0.6824	0.4991
Other Hexanes	3.3515	7.3517	6.3596
Heptanes	1.6377	3.9455	3.1607
Methylcyclohexane	0.1932	0.4828	0.3574
2,2,4 Trimethylpentane	0.1481	0.4306	0.3425
Benzene	0.0123	0.0246	0.0159
Toluene	0.0161	0.0378	0.0248
Ethylbenzene	0.0024	0.0065	0.0043
Xylenes	0.0128	0.0344	0.0226
C8+ Heavies	0.3131	0.9249	0.7360
Subtotal	100.0000	100.0000	100.0000
Oxygen	0.0000	0.0000	0.0000
Total	100.0000	100.0000	100.0000

Company Name: **Wexpro Company**
Facility Name: **Dry Piney 18**

Attachment C

Baseline Emissions and Offsets Demonstration

Prepared for:
Wexpro Company

Prepared by:
Lesair Environmental, Inc.
www.Lesair.com

SUBLETTE COUNTY PERMITTED EMISSIONS April 1, 2008 - PRESENT

company	field	facility	date of permit application	date of receipt	permit/waiver / AP #	Equipment Design / Current Actual Emissions (TPY)		Baseline Emissions (TPY)		increase/decrease from baseline emissions (TPY)		VOC Offset Bank	NOx Offset Bank	Reason for Change
						VOC	NO_x	VOC	NO_x	VOC	NO_x			
Wexpro	Dry Piney	Dry Piney 35	10/22/2010			19.8	0.7	30.4	0.7	-10.6	0	-10.6	0.0	Swapped Kimray 4015 for crippled 2015 pump, accounted for additional HT pump
Wexpro	Dry Piney	Dry Piney Central Facility	4/3/2012			22.2	2.6	21.2	3.3	1	-0.7	1.5	-0.7	Equipment changes
Wexpro	Dry Piney	Dry Piney 20	6/7/2015			2.1	1.7	1.9	0.7	0.2	1	0.3	1.1	Proposed replacement engine; offsets from actual 2006/2007 hrs and test emissions
Wexpro	Dry Piney	Dry Piney 18	6/7/2015			1.7	1.1	1.5	1.5	0.2	-0.4	0.3	-0.4	Emissions reductions on existing engine; offsets from actual 2006/2007 hrs and test emissions
		Wexpro TOTAL				45.8	6.1	55.0	6.2	-9.2	-0.1	-8.50	0.00	

Notes: DP 20 Annual Run Hours based on 7,100 hours per year
DP 18 Annual Run Hours based on 7,000 hours per year

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Wyoming Air Quality Application Emission Summary Sheet - Baseline Emissions Estimation

2008 Baseline Controlled Production Equipment Emissions

			NOx		CO		SO2		Particulates		VOC		Total HAPs	
Ref No.	Equipment	Note	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 254 HP Caterpillar G398SITA Genset	a	0.42	1.5	0.42	1.5	0.00	0.0	0.02	0.1	0.11	0.4	0.03	0.1
002	(1) Thermo Electric Generator	b	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
003	Fugitives	c	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.24	1.1	0.02	0.1
	Total		**0.42**	**1.5**	**0.42**	**1.5**	**0.00**	**0.0**	**0.02**	**0.1**	**0.35**	**1.5**	**0.05**	**0.2**

NOTES:

a - Emission factors for Nox and CO are average values from actual tests in 2006/2007. VOC emissions were from WAQD Permit CT-3335A. Other factors were calculated from AP-42 Table 3.2-3. Engine emissions ar based on the actual average 2006/2007 run hours of 7323 hours.

b - Burner emissions based on EPA AP-42 emission factors from Section 1.4, Tables 1.4-1 and 1.4-2 for uncontrolled natural gas burners, the worst case assumption that burners operate 8,760 hours per year, and a fuel heating value of 1619.8 Btu/SCF. Thermoelectric generator has existed at this location since 2006

c - Fugitive emissions account for VOC/HAP vapors from connections, valves, tank hatches, and relief vent/valves. Emission Factors derived from Table 2-4, EPA-453/R-95-017.

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Wyoming Air Quality Application Emission Summary Sheet - Baseline Emissions Estimation

2008 Baseline Uncontrolled Production Equipment Emissions

			NOx		CO		SO2		Particulates		VOC		Total HAPs	
Ref No.	Equipment	Note	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 254 HP Caterpillar G398SITA Genset	a	4.77	17.5	8.03	29.4	0.00	0.0	0.02	0.1	0.06	0.2	0.04	0.2
002	(1) Thermo Electric Generator	b	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
003	Fugitives	c	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.24	1.1	0.02	0.1
	Total		**4.77**	**17.5**	**8.03**	**29.4**	**0.00**	**0.0**	**0.02**	**0.1**	**0.31**	**1.3**	**0.06**	**0.2**

NOTES:

a - The engine NOx, CO, VOC emission factors are from manuacturer documentation for an uncontrolled engine, other EF's were taken from AP-42 Table 3.2-3. Engine emissions are based on the actual average 2006/2007 run hours of 7323 hours.

b - Burner emissions based on EPA AP-42 emission factors from Section 1.4, Tables 1.4-1 and 1.4-2 for uncontrolled natural gas burners, the worst case assumption that burners operate 8,760 hours per year, and a fuel heating value of 1619.8 Btu/SCF. Thermoelectric generator has existed at this location since 2006

c - Fugitive emissions account for VOC/HAP vapors from connections, valves, tank hatches, and relief vent/valves. Emission Factors derived from Table 2-4, EPA-453/R-95-017.

Company Name: **Wexpro Company**
Field: **Dry Piney**
Facility Name: **Dry Piney 18**

Baseline Emission Calculation for Natural Gas Fueled Engines (Controlled)

2006/2007 Baseline Emissions for Offsets Determination

(For Estimating Emissions, using factors supplied by the manufacturer or if no other data is available using AP-42 factors)

Engine Data

Reference No.	Site[1] Rating (HP)	Manufacturer	Model	Annual[2] Op Time (hours)	Fuel Type	Fuel Htg[3] Value (Btu/scf)	Emission Factor Source	Fuel[4] Consumption (MMSCF/yr)
001	254	Waukesha	F2895G	7323	Field	1620	Manuf./AP-42	9.76

Notes: 1 - Site rating is based on the horsepower rating of the engine from permit CT-3335A (based on ESP load from 03/2002 submittal to WAQD).
2 - Run hours based on 2006/2007 average hours of operation.
3 - Fuel heating value estimated from Dry Piney Central Facility Gas Analysis
4 - Engine fuel consumption based on 254 Hp, 7323 hours of operation and BSFC 8500 Btu/Hp-Hr.

Emission Factors (Uncontrolled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (lb/MMBtu)	CO (lb/MMBtu)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (lb/MMBtu)	HCHO (lb/MMBtu)
001	Waukesha F2895G	254	2.21E+00	3.72E+00	5.88E-04	9.50E-03	2.96E-02	2.05E-02

Notes: 1 - All uncontrolled emission factors are based on AP-42 Table 3.2-3

Emission Factors (Controlled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (g/hp-hr)	CO (g/hp-hr)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (g/hp-hr)	HCHO (g/hp-hr)
001	Waukesha F2895G	254	0.75	0.75	5.88E-04	9.50E-03	0.20	0.05

Notes: 1 - NOx and CO emission factors are from the average of engine tests performed in 2006 and 2007.
2 - VOC and HCHO emission factors are those listed in Permit CT-3335A.
All other EF's were calculated from AP-42 Table 3.2-3.

Baseline Source Emissions (Uncontrolled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895G	4.77	17.47	8.03	29.41	0.00	0.00	0.02	0.08	0.06	0.23	0.04	0.16

Baseline Source Emissions (Controlled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895G	0.42	1.54	0.42	1.54	0.00	0.00	0.02	0.08	0.11	0.41	0.03	0.10

LESAIR ENVIRONMENTAL, INC.

June 8, 2015

RECEIVED
JUN 10 2015
AIR QUALITY DIVISION

Ms. Alicia Boltz
Air Quality Engineer
Wyoming Division of Environmental Quality
122 W. 25th Street
Herschler Building, 2E
Cheyenne, WY 82002

Subject: A0000684; Dry Piney 18 Engine Driven Generator Replacement Incomplete Application Letter Follow-up Information

Ms. Boltz,

As per the telephone conversation between you, Cole Anderson and myself on May 4, 2015, please find attached the revised application information for the Dry Piney 18 engine replacement application (A0000684). This letter is in response to three (3) findings (two noted in the incomplete application letter dated March 25, 2015 and one discovered during the May 4 telephone call):

1. Per your request, include an IMPACT "Emission Information" form for each source.

2. Per the Wyoming Air Quality Division's baseline process, Wexpro is utilizing the average actual run hours of the engine during the 24 month period of 2006/2007 to calculate the baseline emissions used in the emissions offset process.

3. The NSCR catalyst is required to meet a Wyoming PBACT control standard of 0.5 gm/hp-hr for NOx instead of the 0.7 gm/hp-hr value in the initial application.

To ensure the accurate replacement of the corrected or additional information, Lesair has provided a complete application except for the IMPACT "Cover Sheet" form. If you require any more information or have further questions please feel free to contact Mr. Tom Bradley (Wexpro Company) at (801) 324-3062 or via email at Tom.Bradley@questar.com. You may also contact me at (303) 904-2525 or via email at TySmith@Lesair.com.

Sincerely,

Ty J. Smith
Sr. Project Manager
Lesair Environmental, Inc.

Enclosure:

cc: Mr. Tom Bradley (Wexpro Company)

Company Name: **Wexpro Company**
Facility Name: **Dry Piney 18**

Attachment A

WAQD IMPACT Forms

Prepared for:
Wexpro Company

Prepared by:
Lesair Environmental, Inc.
www.Lesair.com

Specific Emission Unit Attributes:

Engine

Company Equipment ID:
Company Equipment Description: (1) 295 HP Waukesha

Operating Status: Operating
Initial Construction Commencement Date: 11/1/1980
Initial Operation Commencement Date: 11/1/1980
Most Recent Construction/ Modification Commencement Date: Pending

Most Recent Operation Commencement Date: Pending

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Other

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New catalyst being installed and emissions reductions claimed

Name Plate Rating: 353 Units: hp
Site Rating: 295 Units: hp
Primary Fuel Type: Field Gas
Secondary Fuel Type:
Model Name and Number: Waukesha
Engine Type: 4 Stroke Rich Burn
Serial Number Tracking Table:
Serial Number: 354033 Order Date:
Manufacturer Name: Waukesha
Construction/Installation Commencement Date: 11/1/1980
Operation Commencement/ Start-up Date: 11/1/1980
Manufacture Date: pre-1980
Btu Content: 1619.8 Units: BTU/scf
Fuel Sulfur Content: 0 Units:
Type of Service: Generator

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

2-02-002-54

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24
Hours/year: 8424

Control Equipment: Yes

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: NOx, CO, VOC

Proposed BACT: NSCR Catalyst with AFR Controller

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: Subpart ZZZZ

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Revised 11/3/2014

Control Equipment:

Catalytic NOx Control Technology

Manufacturer: _____ Date Installed: Pending

Model Name and Number: _____ Company Control Equipment ID: _____

Company Control Equipment Description: NSCR catalyst

Pollutant(s) Controlled:	☑ CO	☑ NOx	☐ Pb	☐ SO2	☑ VOC	☐ PM	
☐ PM (FIL)	☐ PM Condensible	☐ PM 10 (FIL)		☐ PM 2.5 (FIL)		☐ PM 10	☐ PM 2.5
☐ Other							

NOTE: The following fields require numeric values unless otherwise denoted with an asterisk*

Design Control Efficiency (%): >95% Capture Efficiency (%): 100

Operating Control Efficiency (%): 99%

Catalytic Reduction Type:* Nonselective Catalytic

Reagent Type: _____

Reagent Injection Rate- specify units: _____

Reagent Slip Concentration (ppbv): _____

Reagent Slip Concentration % O2: _____

Inlet Gas Flow Rate (acfm): 2017

Inlet Gas Temp (F): 988 Outlet Gas Temp (F): 1038

Air Fuel Ratio Controller:* Yes

☑ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other emission units that are also vented to this control equipment:* _____

List all release point IDs associated with this control equipment:* _____

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	Insignificant	Insig	NA	Insig	Insig	NA
2.)	PM #10 microns in diameter (PE/PM10)	Insignificant	Insig	NA	Insig	Insig	NA
3.)	PM #2.5 microns in diameter (PE/PM2.5)	Insignificant	Insig	NA	Insig	Insig	NA
4.)	Sulfur dioxide (SO2)	Insignificant	NA	NA	NA	NA	NA
5.)	Nitrogen Oxides (NOx)	58.30	0.5	gm/Hp-hr	0.33	1.37	PBACT
6.)	Carbon monoxide (CO)	4.11	1.0	gm/Hp-hr	0.65	2.74	NSCR
7.)	Volatile organic compounds (VOC)	0.79	0.2	gm/Hp-hr	0.13	0.55	NSCR
8.)	Lead (Pb)	NA	NA	NA	NA	NA	NA
9.)	Total Hazardous Air Pollutants (HAPs)	0.50	0.05	gm/Hp-hr	0.12	0.50	NSCR
10.)	Fluoride (F)	NA	NA	NA	NA	NA	NA
11.)	Hydrogen Sulfide (H2S)	NA	NA	NA	NA	NA	NA
12.)	Mercury (Hg)	NA	NA	NA	NA	NA	NA
13.)	Total Reduced Sulfur (TRS)	NA	NA	NA	NA	NA	NA
14.)	Sulfuric Acid Mist (SAM)	NA	NA	NA	NA	NA	NA

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)	Formaldehyde	0.50	0.05		0.03	0.14	
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Revised 1/22/2015

Specific Emission Unit Attributes:

Electric Generating Unit

Company Equipment ID:
Company Equipment Description: Thermoelectric Generator

Operating Status: Operating
Initial Construction Commencement Date: 9/10/2006
Initial Operation Commencement Date: 9/10/2006
Most Recent Construction/ Modification Commencement Date: 9/10/2006

Most Recent Operation Commencement Date: 9/10/2006

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Modification

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

Emissions reductions are being claimed, facility being re-permitted through IMPACT

Unit Type: Other
Heat Input Rating (MMBtu/hr): 0.02
Primary Fuel Type: Field Gas
Secondary Fuel Type:
Manufacturer Name: Global
Model Name and Number: CP5120N
Btu Content: 1619.8 Units: BTU/scf
Fuel Sulfur Content: 0 Units: %
Net Electrical Output (MW): 0.00012
Gross Electrical Output (MW): 0.00012

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-99

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment: NA

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	Insignificant	Insig	NA	Insig	Insig	NA
2.)	PM #10 microns in diameter (PE/PM10)	Insignificant	Insig	NA	Insig	Insig	NA
3.)	PM #2.5 microns in diameter (PE/PM2.5)	Insignificant	Insig	NA	Insig	Insig	NA
4.)	Sulfur dioxide (SO2)	Insignificant	NA	NA	NA	NA	NA
5.)	Nitrogen Oxides (NOx)	Insignificant	Insig	NA	Insig	Insig	NA
6.)	Carbon monoxide (CO)	Insignificant	Insig	NA	Insig	Insig	NA
7.)	Volatile organic compounds (VOC)	Insignificant	Insig	NA	Insig	Insig	NA
8.)	Lead (Pb)	NA	NA	NA	NA	NA	NA
9.)	Total Hazardous Air Pollutants (HAPs)	Insignificant	Insig	NA	Insig	Insig	NA
10.)	Fluoride (F)	NA	NA	NA	NA	NA	NA
11.)	Hydrogen Sulfide (H2S)	NA	NA	NA	NA	NA	NA
12.)	Mercury (Hg)	NA	NA	NA	NA	NA	NA
13.)	Total Reduced Sulfur (TRS)	NA	NA	NA	NA	NA	NA
14.)	Sulfuric Acid Mist (SAM)	NA	NA	NA	NA	NA	NA

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Specific Emission Unit Attributes:

Fugitives

Company Equipment ID:

Company Equipment Description: Fugitive Emissions

Operating Status: Operating

Initial Construction Commencement Date: 10/15/1970

Initial Operation Commencement Date: 10/15/1970

Most Recent Construction/ Modification Commencement Date: 10/15/1970

Most Recent Operation Commencement Date: 10/15/1970

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Modification

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

Emissions reductions are being claimed, facility being re-permitted through IMPACT

Type of Fugitive Emission: Fugitive Leaks at O&G

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-99

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 8760

Control Equipment: NA

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	NA	NA	NA	NA	NA	NA
2.)	PM #10 microns in diameter (PE/PM10)	NA	NA	NA	NA	NA	NA
3.)	PM #2.5 microns in diameter (PE/PM2.5)	NA	NA	NA	NA	NA	NA
4.)	Sulfur dioxide (SO2)	NA	NA	NA	NA	NA	NA
5.)	Nitrogen Oxides (NOx)	NA	NA	NA	NA	NA	NA
6.)	Carbon monoxide (CO)	NA	NA	NA	NA	NA	NA
7.)	Volatile organic compounds (VOC)	1.06	1.06	TPY	0.24	1.06	Table 2-4, EPA-453/R-95-017
8.)	Lead (Pb)	NA	NA	NA	NA	NA	NA
9.)	Total Hazardous Air Pollutants (HAPs)	Insignificant	Insig	NA	Insig	Insig	Table 2-4, EPA-453/R-95-017
10.)	Fluoride (F)	NA	NA	NA	NA	NA	NA
11.)	Hydrogen Sulfide (H2S)	NA	NA	NA	NA	NA	NA
12.)	Mercury (Hg)	NA	NA	NA	NA	NA	NA
13.)	Total Reduced Sulfur (TRS)	NA	NA	NA	NA	NA	NA
14.)	Sulfuric Acid Mist (SAM)	NA	NA	NA	NA	NA	NA

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

Pollutants:		Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards: Potential to Emit (PTE)	Efficiency Standards: Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Revised 11/3/2014

Release Point Information:

Complete the table below for ***each*** release point. Please include release point information for each emission unit. Multiple attachments may be necessary. A release point is a point at which emissions from an emission unit are released into the ambient (outside)air. List each individual release point on a separate pair of lines (release point ID and description). ***For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)***

Stack Release Point Information		
Company Release Point ID:	Release Point Type:	Vertical
Waukesha F2895G	Release Point Latitude:	42.33888
	Release Point Longitude:	-110.38180
Company Release Point Description:	Base Elevation (ft):	8,825
Engine driven generator for purposes of power supply to equipment on location.	Stack Height (ft):	14
	Stack Diameter (ft):	0.67
	Exit Gas Velocity (ft/s):	41.27
	Exit Gas Temp (F):	892
	Exit Gas Flow Rate (acfm):	2476
Company Release Point ID:	Release Point Type:	Vertical
Thermoelectric Generator	Release Point Latitude:	42.33888
	Release Point Longitude:	-110.38180
Company Release Point Description:	Base Elevation (ft):	8,825
	Stack Height (ft):	NA
	Stack Diameter (ft):	NA
	Exit Gas Velocity (ft/s):	NA
	Exit Gas Temp (F):	NA
	Exit Gas Flow Rate (acfm):	NA
Company Release Point ID:	Release Point Type:	
	Release Point Latitude:	
	Release Point Longitude:	
Company Release Point Description:	Base Elevation (ft):	
	Stack Height (ft):	
	Stack Diameter (ft):	
	Exit Gas Velocity (ft/s):	
	Exit Gas Temp (F):	
	Exit Gas Flow Rate (acfm):	
Company Release Point ID:	Release Point Type:	
	Release Point Latitude:	
	Release Point Longitude:	
Company Release Point Description:	Base Elevation (ft):	
	Stack Height (ft):	
	Stack Diameter (ft):	
	Exit Gas Velocity (ft/s):	
	Exit Gas Temp (F):	
	Exit Gas Flow Rate (acfm):	

Revised 11/3/2014

Complete the table below for each fugitive (area, volume, line) release point. List each individual release point on a separate line.

Fugitive Release Point Information		
Company Release Point ID:	Release Point Latitude:	42.33888
Fugitives	Release Point Longitude:	-110.38180
	Release Height (ft):	NA
Company Release Point Description:		
Fugitive leaks from equipment on location (wellhead, genset)		
Company Release Point ID:	Release Point Latitude:	
	Release Point Longitude:	
	Release Height (ft):	
Company Release Point Description:		
Company Release Point ID:	Release Point Latitude:	
	Release Point Longitude:	
	Release Height (ft):	
Company Release Point Description:		
Company Release Point ID:	Release Point Latitude:	
	Release Point Longitude:	
	Release Height (ft):	
Company Release Point Description:		

Company Name: **Wexpro Company**
Facility Name: **Dry Piney 18**

Attachment B

Supporting Emissions Calculations

Prepared for:
Wexpro Company

Prepared by:
Lesair Environmental, Inc.
www.Lesair.com

Proposed Process Description

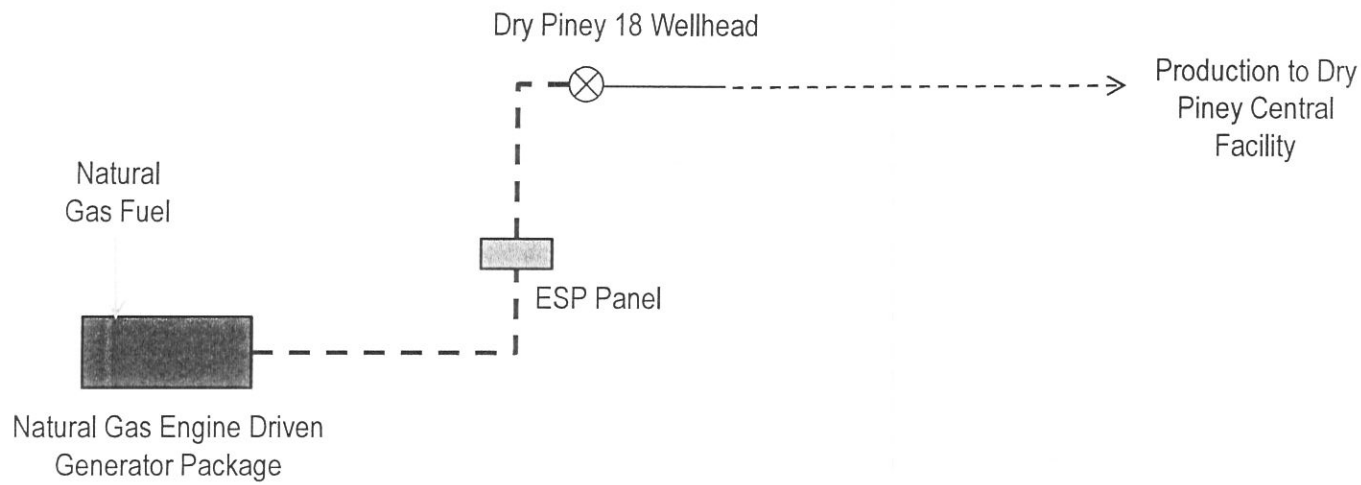
The commingled fluid stream (containing natural gas, condensate and produced water) is pumped from the well by use of an electric submersible pump. The comingled stream flows from the well location to a separate central facility for separation and processing.

Electric power for the electrical submersible pump (ESP) is provided by one (1) 295 HP natural gas engine-driven generator. The engine emissions are controlled by the use of a non-selective catalytic reduction (NSCR) catalyst and air-fuel ratio controller (AFRC).

An electric chemical pump exists on site to pump methanol into the well to prevent freezing.

There are fugitive emissions at this location due to potential leaks from valves and connections on the production equipment.

A thermo electric generator is located at the wellhead for cathodic protection.



This is not an exact schematic of the Dry Piney 18 facility. It is a representation of the specific process and production equipment.

LEGEND:

Wellhead ⊗

ESP Power Cable

Underground Line

- Genset

Prepared for:

Wexpro Company

Prepared by:

LESAIR ENVIRONMENTAL, INC.

Dry Piney 18

Sublette County, WY
NWSW Sec 10, T27N, R114W
Latitude: 42.3389°
Longitude: -110.3818°
Elevation: 8,843'

-NOT TO SCALE-

Drawn by: TJS	Date: 06/01/2015
Rev. by:	Date Rev:

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Wyoming Air Quality Application Emission Summary Sheet

Proposed Controlled Production Equipment Emissions

			NOx		CO		SO2		Particulates		VOC		Total HAPs	
Ref No.	Equipment	Note	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 295 HP Waukesha F2895G	a	0.33	1.37	0.65	2.74	0.00	0.01	0.02	0.10	0.13	0.55	0.03	0.14
002	(1) Thermo Electric Generator	b	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
003	Fugitives	c	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	1.06	0.02	0.09
	Total		**0.33**	**1.38**	**0.65**	**2.75**	**0.00**	**0.01**	**0.02**	**0.10**	**0.37**	**1.61**	**0.05**	**0.22**

NOTES:

a - Emission factors for NOx, CO and VOC were taken from WAQD BACT for a controlled engine using a catalyst. Other factors were calculated from AP-42 Table 3.2-3. Emissions are based on 8424 hours per year.

b - Burner emissions based on EPA AP-42 emission factors from Section 1.4, Tables 1.4-1 and 1.4-2 for uncontrolled natural gas burners, the worst case assumption that burners operate 8,760 hours per year, and a fuel heating value of 1619.8 Btu/SCF.

c - Fugitive emissions account for VOC/HAP vapors from connections, valves, tank hatches, and relief vent/valves. Emission Factors derived from Table 2-4, EPA-453/R-95-017.

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Wyoming Air Quality Application Emission Summary Sheet

Proposed Uncontrolled Production Equipment Emissions

			NOx		CO		SO2		Particulates		VOC		Total HAPs	
Ref No.	Equipment	Note	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 295 HP Waukesha F2895G	a	13.84	58.30	0.97	4.11	0.00	0.01	0.02	0.10	0.19	0.79	0.12	0.50
002	(1) Thermo Electric Generator	b	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
003	Fugitives	c	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	1.06	0.02	0.09
	Total		**13.84**	**58.30**	**0.98**	**4.11**	**0.00**	**0.01**	**0.02**	**0.10**	**0.43**	**1.86**	**0.14**	**0.59**

NOTES:

a - All uncontrolled emission factors were taken from AP-42 Table 3.2-3. Emissions are based on 8424 hours per year.

b - Burner emissions based on EPA AP-42 emission factors from Section 1.4, Tables 1.4-1 and 1.4-2 for uncontrolled natural gas burners, the worst case assumption that burners operate 8,760 hours per year, and a fuel heating value of 1619.8 Btu/SCF.

c - Fugitive emissions account for VOC/HAP vapors from connections, valves, tank hatches, and relief vent/valves. Emission Factors derived from Table 2-4, EPA-453/R-95-017.

Company Name: **Wexpro Company**
Field: **Dry Piney**
Facility Name: **Dry Piney 18**

Emission Calculation for Natural Gas Fueled Engines (Controlled)

4-Stroke Rich Burn Emissions Calculations

(For Estimating Emissions, using factors supplied by the manufacturer or if no other data is available using AP-42 factors)

Engine Data

Reference No.	Site [1] Rating (HP)	Manufacturer	Model	Annual [2] Op Time (hours)	Fuel Type	Fuel Htg [3] Value (Btu/scf)	Emission Factor Source
001	295	Waukesha	F2895G	8424	Field	1620	Manuf./AP-42

Notes: 1 - 281 (rounded up to 295) Hp Site rating is based on a Waukesha F2895G 8.2:1 natural gas fueled engine in continuous duty and maximum 1,200 RPM (353 HP) derated 3%/1,000 ft above 1,000' asl for a naturally aspirated engine with the actual elevation of the facility at 8,825' asl.
2 - Run hours are the requested annual operating hours
3 - Fuel heating value estimated from Dry Piney Central Facility Gas Analysis

Emission Factors (Uncontrolled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (gm/hp-hr)	CO (gm/hp-hr)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (gm/hp-hr)	HCHO (lb/MMBtu)
001	Waukesha F2895G	295	21.3	1.5	5.88E-04	9.50E-03	0.29	5.00E-02

Notes: 1 - NOx, CO, and VOC emissions were taken from Manufacturer spec sheets for uncontrolled emissions, other EF's were calculated from AP-42 Table 3.2-3.

Emission Factors (Controlled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (g/hp-hr)	CO (g/hp-hr)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (g/hp-hr)	HCHO (g/hp-hr)
001	Waukesha F2895G	295	0.5	1.0	5.88E-04	9.50E-03	0.20	0.05

Notes: 1 - NOx, CO, VOC emission factors are from catalyst sizing specifications for this engine. All other EF's were calculated from AP-42 Table 3.2-3.

Source Emissions (Uncontrolled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895G	13.84	58.30	0.97	4.11	0.00	0.01	0.02	0.10	0.19	0.79	0.12	0.50

Source Emissions (Controlled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895G	0.33	1.37	0.65	2.74	0.00	0.01	0.02	0.10	0.13	0.55	0.03	0.14

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Deration Calculation Method

Reference No.	Manufact. Rating [1] (HP)	Manufacturer	Model	Site Elevation (ft)	Ambient Temp [2] (°F)	Derate Factor [3]	Site Rating [4] (hp)
001	353	Waukesha	F2895G	8,825	100	0.795	280.7

Notes: 1 - HP rating comes from manufacturer literature rated at 100% load
2 - Ambient temperature is determined by temperature of the air at the engine air intake (aftercooler), manufacturer data lists this as 130°F, the use of 100°F is viewed as conservative.
3 - Derate factor was determined using Caterpillar's basis of 3%/1000 ft above 1,500 ft asl for continuous duty engines.
4 - Site rating horsepower was rounded up to the nearest 5 horsepower.

Company Name: **Wexpro Company**
Field: **Dry Piney**
Facility Name: **Dry Piney 18**

Fuel Consumption Calculation

Consumption Calculation Method

Fuel Consumption (MMSCF/yr) = Brake Specific Fuel Use (Btu/bhp-hr) * Annual Operating Hrs (hrs/yr) * Horsepower * 1/Fuel Heating Value (SCF/Btu) * 1 MMSCF/10^6 S

Reference No.	Site [1] Rating (HP)	Manufacturer	Model	Annual [2] Op Time (hours)	Fuel Type	Fuel Htg [3] Value (Btu/scf)	Brake Specific [4] Fuel Use (Btu/bhp-hr)	Fuel Use (MMSCF/yr)
001	281	Waukesha	F2895G	8424	Field	1620	8500	12.41

Notes: 1 - Site Rated HP was estimated from manufacturer data sheet.
2 - Run hours estimated based on potential to emit (PTE).
3 - Fuel heating value estimated from Dry Piney Central Facility wet gas analysis.
4 - The BSFC of the engine is from manufacturer literature.

Waukesha

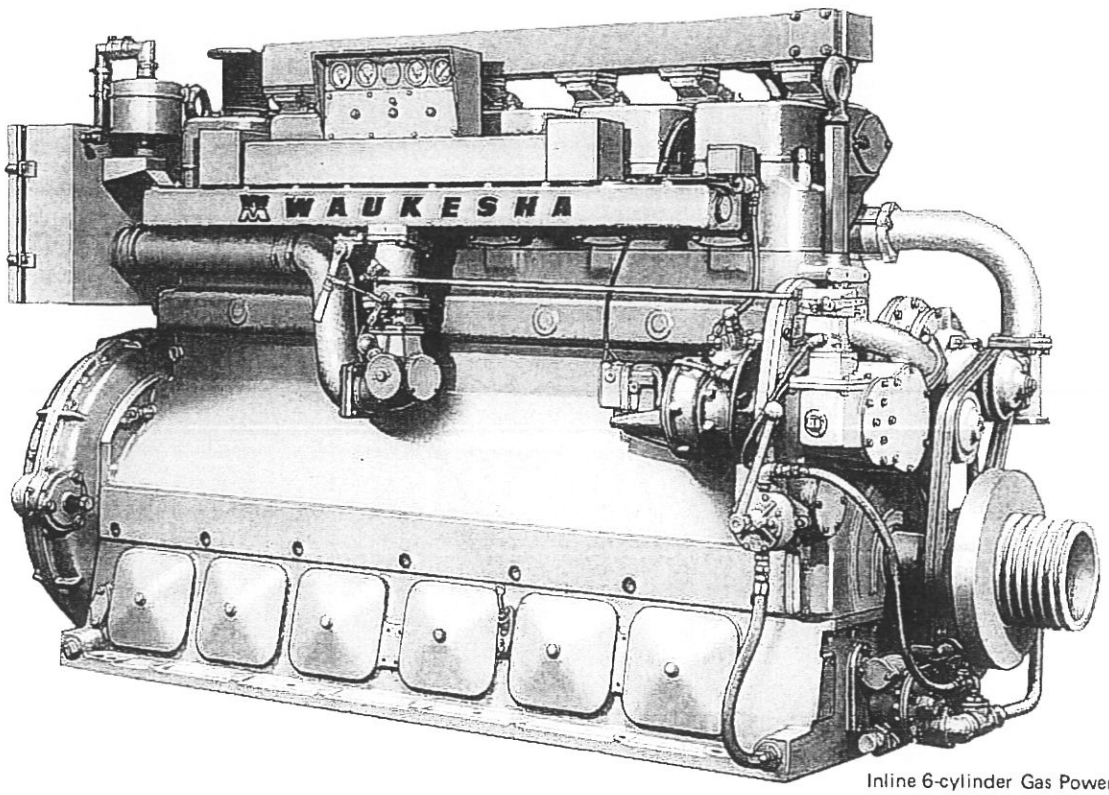
6-cyl. gas power units

TURBOCHARGED & NAT. ASPIRATED
877 MAXIMUM HP RATING

VHP series

F2895

BULLETIN 5128



Inline 6-cylinder Gas Power Unit,
8-1/2 in. bore,
naturally aspirated,
Model F2895GU.

PRINCIPAL ENGINE DATA	MODEL F2895GU	MODEL F2895GSIU
Bore and stroke	8.5 In. x 8.5 In. (216 mm x 216 mm)	8.5 In. x 8.5 In. (216 mm x 216 mm)
Number of Cylinders	In-Line 6	In-Line 6
Displacement	2894 Cu. In. (47.4 l)	2894 Cu. In. (47.4 l)
Number of Main Bearings	7	7
Lube Oil System, Capacity		
Engine, not including lines and filters	43 Gals. (162.8 l)	43 Gals. (162.8 l)
Filters (mounted)	9 Gals. (34 l)	9 Gals. (34 l)
Jacket Water System, Capacity		
Engine without radiator	52.5 Gals. (198.7 l)	52.5 Gals. (198.7 l)
Engine with radiator – Cooling System Capacity varies with the size of the radiator required to cool the specified horsepower load. See Radiator Selection Chart, Codes and Dimensions S-5561.		
Weight, naturally aspirated	11200 Lbs. (5080 kg)	
Weight, turbocharged-intercooled		12200 Lbs. (5543 kg)
Weight, FCU gasoline starting unit	550 Lbs. (249 kg)	550 Lbs. (249 kg)

SPECIFICATIONS

Engine — In-line 6 overhead valve, 4-cycle gas engine.

Air Intake System — Cast aluminum intake manifold with dry, panel type air cleaner with rain shield and service indicator.

Barring Device — Hand.

Breather — Closed breather system.

Connecting Rod — Steel forging, angle-split for easy removal through cylinder liner. Serrated split line for precise cap alignment. Rifle drilled for full pressure piston pin lubrication and piston crown cooling.

Crankcase — Rigid one piece ferrous alloy casting with integral cylinder frame. Deep section main bearing caps cross-tie bolted to crankcase for extra rigidity.

Crankshaft — A multi-plane forging of high alloy steel, with precision ground and hardened main bearing and crankpin journals. Dynamically balanced. Generous overlap of main bearing and crankpin journals for increased crankshaft stiffness. Seven large diameter main bearings.

Cylinder Head — An interchangeable deep section casting, one for each cylinder. Four overhead valves per cylinder — dual stellite-faced intake valves and dual stellite-faced Inconel exhaust valves, 30° angle seat. Solid stellite valve seat inserts. Valve lifters with hydraulic push rods. Valve guides of ferrous alloy. Alloy iron rocker arms. Cylinder head gasket has laminated fire ring to seal combustion. Each head casting is rigidly mounted to crankcase by eight (8) 1 inch diameter high strength steel alloy studs.

Cylinder Liner — Removable wet type.

Engine Rotation — Counterclockwise when facing flywheel.

Exhaust System — Cast iron individual water cooled exhaust manifold with 5" (127 mm) vertical rear outlet with flexible stainless steel connection.

Flywheel and Ring Gear — Flywheel machined for Fawick 28CB525 external flange.

Flywheel Housing — SAE No. 00.

Fuel System — Carburetor, 4 in. (102 mm) natural gas updraft type with Fisher gas regulator.

Gear Train — Shaved gear teeth for more uniform loading and reduced gear noises.

Governor — Gear-driven, variable speed, hydraulic type. Friction throttle for speed setting.

Instrumentation Panel — Engine mounted including water temperature, oil temperature, oil pressure and compound pressure gauges, mechanical tachometer, ignition switch. Hourmeter is engine mounted.

Jacket Water System — High capacity, "V" belt driven centrifugal water pump. Thermostatic temperature regulation valves for rapid warm-up and uniform temperature control. Full flow by-pass for most effective coolant circulation during warm-up. Directional flow for controlled cylinder head cooling. Belt driven auxiliary water pump for circulation of water through oil cooler.

Oil Pan — Base type with access openings provide surface area to permit inspection, maintenance and removal of connecting rod and main bearings.

Lube Oil System — Full pressure system with high capacity gear-type pump. Externally adjustable relief valve for accurate pressure control. Full flow through lube oil cooler, shell and tube type. Full flow oil filter. Mounted. Hand primer pump.

Pistons — Heavy section contour ground oil cooled aluminum alloy with ni-resist top ring groove insert and floating piston pins.

Safety Controls — High water temperature, low oil pressure, mechanical fuel shut-off valve. Overspeed shutdown. Manual reset type.

Turbocharged-Intercooled Model — Model F2895GSIU has one (1) exhaust driven turbocharger, power limiter, vertical outlet, and one (1) air-to-water intercooler, gas pressure regulator with 25 lbs. maximum inlet pressure setting balance connections. Flexible exhaust connection. Intercooler water circulation provided by oil cooler pump. 20 psi gas required for full load operation.

Vibration Damper — Viscous type, mounted at front end of crankshaft.

OPTIONAL ACCESSORIES
(Available as original equipment when specified)

Controls — Woodward hydraulic and electric governors. Electric or pneumatic speed modulators. Main bearing high temperature shutdown. Waukesha Engomatic® Control System.

Cooling System — Radiator, heat exchanger, ebullient cooling.

Filter — Sweet or sour natural gas, sewage gas, not mounted.

POWER RATINGS

M = MAXIMUM C = CONTINUOUS

MODEL	COM-PRES-SION RATIO	INTER-COOLER INLET WATER TEMP°F	MAX. TORQUE @RPM	BRAKE HORSEPOWER AT SPEEDS INDICATED													
				600		700		800		900		1000		1100		1200	
				M	C	M	C	M	C	M	C	M	C	M	C	M	C
NATURAL GAS WITHOUT ACCESSORIES																	
F2895G	8.2:1		2349-400	266	200	308	231	347	260	385	289	417	313	446	335	470	353
F2895G†	10:1		2475-700	282	212	330	248	377	283	420	315	461	346	498	374	526	395
F2895GSI	8.2:1	85	3833-*	439	285	512	333	585	380	658	428	731	475	804	523	877	570
F2895GSI	8.2:1	130	3641-*	417	271	486	316	556	361	625	406	695	452	764	497	833	541
NATURAL GAS WITH ACCESSORIES																	
F2895GU	8.2:1		2310-400	261	196	302	227	339	254	375	281	404	303	430	323	450	338
F2895GU†	10:1		2430-700	277	208	324	243	369	277	410	308	448	336	482	362	506	380
F2895GSIU	8.2:1	85	3793-400	433	281	505	328	576	374	647	421	717	466	788	512	858	558
F2895GSIU	8.2:1	130	3609-400	412	268	480	312	547	356	615	400	682	443	748	486	814	529
HD-5 PROPANE WITHOUT ACCESSORIES																	
F2895G	8.2:1		2438-700	278	209	325	244	370	278	411	308	450	338	482	362	505	379
HD-5 PROPANE WITH ACCESSORIES																	
F2895GU	8.2:1		2392-700	273	205	319	239	362	272	401	301	437	328	466	350	485	364

† High Ratio Pistons for Best Fuel Economy. Use Dry Gas Having a High Methane Content.
S = Turbocharged I = Intercooled *Maximum Torque — Any Speed
Performance Curve Supplied on Request
Ratings are based on availability of 1000 BTU HHV gas. For natural gas having less than 1000 BTU HHV, see chart S3955 for percentage loss of horsepower. For sewage gas ratings consult Waukesha Motor Company.
Turbocharged-Intercooled Engines are suitable for operation on 110 Octane (MM) or higher gas. Ratings available for HD-5 Propane 95 Octane (MM) depending upon operating conditions and approved by Waukesha Motor Company.

RATING STANDARDS

MAXIMUM RATING: Maximum HP output of engine which can be demonstrated within 5% at the factory under standard conditions. Engine should not be applied at this rating without prior approval of Waukesha Motor Company, Engineering Division.
Ratings are corrected to sea level barometric pressure of 29.92" hg. and standard temperature of 60 F.
INTERMITTENT RATING: 90% of Maximum Rating. The HP and speed which can be applied under specific conditions of varying load and/or speed. This rating is used for standby, standby-continuous, and peaking applications. Some users prefer to operate for long periods in this higher HP range with full knowledge that this may result in higher maintenance.
CONTINUOUS RATINGS: The HP and speed which can be applied without reduction.
TURBOCHARGED — INTERCOOLED POWER OUTPUT SETTING: Power output will be set to the maximum load requirement at the specified RPM providing this load requirement is within the rating limits of the engine. When load is not specified for the intended speed, the engine will be set for the maximum continuous horsepower rating.
SPECIAL RATINGS: All published ratings of the Waukesha Motor Company are a general guide for a broad range of applications. Other ratings based on specific load applications and economic requirements are available upon receipt at the factory of detailed information.

DEDUCTIONS FOR ALTITUDE AND TEMPERATURE

Type of Engine	RATING		
	Maximum	Intermittent	Continuous
Naturally Aspirated	3% for each 1000' above sea level	3% for each 1000' above 1000' altitude	3% for each 1000' above 2000' altitude
	1% for each 10° over 60 F.	1% for each 10° over 80 F.	1% for each 10° over 100 F.
Turbocharged Intercooled	2% for each 1000' above sea level	2% for each 1000' above 1500' altitude	2% for each 1000' above 3000' altitude
	1% For Each 10° Over 100 F. Ambient Temperature		
	Deduct 1% for each 10° increase in intercooler water above 85 F. 130 F. MAXIMUM		

The manufacturer reserves the right to change or modify, without notice, the design, equipment specifications or ratings as herein set forth without incurring any obligation either with respect to engines previously sold or in the process of construction except where otherwise specifically guaranteed by the manufacturer.

Flywheel and Ring Gear — Flywheel machined to suit requirements.

Fuel Systems — Carburetor, combination HD-5 propane and natural gas, sewage gas.

Pistons — Natural gas, high ratio model F2895GU.

Power Take Off — Stub shaft for direct drive.

Starting — Air, electric, hydraulic, line voltage, model FCU gasoline starting unit.

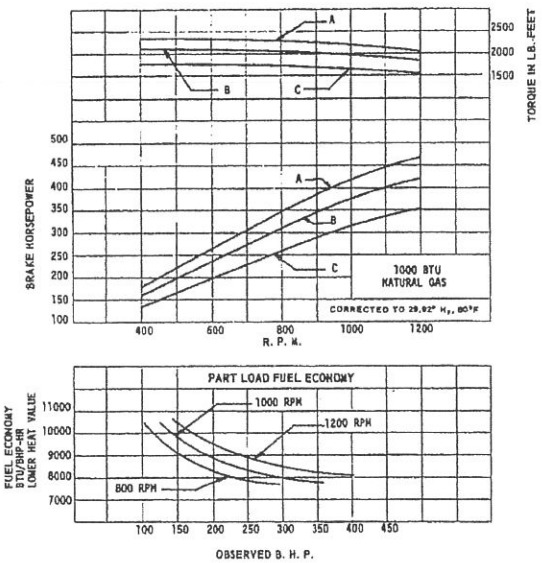
PERFORMANCE CURVES

Curve A: Maximum Rating
Curve B: Intermittent Rating
Curve C: Continuous Rating

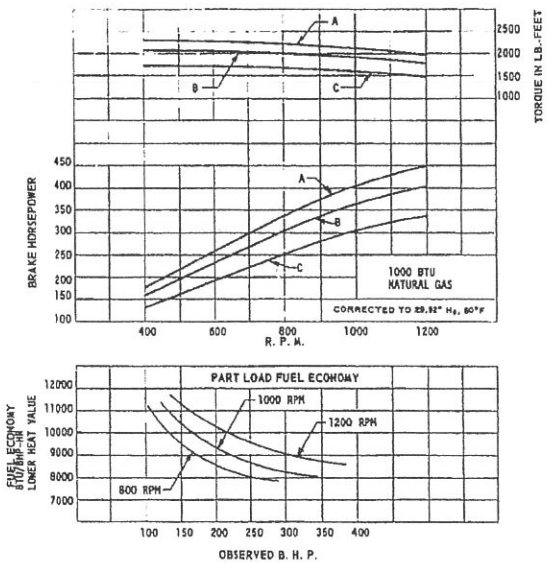
All ratings corrected to 29.92" Hg and 60° F.

Power Unit ratings (right hand column) show deductions for Air Cleaner and 60" diameter, 8 blade fan. All engine and power unit models equipped with 4" updraft carburetor.

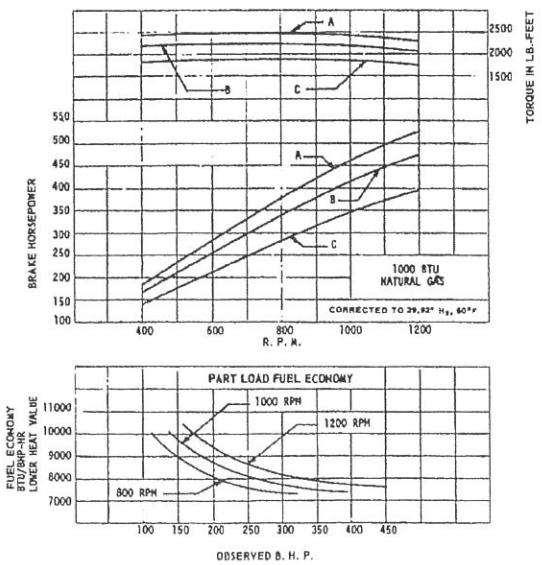
Model F2895G Engine Only
Naturally Aspirated
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



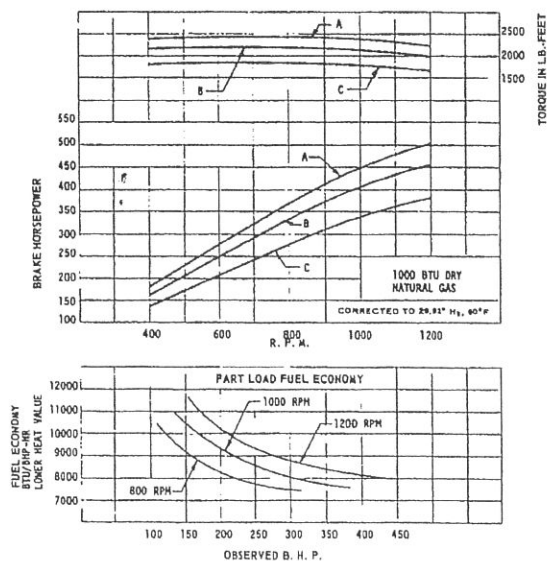
Model F2895GU Power Unit
Naturally Aspirated
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



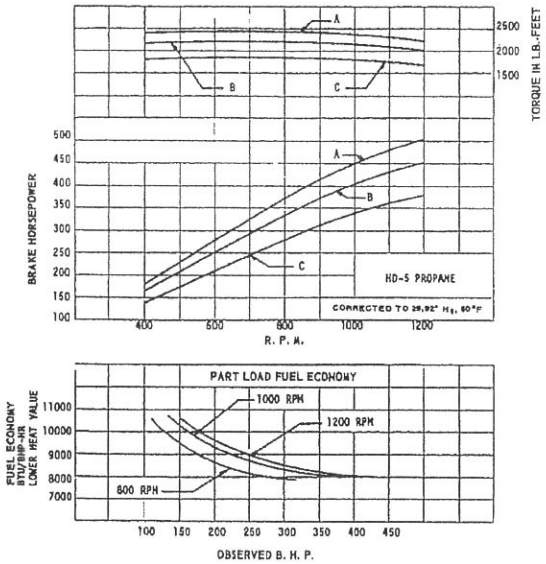
Model F2895G Engine Only
Naturally Aspirated
10:1 Compression Ratio — 1000 BTU HHV Natural Gas



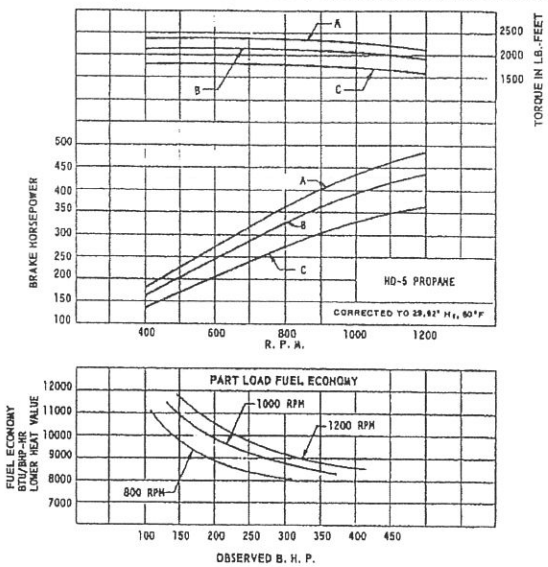
Model F2895GU Power Unit
Naturally Aspirated
10:1 Compression Ratio — 1000 BTU HHV Natural Gas



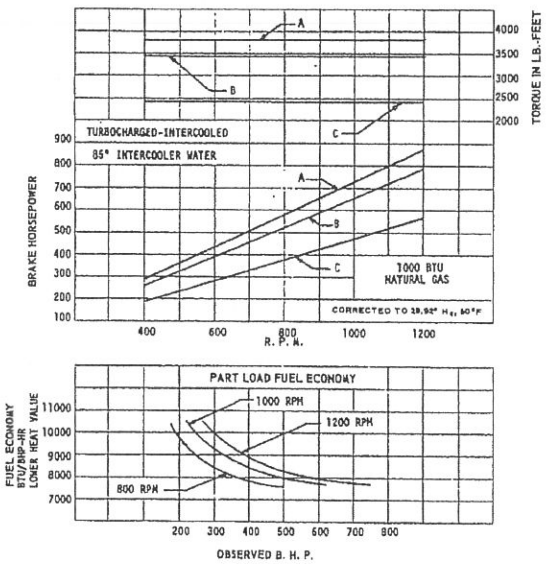
Model F2895G Engine Only
Naturally Aspirated
8.2:1 Compression Ratio – HD-5 Propane, 95 Octane (MM)



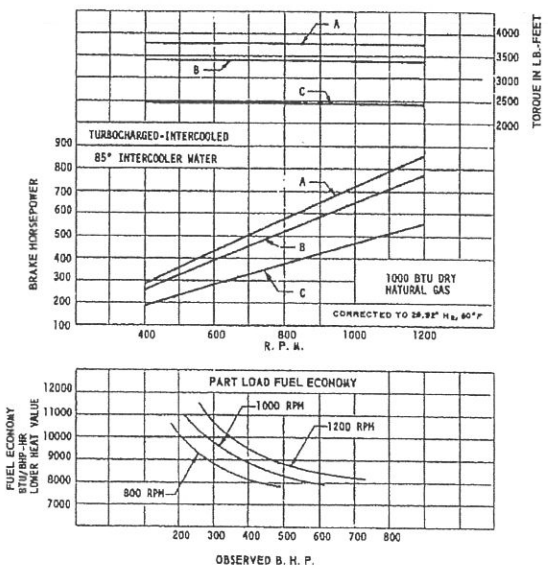
Model F2895GU Power Unit
Naturally Aspirated
8.2:1 Compression Ratio – HD-5 Propane, 95 Octane (MM)



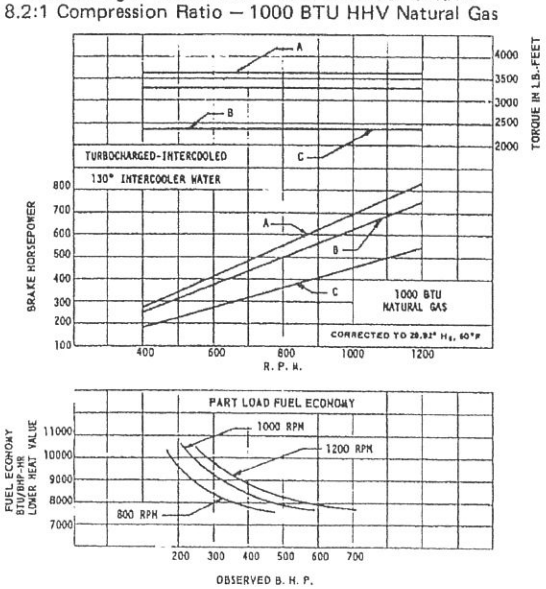
Model F2895GSI Engine Only
Turbocharged-Intercooled – 85° Intercooler Water
8.2:1 Compression Ratio – 1000 BTU HHV Natural Gas



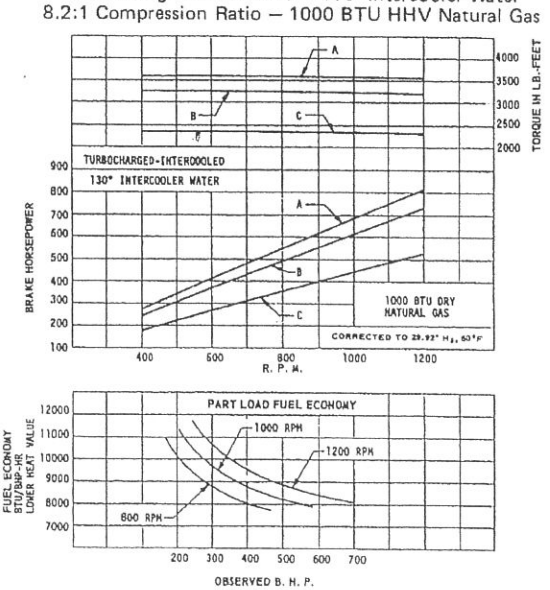
Model F2895GSIU Power Unit
Turbocharged-Intercooled – 85° Intercooler Water
8.2:1 Compression Ratio – 1000 BTU HHV Natural Gas



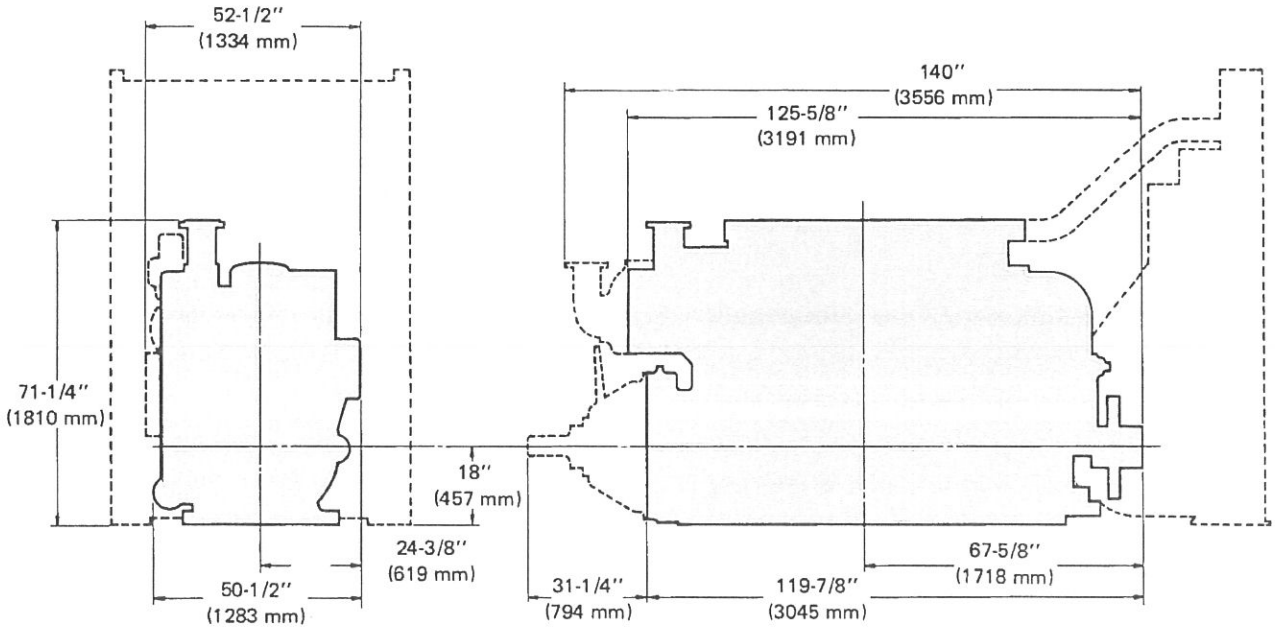
Model F2895GSI Engine Only
Turbocharged-Intercooled – 130° Intercooler Water
8.2:1 Compression Ratio – 1000 BTU HHV Natural Gas



Model F2895GSIU Power Unit
Turbocharged-Intercooled – 130° Intercooler Water
8.2:1 Compression Ratio – 1000 BTU HHV Natural Gas



DIMENSIONS



Components and accessory locations and dimensions may vary with service and installation requirements. Dimensions not guaranteed. Detailed print available for layout work.

WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN 53186
Ridgewood, N.J. 07451 Houston, Tex. 77027 Tulsa, Okla. 74105 Downey, Calif. 90240 Anchorage Alas. 99502
A BANGOR PUNTA COMPANY

Bulletin 5128

6-71 Litho in U.S.A.

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Emission Calculation for External Combustion Sources

AP-42 Calculation Method

(For Estimating Emissions, Using Emission Factors from EPA AP-42, Table 1.4-1 and Table 1.4-2)

Burner Data

Reference No.	Quantity	Fuel Use (SCF/Hr)	Equipment	Annual Op Time (hours)	Fuel Type	Fuel Htg Value (Btu/scf)	Fraction of VOC [1]
002	1	13.0	TE Generator	8760	Field	1620	0.58

1 - Fraction of VOC is derived from the fuel gas analysis (MW_{VOC}/MW_{TOTAL})

Emission Factors

Reference No.	Fuel Use (SCF/Hr)	Emission Factors					
		NOx (Lb/MMFt^3)	CO (Lb/MMFt^3)	SO_2 (Lb/MMFt^3)	PM (Lb/MMFt^3)	TOC [2] (Lb/MMFt^3)	VOC [3] (Lb/MMFt^3)
002	13.0	100.0	84.0	0.6	7.6	11.0	6.4
EF Source		AP-42	AP-42	AP-42	AP-42	AP-42	Estimate

2- Total Organic Compunds (TOC)

3 - VOC emission factor determined by taking TOC factor times fraction of fuel gas that was VOC.

Emissions (Lb/Hr) = E.F. (Lb/MMft^3) * FHV/1020 * Burner Rating (MMbtu/Hr) * 1/1020 * 1 MMft^3/1x10^6 ft^3 * 1x10^6 Btu/MMbtu

Emissions (TPY) = Emissions (Lb/Hr) * Annual Operating Time (Hr/Yr) * 1 ton/2,000 Lb

Source Emissions

Reference No.	Source Emissions									
	NOx		CO		SO_2		PM		VOC	
	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
002	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Fugitives Emission Calculation

Equipment Leak Emission Estimates for Oil and Gas Production Operations

(Emission Factors Derived From Table 2-4, EPA-453/R-95-017, "Protocol for Equipment Leak emission Estimates", November 1995)

Component Type	Equipment Service Category			
	Gas (lbs/hr/component)	Heavy Oil[3] (<20 API Gravity) (lbs/hr/component)	Light Oil (>20 API Gravity) (lbs/hr/component)	Water/Light Oil[2] (lbs/hr/component)
Connectors	4.41E-04	1.65E-05	4.63E-04	2.43E-04
Flanges	8.60E-04	8.60E-07	2.43E-04	6.39E-06
Open-ended Lines	4.41E-03	3.09E-04	3.09E-03	5.51E-04
Pumps	5.29E-03	0.00E+00	2.87E-02	5.29E-05
Valves	9.92E-03	1.85E-05	5.51E-03	2.16E-04
Other[1]	1.94E-02	7.05E-05	1.65E-02	3.09E-02

* - All factors are for total organic compound emission rates (includes non-VOC's such as methane and ethane).
1 - "Other" equipment type includes compressors, pressure relief valves, relief valves, diaphrams, drains, dump arms, hatches, instruments, meters, polished rods and vents.
2 - Water/Light Oil factors apply to water streams in oil service with a water content greater than 50% to 99% For streams with water content greater than 99%, the emission rate is considered negligable.
3 - The emission factor for pumps was not derived in the actual protocol, the factor for "other" has been substituted for completeness.

INPUTS:

1. List the quantity of each type of component in each type of service at the applicant's facility:

Component Type	Equipment Service Category			
	Gas	Heavy Oil (<20 API Gravity)	Light Oil (>20 API Gravity)	Water/Light Oil
Connectors	38.000	0.000	7.000	0.000
Flanges	5.000	0.000	1.000	0.000
Open-ended Lines	5.000	0.000	0.000	0.000
Pumps	0.000	0.000	0.000	0.000
Valves	15.000	0.000	10.000	0.000
Other	2.000	0.000	3.000	0.000

NOTE: The component count is estimated based on an LDAR site-specific count for "Like Kind" facility.

Sample Calculation:

TOC (TPY) = component quantity * component factor * 8,760 hr/yr * 1 ton/2,000 lb.s
VOC (TPY) = TOC * VOC Fraction from gas analysis (wt%)

Component Type	Equipment Service Category			
	Gas (TPY of TOC)	Heavy Oil (<20 API Gravity) (TPY of TOC)	Light Oil (>20 API Gravity) (TPY of TOC)	Water/Light Oil (TPY of TOC)
Connectors	0.073387	0.000000	0.014195	0.000000
Flanges	0.018830	0.000000	0.001062	0.000000
Open-ended Lines	0.096562	0.000000	0.000000	0.000000
Pumps	0.000000	0.000000	0.000000	0.000000
Valves	0.651797	0.000000	0.241406	0.000000
Other	0.169950	0.000000	0.217266	0.000000
TOTAL	**1.010526**	**0.000000**	**0.473929**	**0.000000**
Weight VOC Fraction	0.5825	0.00	1.00	1.00
Weight HAP Fraction	0.0709	0.00	0.033	0.033

Note: The weight fraction for HAPs in light oil service was estimated using Colorado emission factors for flash (Moffat County). EF for n-hexane was used for all other HAPs in Bin C.

TPY VOC	0.59	0.00	0.47	0.00
lb/hr VOC	0.13	0.00	0.11	0.00
TPY HAP	0.07	0.00	0.02	0.00
lb/hr HAP	0.02	0.00	0.00	0.00

Source	VOC		Total HAPs	
	(lb/hr)	(TPY)	(lb/hr)	(TPY)
Fugitives	0.24	1.06	0.02	0.09

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Gas Analysis Calculation Sheet

Based on: **Dry Piney Central Facility Gas Analysis**

							LHV BTU Content		HHV BTU Content	
Component	Mole %	Mole Frac.	Lb/Lb mole	MW	VOC	HAP	Btu/scf	Btu/scf*Mole Frac	Btu/scf	Btu/scf*Mole Frac
Carbon Dioxide	10.3907	0.1039	44.01	4.57			0.0	0.00	0.0	0.00
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00			586.8	0.00	637.1	0.00
Nitrogen	22.6175	0.2262	28.02	6.34			0.0	0.00	0.0	0.00
Methane	34.3748	0.3437	16.04	5.51			909.4	312.60	1010.0	347.19
Ethane	0.9145	0.0091	30.07	0.27			1618.7	14.80	1769.6	16.18
Propane	1.4181	0.0142	44.09	0.63	0.63		2314.9	32.83	2516.1	35.68
Isobutane	2.7479	0.0275	58.12	1.60	1.60		3000.4	82.45	3251.9	89.36
n-butane	7.5950	0.0760	58.12	4.41	4.41		3010.8	228.67	3262.3	247.77
Isopentane	5.0677	0.0507	72.15	3.66	3.66		3699.0	187.45	4000.9	202.75
n-pentane	5.8226	0.0582	72.15	4.20	4.20		3706.9	215.84	4008.9	233.42
Cyclopentane	0.0000	0.0000	70.08	0.00	0.00		3512.2	0.00	3763.4	0.00
n-hexane	3.0454	0.0305	86.18	2.62	2.62	2.62	4404.1	134.12	4750.2	144.66
Cyclohexane	0.3186	0.0032	84.18	0.27	0.27		4179.9	13.32	4481.2	14.28
Other Hexanes	3.3515	0.0335	86.18	2.89	2.89		4392.7	147.22	4744.5	159.01
Heptanes	1.6377	0.0164	100.21	1.64	1.64		5100.3	83.53	5500.4	90.08
Methylcyclohexane	0.1932	0.0019	98.19	0.19	0.19		4863.9	9.40	5215.7	10.08
2,2,4-Trimethylpentane	0.1481	0.0015	114.22	0.17	0.17	0.17	5779.1	8.56	6231.5	9.23
Benzene	0.0123	0.0001	78.11	0.01	0.01	0.01	3591.1	0.44	3741.5	0.46
Toluene	0.0161	0.0002	92.14	0.01	0.01	0.01	4273.7	0.69	4474.5	0.72
Ethylbenzene	0.0024	0.0000	106.17	0.00	0.00	0.00	4970.7	0.12	5221.7	0.13
Xylenes	0.0128	0.0001	106.17	0.01	0.01	0.01	4957.4	0.63	5208.4	0.67
C8+Heavies	0.3131	0.0031	315.00	0.99	0.99		5796.3	18.15	5794.1	18.14
Totals	100.0000	1.0000		40.0006	23.3016	2.8342		1490.80		1619.80

Fraction of Vapors that are VOC:	0.5825
Fraction of Vapors that are HAP:	0.0709
Gas Specific Gravity:	1.3808

Lesair Environmental, Inc.
www.lesair.com

QUESTAR APPLIED TECHNOLOGY

1210 D. Street, Rock Springs, Wyoming 82901

(307) 352-7292

LIMS ID:	N/A		Description:	Dry Piney Treater Vent
Analysis Date/Time:	4/30/2010	8:42 AM	Field:	Dry Piney
Analyst Initials:	PRP		ML#:	Wexpro
Instrument ID:	Instrument 1		GC Method:	Quesbtex
Data File:	QPC96.D			
Date Sampled:	4/29/2010			

Component	Mol%	Wt%	LV%
Methane	34.3748	14.0373	26.8067
Ethane	0.9145	0.7000	1.1283
Propane	1.4181	1.5917	1.7988
Isobutane	2.7479	4.0655	4.1382
n-Butane	7.5950	11.2365	11.0231
Neopentane	0.0489	0.0897	0.0862
Isopentane	5.0188	9.2171	8.4568
n-Pentane	5.8226	10.6933	9.7081
2,2-Dimethylbutane	0.0785	0.1723	0.1509
2,3-Dimethylbutane	0.3149	0.6907	0.5939
2-Methylpentane	1.8408	4.0379	3.5163
3-Methylpentane	1.1173	2.4508	2.0985
n-Hexane	3.0454	6.6802	5.7634
Heptanes	2.3260	5.6037	4.4004
Octanes	0.2654	0.7690	0.6121
Nonanes	0.0621	0.1940	0.1486
Decanes plus	0.0008	0.0028	0.0022
Nitrogen	22.6175	16.1276	11.4153
Carbon Dioxide	10.3907	11.6399	8.1522
Oxygen	0.0000	0.0000	0.0000
Hydrogen Sulfide	0.0000	0.0000	0.0000
Total	100.0000	100.0000	100.0000

Global Properties		Units
Gross BTU/Real CF	1636.4	BTU/SCF at 60°F and14.73 psia
Sat.Gross BTU/Real CF	1609.5	BTU/SCF at 60°F and14.73 psia
Gas Compressibility (Z)	0.9896	
Specific Gravity	1.3573	air=1
Avg Molecular Weight	39.287	gm/mole
Propane GPM	0.388648	gal/MCF
Butane GPM	3.285212	gal/MCF

Component	Mol%	Wt%	LV%
Benzene	0.0123	0.0246	0.0159
Toluene	0.0161	0.0378	0.0248
Ethylbenzene	0.0024	0.0065	0.0043
M&P Xylene	0.0105	0.0283	0.0186
O-Xylene	0.0023	0.0061	0.0040
2,2,4-Trimethylpentane	0.1481	0.4306	0.3425
Cyclopentane	0.0000	0.0000	0.0000
Cyclohexane	0.3186	0.6824	0.4991
Methylcyclohexane	0.1932	0.4828	0.3574
Description:	Dry Piney Treater Vent		

GRI GlyCalc Information

Component	Mol%	Wt%	LV%
Carbon Dioxide	10.3907	11.6399	8.1522
Hydrogen Sulfide	0.0000	0.0000	0.0000
Nitrogen	22.6175	16.1276	11.4153
Methane	34.3748	14.0373	26.8067
Ethane	0.9145	0.7000	1.1283
Propane	1.4181	1.5917	1.7988
Isobutane	2.7479	4.0655	4.1382
n-Butane	7.5950	11.2365	11.0231
Isopentane	5.0677	9.3068	8.5430
n-Pentane	5.8226	10.6933	9.7081
Cyclopentane	0.0000	0.0000	0.0000
n-Hexane	3.0454	6.6802	5.7634
Cyclohexane	0.3186	0.6824	0.4991
Other Hexanes	3.3515	7.3517	6.3596
Heptanes	1.6377	3.9455	3.1607
Methylcyclohexane	0.1932	0.4828	0.3574
2,2,4 Trimethylpentane	0.1481	0.4306	0.3425
Benzene	0.0123	0.0246	0.0159
Toluene	0.0161	0.0378	0.0248
Ethylbenzene	0.0024	0.0065	0.0043
Xylenes	0.0128	0.0344	0.0226
C8+ Heavies	0.3131	0.9249	0.7360
Subtotal	100.0000	100.0000	100.0000
Oxygen	0.0000	0.0000	0.0000
Total	100.0000	100.0000	100.0000

Company Name: **Wexpro Company**
Facility Name: **Dry Piney 18**

Attachment C

Baseline Emissions and Offsets Demonstration

Prepared for:
Wexpro Company

Prepared by:
Lesair Environmental, Inc.
www.Lesair.com

SUBLETTE COUNTY PERMITTED EMISSIONS April 1, 2008 - PRESENT

company	field	facility	date of permit application	date of receipt	permit/waiver / AP #	Equipment Design / Current Actual Emissions (TPY)		Baseline Emissions (TPY)		increase/decrease from baseline emissions (TPY)		VOC Offset Bank	NOx Offset Bank	Reason for Change
						VOC	NO_x	VOC	NO_x	VOC	NO_x			
Wexpro	Dry Piney	Dry Piney 35	10/22/2010			19.8	0.7	30.4	0.7	-10.6	0	-10.6	0.0	Swapped Kimray 4015 for crippled 2015 pump, accounted for additional HT pump
Wexpro	Dry Piney	Dry Piney Central Facility	4/3/2012			22.2	2.6	21.2	3.3	1	-0.7	1.5	-0.7	Equipment changes
Wexpro	Dry Piney	Dry Piney 20	6/7/2015			2.6	2.0	1.9	2.2	0.7	-0.2	1.1	-0.2	Proposed replacement engine
Wexpro	Dry Piney	Dry Piney 18	6/7/2015			1.6	1.4	1.5	2.1	0.1	-0.7	0.2	-0.7	Emissions reductions on existing engine being claimed
		Wexpro TOTAL				46.2	6.7	55.0	8.3	-8.8	-1.6	-7.90	-1.60	

Notes:

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Wyoming Air Quality Application Emission Summary Sheet - Baseline Emissions Estimation

2008 Baseline Controlled Production Equipment Emissions

			NOx		CO		SO2		Particulates		VOC		Total HAPs	
Ref No.	Equipment	Note	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 254 HP Caterpillar G398SITA Genset	a	0.56	2.05	0.56	2.05	0.00	0.00	0.02	0.08	0.11	0.41	0.03	0.10
002	(1) Thermo Electric Generator	b	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
003	Fugitives	c	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	1.06	0.02	0.09
	Total		**0.56**	**2.06**	**0.56**	**2.06**	**0.00**	**0.00**	**0.02**	**0.08**	**0.35**	**1.47**	**0.05**	**0.19**

NOTES:

a - Emission factors for NOx, CO and VOC were taken from WAQD BACT for a controlled engine using a catalyst. Other factors were calculated from AP-42 Table 3.2-3. Engine emissions ar based on the actual average 2006/2007 run hours of 7323 hours.

b - Burner emissions based on EPA AP-42 emission factors from Section 1.4, Tables 1.4-1 and 1.4-2 for uncontrolled natural gas burners, the worst case assumption that burners operate 8,760 hours per year, and a fuel heating value of 1619.8 Btu/SCF. Thermoelectric generator has existed at this location since 2006

c - Fugitive emissions account for VOC/HAP vapors from connections, valves, tank hatches, and relief vent/valves. Emission Factors derived from Table 2-4, EPA-453/R-95-017.

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Wyoming Air Quality Application Emission Summary Sheet - Baseline Emissions Estimation

2008 Baseline Uncontrolled Production Equipment Emissions

			NOx		CO		SO2		Particulates		VOC		Total HAPs	
Ref No.	Equipment	Note	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 254 HP Caterpillar G398SITA Genset	a	4.77	17.47	8.03	29.41	0.00	0.00	0.02	0.08	0.06	0.23	0.04	0.16
002	(1) Thermo Electric Generator	b	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
003	Fugitives	c	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	1.06	0.02	0.09
	Total		**4.77**	**17.48**	**8.03**	**29.41**	**0.00**	**0.00**	**0.02**	**0.08**	**0.31**	**1.30**	**0.06**	**0.25**

NOTES:

a - The engine NOx, CO, VOC emission factors are from manuacturer documentation for an uncontrolled engine, other EF's were taken from AP-42 Table 3.2-3. Engine emissions ar based on the actual average 2006/2007 run hours of 7323 hours.

b - Burner emissions based on EPA AP-42 emission factors from Section 1.4, Tables 1.4-1 and 1.4-2 for uncontrolled natural gas burners, the worst case assumption that burners operate 8,760 hours per year, and a fuel heating value of 1619.8 Btu/SCF. Thermoelectric generator has existed at this location since 2006

c - Fugitive emissions account for VOC/HAP vapors from connections, valves, tank hatches, and relief vent/valves. Emission Factors derived from Table 2-4, EPA-453/R-95-017.

Company Name: **Wexpro Company**
Field: **Dry Piney**
Facility Name: **Dry Piney 18**

Baseline Emission Calculation for Natural Gas Fueled Engines (Controlled)

2006/2007 Baseline Emissions for Offsets Determination

(For Estimating Emissions, using factors supplied by the manufacturer or if no other data is available using AP-42 factors)

Engine Data

Reference No.	Site[1] Rating (HP)	Manufacturer	Model	Annual[2] Op Time (hours)	Fuel Type	Fuel Htg[3] Value (Btu/scf)	Emission Factor Source	Fuel[4] Consumption (MMSCF/yr)
001	254	Waukesha	F2895G	7323	Field	1620	Manuf./AP-42	9.76

Notes: 1 - Site rating is based on the horsepower rating of the engine from permit CT-3335A (based on ESP load from 03/2002 submittal to WAQD).
2 - Run hours based on 2006/2007 average hours of operation.
3 - Fuel heating value estimated from Dry Piney Central Facility Gas Analysis
4 - Engine fuel consumption based on 254 Hp, 7323 hours of operation and BSFC 8500 Btu/Hp-Hr.

Emission Factors (Uncontrolled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (lb/MMBtu)	CO (lb/MMBtu)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (lb/MMBtu)	HCHO (lb/MMBtu)
001	Waukesha F2895G	254	2.21E+00	3.72E+00	5.88E-04	9.50E-03	2.96E-02	2.05E-02

Notes: 1 - All uncontrolled emission factors are based on AP-42 Table 3.2-3

Emission Factors (Controlled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (g/hp-hr)	CO (g/hp-hr)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (g/hp-hr)	HCHO (g/hp-hr)
001	Waukesha F2895G	254	1.0	1.0	5.88E-04	9.50E-03	0.20	0.05

Notes: 1 - NOx, CO, VOC and HCHO emission factors are those demonstrated in Permit C-3336.
All other EF's were calculated from AP-42 Table 3.2-3.

Baseline Source Emissions (Uncontrolled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895G	4.77	17.47	8.03	29.41	0.00	0.00	0.02	0.08	0.06	0.23	0.04	0.16

Baseline Source Emissions (Controlled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895G	0.56	2.05	0.56	2.05	0.00	0.00	0.02	0.08	0.11	0.41	0.03	0.10

QUESTAR

Wexpro Company
1140 West 200 South
P.O. Box 45003
Salt Lake City, UT 84145-0003

Environmental & Safety Services

February 24, 2015

Department of Environmental Quality
Air Quality Division
Herschler Building, 2E
122 W. 25th Street
Cheyenne, WY 82002

Reviewer AMB
cc:
Modeler
D.E.
File A0000684
IMP FID F00211S

RE: CT-3335A; Dry Piney 18 Facility
Chapter 6, Section 2 Air Permit Application
NWSW Section 10, T27N, R114W
Sublette County, Wyoming

Ladies/Gentlemen:

Wexpro Company is submitting a permit application for engine emissions reductions at the Dry Piney 18 facility. The existing genset at this facility is currently authorized by permit CT-3335A (issued July 20, 2010), site rated at 254 HP. Upon re-evaluation by Wexpro staff, the new site-rating of the engine is 295 HP. Wexpro is updating this submittal to show the newly determined site rating of 295 HP and limited hours of operation of 8424 hours per year. Wexpro is installing a new non-selective catalytic reduction (NSCR) catalyst which achieves greater emissions control. As a result, Wexpro is claiming the emissions credits for this emissions reduction. The emissions associated with these changes are included in this submittal. This application also serves to enter the additional sources at this location (thermoelectric generator and fugitive sources) into the WAQD IMPACT system.

As per the Sublette County Banking/Voluntary Emissions Reduction policy (October 10, 2011), creditable offsets must be demonstrated in any Sublette County permit modification. The 2008 baseline emissions for this facility were calculated using the historical equipment and 8760 hours of operation (as permitted in CT-3335A) to determine the facility baseline emissions. These baseline emissions are shown in Attachment C, and demonstrate that this modification will not yield a significant impact to air quality in Sublette County.

The emissions reduction at this facility was done to allow for the proposed installation of a new engine at the Dry Piney 20 facility. The Dry Piney 20 facility engine modification is being demonstrated in a separate submittal, but creditable offsets for both the Dry Piney 18 and Dry Piney 20 are shown in Attachment C to demonstrate total offsets available. After the installation of the proposed engine at the Dry Piney 20 and the new catalyst installation at the Dry Piney 18, Wexpro's offset bank totals 8.13 Tons of VOC and 0.90 Tons of NOx.

If you should have any questions please contact me at (801) 324-3062.

Sincerely,

Tom Bradley
Senior Environmental Coordinator

RECEIVED
MAR 11 2015
AIR QUALITY DIVISION

Company Name: **Wexpro Company**
Facility Name: **Dry Piney 18**

Attachment A

WAQD IMPACT Forms

Prepared for:
Wexpro Company

Prepared by:
Lesair Environmental, Inc.
www.Lesair.com

WYOMING

Department of Environmental Quality Air Quality Division

Permit Application Form

Is this a revision to an existing application?

Yes X No

Previous Application #: CT-3335A

Date of Application: 2/23/2015

COMPANY INFORMATION:

Company Name: Wexpro Company

Address: P.O. Box 45360

City: Salt Lake City State: Utah Zip Code: 84145

Country: USA Phone Number: (801) 324-3062

FACILITY INFORMATION:

Facility Name: Dry Piney 18

New Facility or Existing Facility: Existing

Facility Description: Oil and Natural Gas Production

Facility Class: True Minor Operating Status: Operating

Facility Type: Production Site

For Oil & Gas Production Sites ONLY:

First Date of Production (FDOP)/Date of Modification: 10/15/1970

Does production at this facility contain H2S?* No

If yes, contact the Division.

API Number(s): 49-035-20165

NAICS Code: 1311

FACILITY LOCATION:

***Enter the facility location in either the latitude/longitude area or section/township/range area. Both are not required.**

Physical Address:

City: Zip Code:

State: WY County:

OR

Latitude: 42.33888 Longitude: -110.38180

Quarter Quarter: NWSW Quarter:

Section: 10 Township: 27N Range: 114W

For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)

CONTACT INFORMATION:

***Note that an Environmental AND NSR Permitting Contact is required for your application to be deemed complete by the agency.**

Title: Mr. First Name: Tom

Last Name: Bradley

Company Name: Wexpro Company

Job Title: Environmental Coordinator

Address: P.O. Box 45360

City: Salt Lake City State: Utah

Zip Code: 84145

Primary Phone No.: (801) 324-3062 E-mail: Tom.Bradley@questar.com

Mobile Phone No.: Fax No.: (801) 324-3883

Contact Type: Compliance Contact Start Date:

Additional Contact Type (if needed):
Title: First Name:
Last Name:
Company Name:
Job Title:
Address:
City: State:
Zip Code:
Primary Phone No.: E-mail:
Mobile Phone No.: Fax No.:
Contact Type: Start Date:

FACILITY APPLICATION INFORMATION:

General Info:

Has the facility changed location or is it a new/ greenfield facility?	No
Has a Land Use Planning document been included in this application?	No
Is the facility located in a sage grouse core area?*	No
If the facility is in a sage grouse core area, what is the WER number?	

** For questions about sage grouse core area, contact WY Game & Fish Department.*

Federal Rules Applicability - Facility Level:

Prevention of Significant Deterioration (PSD):	No
Non-Attainment New Source Review:	No

Modeling Section:

Has the Air Quality Division been contacted to determine if modeling is required?	No
Is a modeling analysis part of this application?	No
Is the proposed project subject to Prevention of Significant Deterioration (PSD) requirements?	No
Has the Air Quality Division been notified to schedule a pre-application meeting?	No
Has a modeling protocol been submitted to and approved by the Air Quality Division?	No
Has the Air Quality Division received a Q/D analysis to submit to the respective FLMs to determine the need for an AQRV analysis?	No

Required Attachments:

- Facility Map ☐
- Process Flow Diagram ☑
- Modeling Analysis (if applicable) ☐
- Land Use Planning Document ☐
- Detailed Project Description ☑
- Emissions Calculations ☑

I, Tom Bradley (Responsible Official (Printed Name)) Environmental Coordinator (Title)

an Official Representative of the Company, state that I have knowledge of the facts herein set forth and that the same are true and correct to the best of my knowledge and belief. I further certify that the operational information provided and emission rates listed on this application reflect the anticipated emissions due to the operation of this facility. The facility will operate in compliance with all applicable Wyoming Air Quality Standards and Regulations.

Signature: (ink) Date: 2/24/2015

Specific Emission Unit Attributes:

Engine

Company Equipment ID:
Company Equipment Description: (1) 295 HP Waukesha F2895GU

Operating Status: Operating
Initial Construction Commencement Date: 11/1/1980
Initial Operation Commencement Date: 11/1/1980
Most Recent Construction/ Modification Commencement Date: Pending

Most Recent Operation Commencement Date: Pending

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Other

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New catalyst being installed and emissions reductions claimed

Name Plate Rating: 450 Units: hp
Site Rating: 295 Units: hp
Primary Fuel Type: Field Gas
Secondary Fuel Type:
Model Name and Number: Waukesha F2895GU
Engine Type: 4 Stroke Rich Burn
Serial Number Tracking Table:
Serial Number: 354033 Order Date:
Manufacturer Name: Waukesha
Construction/Installation Commencement Date: 11/1/1980
Operation Commencement/ Start-up Date: 11/1/1980
Manufacture Date: pre-1980
Btu Content: 1619.8 Units: BTU/scf
Fuel Sulfur Content: 0 Units:
Type of Service: Generator

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

2-02-002-54

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24
Hours/year: 8424

Control Equipment: Yes

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: NOx, CO, VOC

Proposed BACT: NSCR Catalyst with AFR Controller

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant:

Proposed LAER:

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart:

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart:

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: Subpart ZZZZ

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Revised 1/22/2015

Specific Emission Unit Attributes:

Electric Generating Unit

Company Equipment ID:
Company Equipment Description: Thermoelectric Generator

Operating Status: Operating
Initial Construction Commencement Date: 9/10/2006
Initial Operation Commencement Date: 9/10/2006
Most Recent Construction/ Modification Commencement Date: 9/10/2006

Most Recent Operation Commencement Date: 9/10/2006

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Modification

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

Emissions reductions are being claimed, facility being re-permitted through IMPACT

Unit Type: Other
Heat Input Rating (MMBtu/hr): 0.02
Primary Fuel Type: Field Gas
Secondary Fuel Type:
Manufacturer Name: Global
Model Name and Number: CP5120N
Btu Content: 1619.8 Units: BTU/scf
Fuel Sulfur Content: 0 Units: %
Net Electrical Output (MW): 0.00012
Gross Electrical Output (MW): 0.00012

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-99

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Revised 1/22/2015

Control Equipment: NA

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Revised 1/22/2015

Specific Emission Unit Attributes:

Fugitives

Company Equipment ID:

Company Equipment Description: Fugitive Emissions

Operating Status: Operating

Initial Construction Commencement Date: 10/15/1970

Initial Operation Commencement Date: 10/15/1970

Most Recent Construction/ Modification Commencement Date: 10/15/1970

Most Recent Operation Commencement Date: 10/15/1970

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Modification

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

Emissions reductions are being claimed, facility being re-permitted through IMPACT

Type of Fugitive Emission: Fugitive Leaks at O&G

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-99

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 8760

Revised 1/22/2015

Control Equipment: NA

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Revised 11/3/2014

Control Equipment:

Catalytic NOx Control Technology

Manufacturer: _____ Date Installed: Pending

Model Name and Number: _____ Company Control Equipment ID: _____

Company Control Equipment Description: NSCR catalyst

Pollutant(s) Controlled: ☑ CO ☑ NOx ☐ Pb ☐ SO2 ☑ VOC ☐ PM

☐ PM (FIL) ☐ PM Condensible ☐ PM 10 (FIL) ☐ PM 2.5 (FIL) ☐ PM 10 ☐ PM 2.5

☐ Other

NOTE: The following fields require numeric values unless otherwise denoted with an asterisk*

Design Control Efficiency (%): >95% Capture Efficiency (%): 100

Operating Control Efficiency (%): 99%

Catalytic Reduction Type:* Nonselective Catalytic

Reagent Type: _____

Reagent Injection Rate- specify units: _____

Reagent Slip Concentration (ppbv): _____

Reagent Slip Concentration % O2: _____

Inlet Gas Flow Rate (acfm): 2017

Inlet Gas Temp (F): 988 Outlet Gas Temp (F): 1038

Air Fuel Ratio Controller:* Yes

☑ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other emission units that are also vented to this control equipment:* _____

List all release point IDs associated with this control equipment:* _____

Revised 11/3/2014

Release Point Information:

Complete the table below for ***each*** release point. Please include release point information for each emission unit. Multiple attachments may be necessary. A release point is a point at which emissions from an emission unit are released into the ambient (outside)air. List each individual release point on a separate pair of lines (release point ID and description). ***For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)***

Stack Release Point Information		
Company Release Point ID:	Release Point Type:	Vertical
Waukesha F2895GU	Release Point Latitude:	42.33888
	Release Point Longitude:	-110.38180
Company Release Point Description:	Base Elevation (ft):	8,843
Engine driven generator for purposes of power supply to equipment on location.	Stack Height (ft):	14
	Stack Diameter (ft):	0.67
	Exit Gas Velocity (ft/s):	41.27
	Exit Gas Temp (F):	892
	Exit Gas Flow Rate (acfm):	2476
Company Release Point ID:	Release Point Type:	Vertical
Thermoelectric Generator	Release Point Latitude:	42.33888
	Release Point Longitude:	-110.38180
Company Release Point Description:	Base Elevation (ft):	8,843
	Stack Height (ft):	NA
	Stack Diameter (ft):	NA
	Exit Gas Velocity (ft/s):	NA
	Exit Gas Temp (F):	NA
	Exit Gas Flow Rate (acfm):	NA
Company Release Point ID:	Release Point Type:	
	Release Point Latitude:	
	Release Point Longitude:	
Company Release Point Description:	Base Elevation (ft):	
	Stack Height (ft):	
	Stack Diameter (ft):	
	Exit Gas Velocity (ft/s):	
	Exit Gas Temp (F):	
	Exit Gas Flow Rate (acfm):	
Company Release Point ID:	Release Point Type:	
	Release Point Latitude:	
	Release Point Longitude:	
Company Release Point Description:	Base Elevation (ft):	
	Stack Height (ft):	
	Stack Diameter (ft):	
	Exit Gas Velocity (ft/s):	
	Exit Gas Temp (F):	
	Exit Gas Flow Rate (acfm):	

Revised 11/3/2014

Complete the table below for each fugitive (area, volume, line) release point. List each individual release point on a separate line.

Fugitive Release Point Information	
Company Release Point ID:	Release Point Latitude: 42.33888
Fugitives	Release Point Longitude: -110.38180
	Release Height (ft): NA
Company Release Point Description:	
Fugitive leaks from equipment on location (wellhead, genset)	
Company Release Point ID:	Release Point Latitude:
	Release Point Longitude:
	Release Height (ft):
Company Release Point Description:	
Company Release Point ID:	Release Point Latitude:
	Release Point Longitude:
	Release Height (ft):
Company Release Point Description:	
Company Release Point ID:	Release Point Latitude:
	Release Point Longitude:
	Release Height (ft):
Company Release Point Description:	

Company Name: **Wexpro Company**
Facility Name: **Dry Piney 18**

Attachment B

Supporting Emissions Calculations

Prepared for:
Wexpro Company

Prepared by:
Lesair Environmental, Inc.
www.Lesair.com

Proposed Process Description

The commingled fluid stream (containing natural gas, condensate and produced water) is pumped from the well by use of an electric submersible pump. The comingled stream flows from the well location to a separate central facility for separation and processing.

The electric submersible pump is powered by the use of one (1) 295 HP natural gas engine-driven genset. The engine will be controlled by use of a non-selective catalytic reduction (NSCR) catalyst and air-fuel ratio controller (AFRC).

An electric chemical pump exists on site to pump methanol into the well to prevent freezing.

There are fugitive emissions at this location due to potential leaks from valves and connections on the production equipment.

A thermo electric generator is located at the wellhead for cathodic protection.

This is not an exact schematic of the Dry Piney 18 facility. It is a representation of the specific process and production equipment.

LEGEND:

Wellhead ⊗

Underground Line - - - - - -

- Genset

Prepared for:

Wexpro Company

Prepared by:

LESAIR ENVIRONMENTAL, INC.

Dry Piney 18
Sublette County, WY
NWSW Sec 10, T27N, R114W
Latitude: 42.3389°
Longitude: -110.3818°
Elevation: 8,843'
-NOT TO SCALE-

Drawn by: CAD	Date: 02/10/2015
Rev. by:	Date Rev:

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Wyoming Air Quality Application Emission Summary Sheet

Proposed Controlled Production Equipment Emissions

			NOx		CO		SO2		Particulates		VOC		Total HAPs	
Ref No.	Equipment	Note	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 295 HP Waukesha F2895GU	a	0.45	1.92	1.30	5.47	0.00	0.01	0.02	0.10	0.13	0.55	0.05	0.21
002	(1) Thermo Electric Generator	b	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
003	Fugitives	c	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	1.21	0.02	0.11
	Total		**0.46**	**1.92**	**1.30**	**5.48**	**0.00**	**0.01**	**0.02**	**0.10**	**0.41**	**1.76**	**0.07**	**0.31**

NOTES:

a - Emission factors for NOx, CO and VOC were taken from WAQD BACT for a controlled engine using a catalyst. Other factors were calculated from AP-42 Table 3.2-3. Emissions are based on 8424 hours per year.

b - Burner emissions based on EPA AP-42 emission factors from Section 1.4, Tables 1.4-1 and 1.4-2 for uncontrolled natural gas burners, the worst case assumption that burners operate 8,760 hours per year, and a fuel heating value of 1490.8 Btu/SCF.

c - Fugitive emissions account for VOC/HAP vapors from connections, valves, tank hatches, and relief vent/valves. Emission Factors derived from Table 2-4, EPA-453/R-95-017.

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Wyoming Air Quality Application Emission Summary Sheet

Proposed Uncontrolled Production Equipment Emissions

			NOx		CO		SO2		Particulates		VOC		Total HAPs	
Ref No.	Equipment	Note	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 295 HP Waukesha F2895GU	a	13.84	58.30	0.97	4.11	0.00	0.01	0.02	0.10	0.19	0.79	0.05	0.21
002	(1) Thermo Electric Generator	b	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
003	Fugitives	c	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	1.21	0.02	0.11
	Total		**13.84**	**58.30**	**0.98**	**4.11**	**0.00**	**0.01**	**0.02**	**0.10**	**0.47**	**2.01**	**0.07**	**0.31**

NOTES:

a - All uncontrolled emission factors were taken from AP-42 Table 3.2-3. Emissions are based on 8424 hours per year.

b - Burner emissions based on EPA AP-42 emission factors from Section 1.4, Tables 1.4-1 and 1.4-2 for uncontrolled natural gas burners, the worst case assumption that burners operate 8,760 hours per year, and a fuel heating value of 1490.8 Btu/SCF.

c - Fugitive emissions account for VOC/HAP vapors from connections, valves, tank hatches, and relief vent/valves. Emission Factors derived from Table 2-4, EPA-453/R-95-017.

Company Name: **Wexpro Company**
Field: **Dry Piney**
Facility Name: **Dry Piney 18**

Emission Calculation for Natural Gas Fueled Engines (Controlled)

4-Stroke Lean Burn Emissions Calculations

(For Estimating Emissions, using factors supplied by the manufacturer or if no other data is available using AP-42 factors)

Engine Data

Reference No.	Site [1] Rating (HP)	Manufacturer	Model	Annual [2] Op Time (hours)	Fuel Type	Fuel Htg [3] Value (Btu/scf)	Emission Factor Source
001	295	Waukesha	F2895GU	8424	Field	1620	Manuf./AP-42

Notes: 1 - Site rating is based on the horsepower rating of the engine derated by the actual elevation of the facility.
2 - Run hours are the requested annual operating hours
3 - Fuel heating value estimated from Dry Piney Central Facility Gas Analysis

Emission Factors (Uncontrolled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (gm/hp-hr)	CO (gm/hp-hr)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (gm/hp-hr)	HCHO (lb/MMBtu)
001	Waukesha F2895GU	295	21.3	1.5	5.88E-04	9.50E-03	0.29	2.05E-02

Notes: 1 - NOx, CO, and VOC emissions were taken from Manufacturer spec sheets for uncontrolled emissions, other EF's were calculated from AP-42 Table 3.2-3.

Emission Factors (Controlled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (g/hp-hr)	CO (g/hp-hr)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (g/hp-hr)	HCHO (g/hp-hr)
001	Waukesha F2895GU	295	0.7	2.0	5.88E-04	9.50E-03	0.20	2.05E-02

Notes: 1 - NOx, CO, VOC emission factors are from catalyst sizing specifications for this engine. All other EF's were calculated from AP-42 Table 3.2-3.

Source Emissions (Uncontrolled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895GU	13.84	58.30	0.97	4.11	0.00	0.01	0.02	0.10	0.19	0.79	0.05	0.21

Source Emissions (Controlled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895GU	0.45	1.92	1.30	5.47	0.00	0.01	0.02	0.10	0.13	0.55	0.05	0.21

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Emission Calculation for External Combustion Sources

AP-42 Calculation Method

(For Estimating Emissions, Using Emission Factors from EPA AP-42, Table 1.4-1 and Table 1.4-2)

Burner Data

Reference No.	Quantity	Fuel Use (SCF/Hr)	Equipment	Annual Op Time (hours)	Fuel Type	Fuel Htg Value (Btu/scf)	Fraction of VOC [1]
002	1	13.0	TE Generator	8760	Field	1620	0.58

1 - Fraction of VOC is derived from the fuel gas analysis (MW_{VOC}/MW_{TOTAL})

Emission Factors

Reference No.	Fuel Use (SCF/Hr)	Emission Factors					
		NOx (Lb/MMFt^3)	CO (Lb/MMFt^3)	SO_2 (Lb/MMFt^3)	PM (Lb/MMFt^3)	TOC [2] (Lb/MMFt^3)	VOC [3] (Lb/MMFt^3)
002	13.0	100.0	84.0	0.6	7.6	11.0	6.4
EF Source		AP-42	AP-42	AP-42	AP-42	AP-42	Estimate

2- Total Organic Compunds (TOC)
3 - VOC emission factor determined by taking TOC factor times fraction of fuel gas that was VOC.

Emissions (Lb/Hr) = E.F. (Lb/MMft^3) * FHV/1020 * Burner Rating (MMbtu/Hr) * 1/1020 * 1 MMft^3/1x10^6 ft^3 * 1x10^6 Btu/MMbtu

Emissions (TPY) = Emissions (Lb/Hr) * Annual Operating Time (Hr/Yr) * 1 ton/2,000 Lb

Source Emissions

Reference No.	Source Emissions									
	NOx		CO		SO_2		PM		VOC	
	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
002	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Fugitives Emission Calculation

Equipment Leak Emission Estimates for Oil and Gas Production Operations

(Emission Factors Derived From Table 2-4, EPA-453/R-95-017, "Protocol for Equipment Leak emission Estimates", November 1995)

Component Type	Equipment Service Category			
	Gas (lbs/hr/component)	Heavy Oil[3] (<20 API Gravity) (lbs/hr/component)	Light Oil (>20 API Gravity) (lbs/hr/component)	Water/Light Oil[2] (lbs/hr/component)
Connectors	4.41E-04	1.65E-05	4.63E-04	2.43E-04
Flanges	8.60E-04	8.60E-07	2.43E-04	6.39E-06
Open-ended Lines	4.41E-03	3.09E-04	3.09E-03	5.51E-04
Pumps	5.29E-03	0.00E+00	2.87E-02	5.29E-05
Valves	9.92E-03	1.85E-05	5.51E-03	2.16E-04
Other[1]	1.94E-02	7.05E-05	1.65E-02	3.09E-02

* - All factors are for total organic compound emission rates (includes non-VOC's such as methane and ethane).
1 - "Other" equipment type includes compressors, pressure relief valves, relief valves, diaphrams, drains, dump arms, hatches, instruments, meters, polished rods and vents.
2 - Water/Light Oil factors apply to water streams in oil service with a water content greater than 50% to 99% For streams with water content greater than 99%, the emission rate is considered negligable.
3 - The emission factor for pumps was not derived in the actual protocol, the factor for "other" has been substituted for completeness.

INPUTS:

1. List the quantity of each type of component in each type of service at the applicant's facility:

Component Type	Equipment Service Category			
	Gas	Heavy Oil (<20 API Gravity)	Light Oil (>20 API Gravity)	Water/Light Oil
Connectors	38	0	7	0
Flanges	5	0	1	0
Open-ended Lines	4	0	0	0
Pumps	0	0	0	0
Valves	15	0	10	0
Other	5	0	3	0

NOTE: The component count is estimated based on an LDAR site-specific count for "Like Kind" facility.

Sample Calculation:

TOC (TPY) = component quantity * component factor * 8,760 hr/yr * 1 ton/2,000 lb.s
VOC (TPY) = TOC * VOC Fraction from gas analysis (wt%)

Component Type	Equipment Service Category			
	Gas (TPY of TOC)	Heavy Oil (<20 API Gravity) (TPY of TOC)	Light Oil (>20 API Gravity) (TPY of TOC)	Water/Light Oil (TPY of TOC)
Connectors	0.072422	0.000000	0.014195	0.000000
Flanges	0.018830	0.000000	0.001062	0.000000
Open-ended Lines	0.082078	0.000000	0.000000	0.000000
Pumps	0.000000	0.000000	0.000000	0.000000
Valves	0.651797	0.000000	0.241406	0.000000
Other	0.446119	0.000000	0.217266	0.000000
TOTAL	**1.271245**	**0.000000**	**0.473929**	**0.000000**
Weight VOC Fraction	0.5825	0.00	1.00	1.00
Weight HAP Fraction	0.0709	0.00	0.033	0.033

Note: The weight fraction for HAPs in light oil service was estimated using Colorado emission factors for flash (Moffat County). EF for n-hexane was used for all other HAPs in Bin C.

TPY VOC	**0.74**	**0.00**	**0.47**	**0.00**
lb/hr VOC	0.17	0.00	0.11	0.00
TPY HAP	**0.09**	**0.00**	**0.02**	**0.00**
lb/hr HAP	0.02	0.00	0.00	0.00

Source	VOC		Total HAPs	
	(lb/hr)	(TPY)	(lb/hr)	(TPY)
Fugitives	**0.28**	**1.21**	**0.02**	**0.11**

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Gas Analysis Calculation Sheet

Based on: **Dry Piney Central Facility Gas Analysis**

Component	Mole %	Mole Frac.	Lb/Lb mole	MW	VOC	HAP	LHV BTU Content		HHV BTU Content	
							Btu/scf	Btu/scf*Mole Frac	Btu/scf	Btu/scf*Mole Frac
Carbon Dioxide	10.3907	0.1039	44.01	4.57			0.0	0.00	0.0	0.00
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00			586.8	0.00	637.1	0.00
Nitrogen	22.6175	0.2262	28.02	6.34			0.0	0.00	0.0	0.00
Methane	34.3748	0.3437	16.04	5.51			909.4	312.60	1010.0	347.19
Ethane	0.9145	0.0091	30.07	0.27			1618.7	14.80	1769.6	16.18
Propane	1.4181	0.0142	44.09	0.63	0.63		2314.9	32.83	2516.1	35.68
Isobutane	2.7479	0.0275	58.12	1.60	1.60		3000.4	82.45	3251.9	89.36
n-butane	7.5950	0.0760	58.12	4.41	4.41		3010.8	228.67	3262.3	247.77
Isopentane	5.0677	0.0507	72.15	3.66	3.66		3699.0	187.45	4000.9	202.75
n-pentane	5.8226	0.0582	72.15	4.20	4.20		3706.9	215.84	4008.9	233.42
Cyclopentane	0.0000	0.0000	70.08	0.00	0.00		3512.2	0.00	3763.4	0.00
n-hexane	3.0454	0.0305	86.18	2.62	2.62	2.62	4404.1	134.12	4750.2	144.66
Cyclohexane	0.3186	0.0032	84.18	0.27	0.27		4179.9	13.32	4481.2	14.28
Other Hexanes	3.3515	0.0335	86.18	2.89	2.89		4392.7	147.22	4744.5	159.01
Heptanes	1.6377	0.0164	100.21	1.64	1.64		5100.3	83.53	5500.4	90.08
Methylcyclohexane	0.1932	0.0019	98.19	0.19	0.19		4863.9	9.40	5215.7	10.08
2,2,4-Trimethylpentane	0.1481	0.0015	114.22	0.17	0.17	0.17	5779.1	8.56	6231.5	9.23
Benzene	0.0123	0.0001	78.11	0.01	0.01	0.01	3591.1	0.44	3741.5	0.46
Toluene	0.0161	0.0002	92.14	0.01	0.01	0.01	4273.7	0.69	4474.5	0.72
Ethylbenzene	0.0024	0.0000	106.17	0.00	0.00	0.00	4970.7	0.12	5221.7	0.13
Xylenes	0.0128	0.0001	106.17	0.01	0.01	0.01	4957.4	0.63	5208.4	0.67
C8+Heavies	0.3131	0.0031	315.00	0.99	0.99		5796.3	18.15	5794.1	18.14
Totals	**100.0000**	**1.0000**		**40.0006**	**23.3016**	**2.8342**		**1490.80**		**1619.81**

Fraction of Vapors that are VOC:	**0.5825**
Fraction of Vapors that are HAP:	**0.0709**
Gas Specific Gravity:	**1.3808**

Lesair Environmental, Inc.
www.lesair.com

QUESTAR APPLIED TECHNOLOGY

1210 D. Street, Rock Springs, Wyoming 82901

(307) 352-7292

LIMS ID:	N/A		Description:	Dry Piney Treater Vent
Analysis Date/Time:	4/30/2010	8:42 AM	Field:	Dry Piney
Analyst Initials:	PRP		ML#:	Wexpro
Instrument ID:	Instrument 1		GC Method:	Quesbtex
Data File:	QPC96.D			
Date Sampled:	4/29/2010			

Component	Mol%	Wt%	LV%
Methane	34.3748	14.0373	26.8067
Ethane	0.9145	0.7000	1.1283
Propane	1.4181	1.5917	1.7988
Isobutane	2.7479	4.0655	4.1382
n-Butane	7.5950	11.2365	11.0231
Neopentane	0.0489	0.0897	0.0862
Isopentane	5.0188	9.2171	8.4568
n-Pentane	5.8226	10.6933	9.7081
2,2-Dimethylbutane	0.0785	0.1723	0.1509
2,3-Dimethylbutane	0.3149	0.6907	0.5939
2-Methylpentane	1.8408	4.0379	3.5163
3-Methylpentane	1.1173	2.4508	2.0985
n-Hexane	3.0454	6.6802	5.7634
Heptanes	2.3260	5.6037	4.4004
Octanes	0.2654	0.7690	0.6121
Nonanes	0.0621	0.1940	0.1486
Decanes plus	0.0008	0.0028	0.0022
Nitrogen	22.6175	16.1276	11.4153
Carbon Dioxide	10.3907	11.6399	8.1522
Oxygen	0.0000	0.0000	0.0000
Hydrogen Sulfide	0.0000	0.0000	0.0000
Total	100.0000	100.0000	100.0000

Global Properties		Units
Gross BTU/Real CF	1636.4	BTU/SCF at 60°F and14.73 psia
Sat.Gross BTU/Real CF	1609.5	BTU/SCF at 60°F and14.73 psia
Gas Compressibility (Z)	0.9896	
Specific Gravity	1.3573	air=1
Avg Molecular Weight	39.287	gm/mole
Propane GPM	0.388648	gal/MCF
Butane GPM	3.285212	gal/MCF

Component	Mol%	Wt%	LV%
Benzene	0.0123	0.0246	0.0159
Toluene	0.0161	0.0378	0.0248
Ethylbenzene	0.0024	0.0065	0.0043
M&P Xylene	0.0105	0.0283	0.0186
O-Xylene	0.0023	0.0061	0.0040
2,2,4-Trimethylpentane	0.1481	0.4306	0.3425
Cyclopentane	0.0000	0.0000	0.0000
Cyclohexane	0.3186	0.6824	0.4991
Methylcyclohexane	0.1932	0.4828	0.3574
Description:	Dry Piney Treater Vent		

GRI GlyCalc Information

Component	Mol%	Wt%	LV%
Carbon Dioxide	10.3907	11.6399	8.1522
Hydrogen Sulfide	0.0000	0.0000	0.0000
Nitrogen	22.6175	16.1276	11.4153
Methane	34.3748	14.0373	26.8067
Ethane	0.9145	0.7000	1.1283
Propane	1.4181	1.5917	1.7988
Isobutane	2.7479	4.0655	4.1382
n-Butane	7.5950	11.2365	11.0231
Isopentane	5.0677	9.3068	8.5430
n-Pentane	5.8226	10.6933	9.7081
Cyclopentane	0.0000	0.0000	0.0000
n-Hexane	3.0454	6.6802	5.7634
Cyclohexane	0.3186	0.6824	0.4991
Other Hexanes	3.3515	7.3517	6.3596
Heptanes	1.6377	3.9455	3.1607
Methylcyclohexane	0.1932	0.4828	0.3574
2,2,4 Trimethylpentane	0.1481	0.4306	0.3425
Benzene	0.0123	0.0246	0.0159
Toluene	0.0161	0.0378	0.0248
Ethylbenzene	0.0024	0.0065	0.0043
Xylenes	0.0128	0.0344	0.0226
C8+ Heavies	0.3131	0.9249	0.7360
Subtotal	100.0000	100.0000	100.0000
Oxygen	0.0000	0.0000	0.0000
Total	100.0000	100.0000	100.0000

Waukesha

6-cyl. gas power units

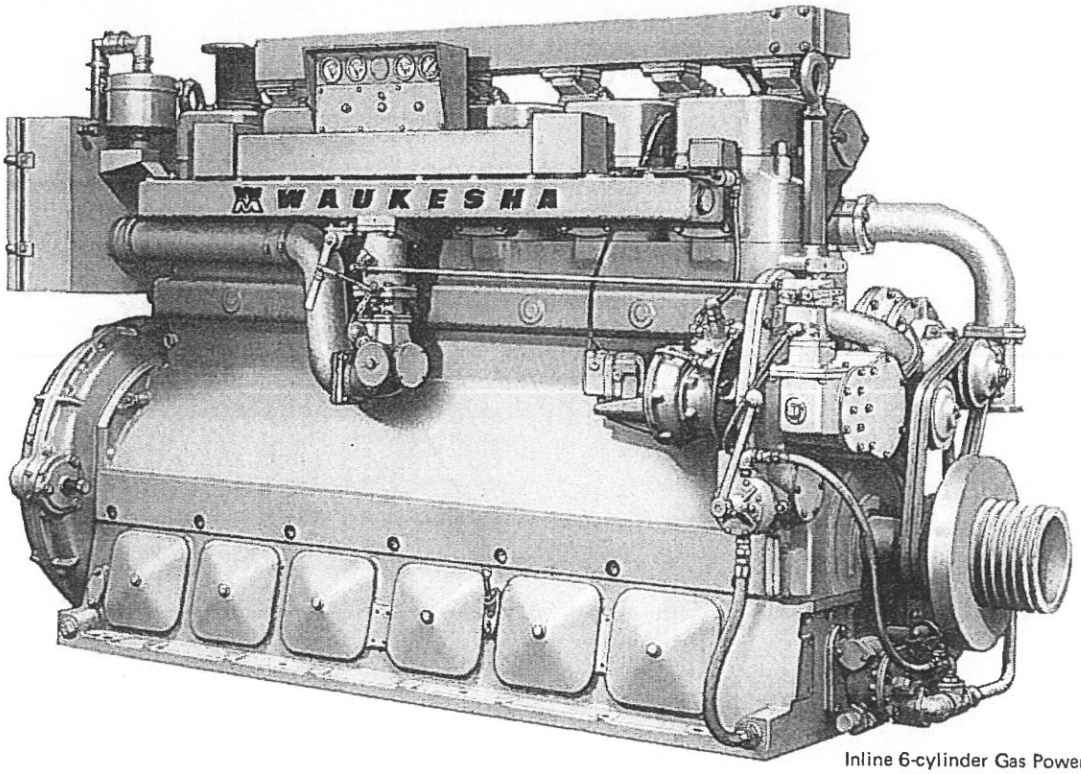
TURBOCHARGED & NAT. ASPIRATED

877 MAXIMUM HP RATING

VHP series

F2895

BULLETIN 5128



Inline 6-cylinder Gas Power Unit, 8-1/2 in. bore, naturally aspirated, Model F2895GU.

PRINCIPAL ENGINE DATA	MODEL F2895GU	MODEL F2895GSIU
Bore and stroke	8.5 In. x 8.5 In. (216 mm x 216 mm)	8.5 In. x 8.5 In. (216 mm x 216 mm)
Number of Cylinders	In-Line 6	In-Line 6
Displacement	2894 Cu. In. (47.4 l)	2894 Cu. In. (47.4 l)
Number of Main Bearings	7	7
Lube Oil System, Capacity		
Engine, not including lines and filters	43 Gals. (162.8 l)	43 Gals. (162.8 l)
Filters (mounted)	9 Gals. (34 l)	9 Gals. (34 l)
Jacket Water System, Capacity		
Engine without radiator	52.5 Gals. (198.7 l)	52.5 Gals. (198.7 l)
Engine with radiator – Cooling System Capacity varies with the size of the radiator required to cool the specified horsepower load. See Radiator Selection Chart, Codes and Dimensions S-5561.		
Weight, naturally aspirated	11200 Lbs. (5080 kg)	
Weight, turbocharged-intercooled		12200 Lbs. (5543 kg)
Weight, FCU gasoline starting unit	550 Lbs. (249 kg)	550 Lbs. (249 kg)

SPECIFICATIONS

Engine — In-line 6 overhead valve, 4-cycle gas engine.

Air Intake System — Cast aluminum intake manifold with dry, panel type air cleaner with rain shield and service indicator.

Barring Device — Hand.

Breather — Closed breather system.

Connecting Rod — Steel forging, angle-split for easy removal through cylinder liner. Serrated split line for precise cap alignment. Rifle drilled for full pressure piston pin lubrication and piston crown cooling.

Crankcase — Rigid one piece ferrous alloy casting with integral cylinder frame. Deep section main bearing caps cross-tie bolted to crankcase for extra rigidity.

Crankshaft — A multi-plane forging of high alloy steel, with precision ground and hardened main bearing and crankpin journals. Dynamically balanced. Generous overlap of main bearing and crankpin journals for increased crankshaft stiffness. Seven large diameter main bearings.

Cylinder Head — An interchangeable deep section casting, one for each cylinder. Four overhead valves per cylinder — dual stellite-faced intake valves and dual stellite-faced Inconel exhaust valves, 30° angle seat. Solid stellite valve seat inserts. Valve lifters with hydraulic push rods. Valve guides of ferrous alloy. Alloy iron rocker arms. Cylinder head gasket has laminated fire ring to seal combustion. Each head casting is rigidly mounted to crankcase by eight (8) 1 inch diameter high strength steel alloy studs.

Cylinder Liner — Removable wet type.

Engine Rotation — Counterclockwise when facing flywheel.

Exhaust System — Cast iron individual water cooled exhaust manifold with 5" (127 mm) vertical rear outlet with flexible stainless steel connection.

Flywheel and Ring Gear — Flywheel machined for Fawick 28CB525 external flange.

Flywheel Housing — SAE No. 00.

Fuel System — Carburetor, 4 in. (102 mm) natural gas updraft type with Fisher gas regulator.

Gear Train — Shaved gear teeth for more uniform loading and reduced gear noises.

Governor — Gear-driven, variable speed, hydraulic type. Friction throttle for speed setting.

Instrumentation Panel — Engine mounted including water temperature, oil temperature, oil pressure and compound pressure gauges, mechanical tachometer, ignition switch. Hourmeter is engine mounted.

Jacket Water System — High capacity, "V" belt driven centrifugal water pump. Thermostatic temperature regulation valves for rapid warm-up and uniform temperature control. Full flow by-pass for most effective coolant circulation during warm-up. Directional flow for controlled cylinder head cooling. Belt driven auxiliary water pump for circulation of water through oil cooler.

Oil Pan — Base type with access openings provide surface area to permit inspection, maintenance and removal of connecting rod and main bearings.

Lube Oil System — Full pressure system with high capacity gear-type pump. Externally adjustable relief valve for accurate pressure control. Full flow through lube oil cooler, shell and tube type. Full flow oil filter. Mounted. Hand primer pump.

Pistons — Heavy section contour ground oil cooled aluminum alloy with ni-resist top ring groove insert and floating piston pins.

Safety Controls — High water temperature, low oil pressure, mechanical fuel shut-off valve. Overspeed shutdown. Manual reset type.

Turbocharged-Intercooled Model — Model F2895GSIU has one (1) exhaust driven turbocharger, power limiter, vertical outlet, and one (1) air-to-water intercooler, gas pressure regulator with 25 lbs. maximum inlet pressure setting balance connections. Flexible exhaust connection. Intercooler water circulation provided by oil cooler pump. 20 psi gas required for full load operation.

Vibration Damper — Viscous type, mounted at front end of crankshaft.

OPTIONAL ACCESSORIES
(Available as original equipment when specified)

Controls — Woodward hydraulic and electric governors. Electric or pneumatic speed modulators. Main bearing high temperature shutdown. Waukesha Engomatic® Control System.

Cooling System — Radiator, heat exchanger, ebullient cooling.

Filter — Sweet or sour natural gas, sewage gas, not mounted.

POWER RATINGS

M = MAXIMUM C = CONTINUOUS

MODEL	COMPRESSION RATIO	INTERCOOLER INLET WATER TEMP°F	MAX. TORQUE @RPM	BRAKE HORSEPOWER AT SPEEDS INDICATED													
				600		700		800		900		1000		1100		1200	
				M	C	M	C	M	C	M	C	M	C	M	C	M	C
NATURAL GAS WITHOUT ACCESSORIES																	
F2895G	8.2:1		2349-400	266	200	308	231	347	260	385	289	417	313	446	335	470	353
F2895G†	10:1		2475-700	282	212	330	248	377	283	420	315	461	346	498	374	526	395
F2895GSI	8.2:1	85	3833-*	439	285	512	333	585	380	658	428	731	475	804	523	877	570
F2895GSI	8.2:1	130	3641-*	417	271	486	316	556	361	625	406	695	452	764	497	833	541
NATURAL GAS WITH ACCESSORIES																	
F2895GU	8.2:1		2310-400	261	196	302	227	339	254	375	281	404	303	430	323	450	338
F2895GU†	10:1		2430-700	277	208	324	243	369	277	410	308	448	336	482	362	506	380
F2895GSIU	8.2:1	85	3793-400	433	281	505	328	576	374	647	421	717	466	788	512	858	558
F2895GSIU	8.2:1	130	3609-400	412	268	480	312	547	356	615	400	682	443	748	486	814	529
HD-5 PROPANE WITHOUT ACCESSORIES																	
F2895G	8.2:1		2438-700	278	209	325	244	370	278	411	308	450	338	482	362	505	379
HD-5 PROPANE WITH ACCESSORIES																	
F2895GU	8.2:1		2392-700	273	205	319	239	362	272	401	301	437	328	466	350	485	364

† High Ratio Pistons for Best Fuel Economy. Use Dry Gas Having a High Methane Content.
S = Turbocharged I = Intercooled *Maximum Torque — Any Speed
Performance Curve Supplied on Request
Ratings are based on availability of 1000 BTU HHV gas. For natural gas having less than 1000 BTU HHV, see chart S3955 for percentage loss of horsepower. For sewage gas ratings consult Waukesha Motor Company.
Turbocharged-Intercooled Engines are suitable for operation on 110 Octane (MM) or higher gas. Ratings available for HD-5 Propane 95 Octane (MM) depending upon operating conditions and approved by Waukesha Motor Company.

RATING STANDARDS

MAXIMUM RATING: Maximum HP output of engine which can be demonstrated within 5% at the factory under standard conditions. Engine should not be applied at this rating without prior approval of Waukesha Motor Company, Engineering Division.
Ratings are corrected to sea level barometric pressure of 29.92" hg. and standard temperature of 60 F.

INTERMITTENT RATING: 90% of Maximum Rating. The HP and speed which can be applied under specific conditions of varying load and/or speed. This rating is used for standby, standby-continuous, and peaking applications. Some users prefer to operate for long periods in this higher HP range with full knowledge that this may result in higher maintenance.

CONTINUOUS RATINGS: The HP and speed which can be applied without reduction.

TURBOCHARGED — INTERCOOLED POWER OUTPUT SETTING: Power output will be set to the maximum load requirement at the specified RPM providing this load requirement is within the rating limits of the engine. When load is not specified for the intended speed, the engine will be set for the maximum continuous horsepower rating.

SPECIAL RATINGS: All published ratings of the Waukesha Motor Company are a general guide for a broad range of applications. Other ratings based on specific load applications and economic requirements are available upon receipt at the factory of detailed information.

DEDUCTIONS FOR ALTITUDE AND TEMPERATURE

Type of Engine	RATING		
	Maximum	Intermittent	Continuous
Naturally Aspirated	3% for each 1000' above sea level	3% for each 1000' above 1000' altitude	3% for each 1000' above 2000' altitude
	1% for each 10° over 60 F.	1% for each 10° over 80 F.	1% for each 10° over 100 F.
Turbocharged Intercooled	2% for each 1000' above sea level	2% for each 1000' above 1500' altitude	2% for each 1000' above 3000' altitude
	1% For Each 10° Over 100 F. Ambient Temperature		
	Deduct 1% for each 10° increase in intercooler water above 85 F. 130 F. MAXIMUM		

The manufacturer reserves the right to change or modify, without notice, the design, equipment specifications or ratings as herein set forth without incurring any obligation either with respect to engines previously sold or in the process of construction except where otherwise specifically guaranteed by the manufacturer.

Flywheel and Ring Gear — Flywheel machined to suit requirements.

Fuel Systems — Carburetor, combination HD-5 propane and natural gas, sewage gas.

Pistons — Natural gas, high ratio model F2895GU.

Power Take Off — Stub shaft for direct drive.

Starting — Air, electric, hydraulic, line voltage, model FCU gasoline starting unit.

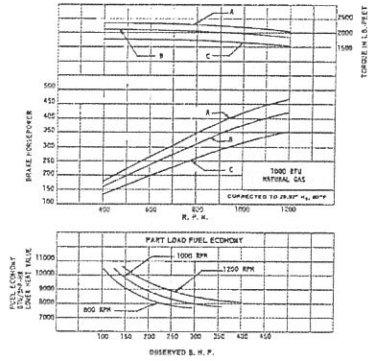
PERFORMANCE CURVES

Curve A: Maximum Rating
Curve B: Intermittent Rating
Curve C: Continuous Rating

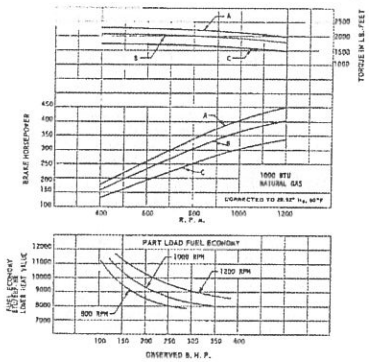
All ratings corrected to 29.92" Hg and 60° F.

Power Unit ratings (right hand column) show deductions for Air Cleaner and 60" diameter, 8 blade fan. All engine and power unit models equipped with 4" updraft carburetor.

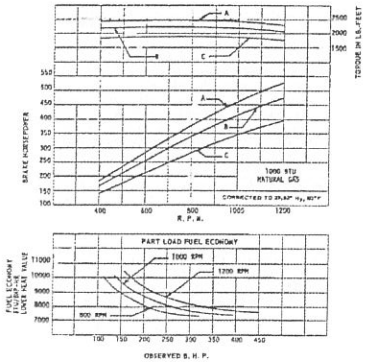
Model F2895G Engine Only
Naturally Aspirated
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



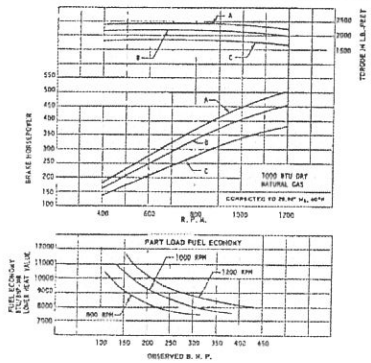
Model F2895GU Power Unit
Naturally Aspirated
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



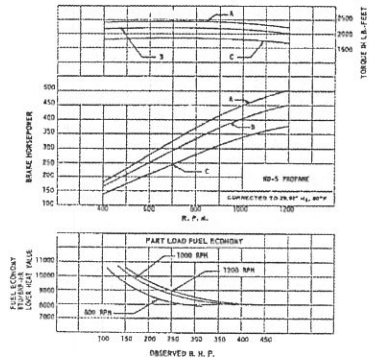
Model F2895G Engine Only
Naturally Aspirated
10:1 Compression Ratio — 1000 BTU HHV Natural Gas



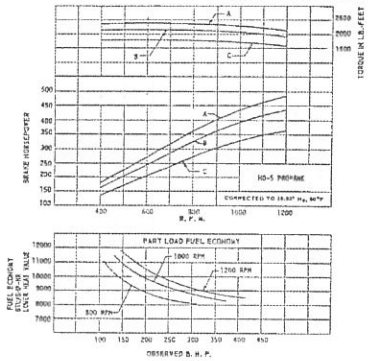
Model F2895GU Power Unit
Naturally Aspirated
10:1 Compression Ratio — 1000 BTU HHV Natural Gas



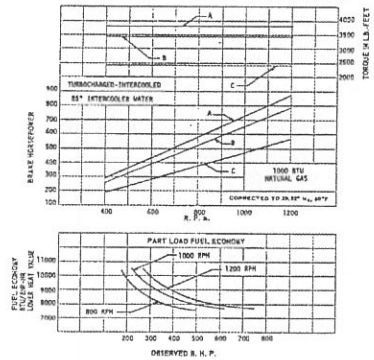
Model F2895G Engine Only
Naturally Aspirated
8.2:1 Compression Ratio — HD-5 Propane, 95 Octane (MM)



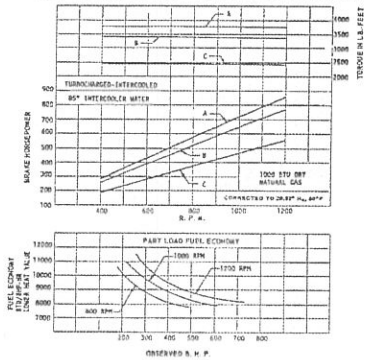
Model F2895GU Power Unit
Naturally Aspirated
8.2:1 Compression Ratio — HD-5 Propane, 95 Octane (MM)



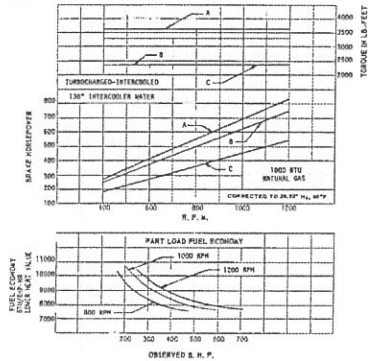
Model F2895GSI Engine Only
Turbocharged-Intercooled — 85° Intercooler Water
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



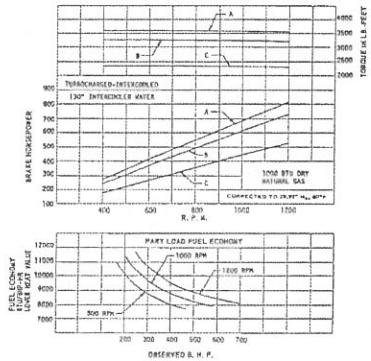
Model F2895GSIU Power Unit
Turbocharged-Intercooled — 85° Intercooler Water
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



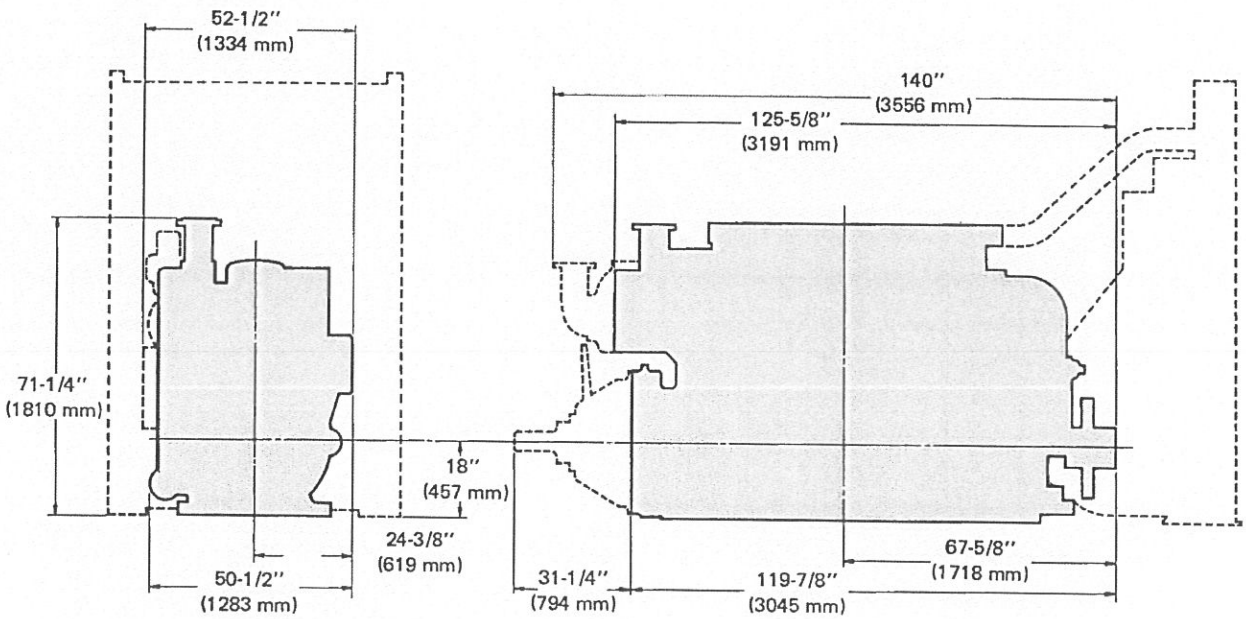
Model F2895GSI Engine Only
Turbocharged-Intercooled — 130° Intercooler Water
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



Model F2895GSIU Power Unit
Turbocharged-Intercooled — 130° Intercooler Water
8.2:1 Compression Ratio — 1000 BTU HHV Natural Gas



DIMENSIONS



Components and accessory locations and dimensions may vary with service and installation requirements. Dimensions not guaranteed. Detailed print available for layout work.

WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN 53186
Ridgewood, N.J. 07451 Houston, Tex. 77027 Tulsa, Okla. 74105 Downey, Calif. 90240 Anchorage Alas. 99502
A BANGOR PUNTA COMPANY

Bulletin 5128

6-71 Litho in U.S.A.

EmeraChem IC Engine Catalyst Sizing

Quote Reference Number: 150211-RJM-F2895G 21.5

Customer & Project Information

Date:	2/11/2015
Customer Name:	RJ Mann
Project Name:	Scott Day
Application Engineer:	Kevan Riebschlaeger

Engine Operating Data

Engine Make	Waukesha	
Engine Model	F2895G	
Fuel Type	NG	
Engine Horsepower	421	bhp
Engine Speed	1,200	rpm
Operating Hours	8760	hr/year
Combustion Cycle - 2 vs 4 cycle	4	
Lean Burn / Rich Burn	rich	

Engine Exhaust Flow Rate

Engine Exhaust Temperature	1038	F
Catalyst Operating Temperature	988	F
Exhaust Gas Flow Rate	42,006	scfh
Exhaust Gas Flow Rate	2,017	acfm
Exhaust Gas Flow Rate	3,192	lb/hr
Exhaust Gas Oxygen Concentration	0.3%	
Exhaust Gas Water Concentration	20.0%	

Engine Uncontrolled Emissions

	NOx	CO	NMNEHC	CH2O
g/bhp-hr	12	12	0.35	0.05
g/MW-hr	16,092	16,092		
g/hr	5,052	5,052	147	21
lb/hr	11.14	11.14	0.32	0.05
tons/year	48.78	48.78	1.42	0.20
MW	46.00	28.00	15.84	30.00
scfh	92	151	8	1
mg/Nm3	4,330	4,330	126	18
ppmv (wet; actual O2)	2,185	3,589	185	14
ppmv (dry; actual O2)	2,731	4,486	231	17
ppmv (dry; 15% O2)	782	1,285	66	13

Engine NMNEHC measured as Methane.

Note:
1) NMNEHC values referenced here include formaldehyde. If the engine emissions data sheet used as a source for this quote excludes formaldehyde in the NMNEHC calculation, the two values must be combined before entry into the performance requirements definition in this tool.

2) The NMNEHC content in the exhaust gas is assumed to be 15% by volume or less. If the concentration of propane is expected to be higher than this value, a specially designed catalyst is required.

Emissions Requirement

	NOx	CO	NMNEHC	CH2O
g/bhp-hr	0.7	1	0.15	0.02
g/MW-hr				
g/hr	295	421	63	8
lb/hr	0.65	0.93	0.14	0.02
tons/year	2.85	4.07	0.61	0.08
MW	46.00	28.00	15.84	30.00
scfh	5	13	3	0
mg/Nm3	253	361	54	7
ppmv (wet; actual O2)	127	299	79	6
ppmv (dry; actual O2)	159	374	99	7
ppmv (dry; 15% O2)	46	107	28	2

Stack NMNEHC measured as Methane.

Catalyst DRE Requirement (%)

NOx	CO	NMNEHC	CH2O
94.2	91.7	57.1	60.0

Catalyst Outlet For Chosen Module(s)

	NOx	CO	NMNEHC	CH2O	GHSV
resulting g/BHP-hr	0.12	0.49	0.03	0.00	
DRE	99.0	95.9	91.3	95.9	62,835

Catalyst Information

Catalyst Part Number:	EC-TW-PX-RO-2150-0000-3500	
Catalyst Type:	Performax NSCR	
Warranty (years)	3	
Catalyst Formulation	Performax	
New Install or Replacement	Replacement	
Catalyst Shape	Round	
Number of Catalyst Elements	1	
Modifications:	Without Bonnet	
CPSI	300	
Depth	3.5	inches
Diameter	21.500	inches
		inches
Catalyst Volume	0.74	ft3 (total)
Space Velocity	62,835	1/hr
Catalyst Weight	39.7	lb
Maximum Pressure Drop	10.0	in. H2O
Design Pressure Drop	2.1	in. H2O

Housing and Silencer Information

Housing Supplier:	EmeraChem
Housing Part Number	EC-2150-10-S-CS
Silencer Grade	
Silencer Attenuation	
Inlet Flange Size	10
Outlet Flange Size	10
Material	Carbon Steel
Trunion	
Housing Design Pressure Drop	0.2
Silencer Design Pressure Drop	0.0
Total Pressure Drop	2.3

Comments:

Company Name: **Wexpro Company**
Facility Name: **Dry Piney 18**

Attachment C

Baseline Emissions and Offsets Demonstration

Prepared for:
Wexpro Company

Prepared by:
Lesair Environmental, Inc.
www.Lesair.com

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Wyoming Air Quality Application Emission Summary Sheet - Baseline Emissions Estimation

2008 Baseline Controlled Production Equipment Emissions

			NOx		CO		SO2		Particulates		VOC		Total HAPs	
Ref No.	Equipment	Note	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 254 HP Caterpillar G398SITA Genset	a	0.56	2.45	0.56	2.45	0.00	0.01	0.02	0.10	0.11	0.49	0.03	0.12
002	(1) Thermo Electric Generator	b	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
003	Fugitives	c	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	1.21	0.02	0.11
	Total		**0.56**	**2.46**	**0.56**	**2.46**	**0.00**	**0.01**	**0.02**	**0.10**	**0.39**	**1.71**	**0.05**	**0.23**

NOTES:

a - Emission factors for NOx, CO and VOC were taken from WAQD BACT for a controlled engine using a catalyst. Other factors were calculated from AP-42 Table 3.2-3. Engine emissions ar based on the actual average 2006/2007 run hours of 7323 hours.

b - Burner emissions based on EPA AP-42 emission factors from Section 1.4, Tables 1.4-1 and 1.4-2 for uncontrolled natural gas burners, the worst case assumption that burners operate 8,760 hours per year, and a fuel heating value of 1490.8 Btu/SCF. Thermoelectric generator has existed at this location since 2006

c - Fugitive emissions account for VOC/HAP vapors from connections, valves, tank hatches, and relief vent/valves. Emission Factors derived from Table 2-4, EPA-453/R-95-017.

Company Name: **Wexpro Company**
Field: **Dry Piney**
Facility Name: **Dry Piney 18**

Baseline Emission Calculation for Natural Gas Fueled Engines (Controlled)

2006/2007 Baseline Emissions for Offsets Determination

(For Estimating Emissions, using factors supplied by the manufacturer or if no other data is available using AP-42 factors)

Engine Data

Reference No.	Site [1] Rating (HP)	Manufacturer	Model	Annual [2] Op Time (hours)	Fuel Type	Fuel Htg [3] Value (Btu/scf)	Emission Factor Source
001	254	Waukesha	F2895GU	8760	Field	1620	Manuf./AP-42

Notes: 1 - Site rating is based on the horsepower rating of the engine derated by the actual elevation of the facility
2 - Run hours based on historical permitted engine run hours for this engine (CT-3335A)
3 - Fuel heating value estimated from Dry Piney Central Facility Gas Analysis

Emission Factors (Uncontrolled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (lb/MMBtu)	CO (lb/MMBtu)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (lb/MMBtu)	HCHO (lb/MMBtu)
001	Waukesha F2895GU	254	2.21E+00	3.72E+00	5.88E-04	9.50E-03	2.96E-02	2.05E-02

Notes: 1 - All uncontrolled emission factors are based on AP-42 Table 3.2-3

Emission Factors (Controlled)

Reference No.	Equipment	Site Rating (HP)	Emission Factors					
			NOx (g/hp-hr)	CO (g/hp-hr)	SO2 (lb/MMBtu)	PM (lb/MMBtu)	VOC (g/hp-hr)	HCHO (g/hp-hr)
001	Waukesha F2895GU	254	1.0	1.0	5.88E-04	9.50E-03	0.20	0.05

Notes: 1 - NOx, CO, VOC and HCHO emission factors are those demonstrated in Permit C-3336.
All other EF's were calculated from AP-42 Table 3.2-3.

Baseline Source Emissions (Uncontrolled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895GU	5.09	22.30	8.57	37.54	0.00	0.01	0.02	0.10	0.07	0.30	0.05	0.21

Baseline Source Emissions (Controlled)

Reference No.	Equipment	Source Emissions											
		NOx		CO		SO2		PM		VOC		HCHO	
		(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
001	Waukesha F2895GU	0.56	2.45	0.56	2.45	0.00	0.01	0.02	0.10	0.11	0.49	0.03	0.12

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 18**

Demonstration of Creditable Offsets

2008 Baseline vs Proposed Emissions

DRY PINEY 20 MODIFICATION	NOx TPY	VOC TPY
Dry Piney 20 Baseline Emissions	2.46	2.32
Dry Piney 20 Proposed Emissions	2.77	2.92
DIFFERENCE	**0.31**	**0.60**

DRY PINEY 18 MODIFICATION	NOx TPY	VOC TPY
Dry Piney 18 Baseline Emissions	2.46	1.71
Dry Piney 18 Proposed Emissions	1.92	1.76
DIFFERENCE	**-0.53**	**0.06**

	NOx (tons)	VOC (tons)
Currently Banked Wexpro Emissions	0.7	9.6
Dry Piney 18 and 20 Emissions Change	-0.23	0.65
Offset Ratio	1.1:1	1.5:1
Total Offset Requirement	-0.25	0.98

SUBLETTE COUNTY PERMITTED EMISSIONS April 1, 2008 - PRESENT

company	field	facility	date of permit application	date of receipt	permit/waiver / AP #	Equipment Design / Current Actual Emissions (TPY)		Baseline Emissions (TPY)		Increase/decrease from baseline emissions (TPY)		VOC Offset Bank	NOx Offset Bank	Reason for Change
						VOC	NO_X	VOC	NO_X	VOC	NO_X			
Wexpro	Dry Piney	Dry Piney 35	10/22/2010			19.8	0.7	30.4	0.7	-10.6	0	-10.6	0.0	Swapped Kimray 4015 for crippled 2015 pump, accounted for additional HT pump
Wexpro	Dry Piney	Dry Piney Central Facility	4/3/2012			22.2	2.6	21.2	3.3	1	-0.7	1.5	-0.7	Equipment changes
Wexpro	Dry Piney	Dry Piney 20	2/13/2015			2.92	2.77	2.32	2.46	0.6	0.31	0.9	0.3	Proposed replacement engine
Wexpro	Dry Piney	Dry Piney 18	2/13/2015			1.76	1.92	1.71	2.46	0.05	-0.54	0.1	-0.5	Emissions reductions on existing engine being claimed
		Wexpro TOTAL				42	3.3	51.6	4	-9.6	-0.7	-8.13	-0.90	

Notes:

QUESTAR

Wexpro Company
1140 West 200 South
P.O. Box 45003
Salt Lake City, UT 84145-0003

Environmental & Safety Services

March 9, 2015

Mr. Steve Dietrich
Administrator
Air Quality Division
Herschler Building, 2E
122 W. 25th Street
Cheyenne, WY 82002

Re: Modification of Air Permits Nos. CT-3335 and CT-3336, and Disclosure of Past Permit Issues

Dear Mr. Dietrich:

In conjunction with the requested modification of Air Permits Nos. CT-3336 and CT-3335, (minor source Permits for the Dry Piney Unit 20 and Dry Piney Unit 18 well genset engines), Wexpro Company (Wexpro) provides the additional information contained herein regarding past issues with the existing Permits. By way of background, Air Permits CT-3336 and CT-3335 were issued to Wexpro in 2003. Both Permits identified the genset engines as 254 horsepower (hp) engines, despite the fact that both engines were actually larger. The engines were identified as 254 hp engines because both Wexpro and Wyoming DEQ understood that the electrical submersible pumps used at the wells acted as limiting factors on the engines.[1] The 254 hp description was included in both Permits, and presumably was used as the basis to calculate the Permits' emissions limits.

In the course of preparing the concurrently-submitted permit modification for Permit CT-3336, Wexpro discovered that the engines at Dry Piney Unit 20 and Unit 18 have, at times, exceeded 254 hp because of increased amp draw from the submersible pumps and power requirements of auxiliary equipment; including water pumps, oil pumps, and cooling fans, associated with the normal operations of the engines that were not accounted for in the existing permits.[2] However, based on Wexpro's analysis of

[1] At the time, both Wexpro (see 2003 permit application) and Wyoming DEQ (likely based on Wexpro's representations) understood that the Dry Piney 18 and 20 pumps could not be operated above 60 amps. That assumption was incorrect; both pumps could be (and have been) operated above 60 amps. In the permit-related correspondence, there also is some discussion about a 60 hertz limitation on the pumps. The 60 hertz limitation was also an incorrect assumption; the engines could operate above 254 hp and the pumps remain at 60 hertz.

[2] Wexpro also has learned that this engine equipment (water pump, oil pump, cooling fan, etc.) draws an estimated 15% of the engine's power. The Permit applications, and subsequent Permits, did not take this percentage amount into account. Therefore, the 254 hp description in the Permits was too low (by approximately 15%) to represent normal operation of the engines at a level sufficient to generate 60 amps for the pumps.

available information, it has concluded that while both engines operated above 254 hp at certain times, any associated emissions exceedances were, at most, minor.

Since discovering the discrepancies, Wexpro has analyzed its past emissions at Dry Piney 18 and 20 using two different methods: on a "permit" basis and an "engine test" basis. For the "permit" basis, Wexpro analyzed its possible emissions at Dry Piney 18 and 20 using the 1 gram per horsepower hour (gm/hp-hr) assumption made in the Permits, Wexpro's actual horsepower estimates, and actual operating hours. Using the 1 gm/hp-hr assumption for Dry Piney 18, it appears Wexpro may have, based on monthly averages, barely exceeded (by 0.01 to 0.10 lb/hr) the NOx and CO lb/hr limits, with the majority of the exceedances occurring in 2006 and 2007. Regardless, based on this same data, no exceedances of either the CO or NOx tons per year (TPY) emissions limits occurred at Dry Piney 18. Using the 1 gm/hp-hr assumption for Dry Piney 20, it appears Wexpro, based on monthly averages, could have barely exceeded (by 0.01 to 0.25 lb/hr) the NOx and CO lb/hr limits a number of times since 2003. Regardless, again using the "permit" basis, it appears that Dry Piney 20's TPY emissions limits were exceeded in only one year: 2012, by 0.28 tons.

Based on engine testing data since 2003 (with the exception of 2005 for which data was unavailable), Wexpro believes the 1 gm/hp-hr permit assumption over-predicts potential emissions and, as a result, the "permit" basis analyses are very conservative.[3] Using the 2003-2004 and 2006-2014 gm/hp-hr data obtained from required engine testing, as well as Wexpro's actual operating hours and horsepower estimates, Wexpro also estimated past actual emissions from Dry Piney 18 and 20. For Dry Piney 18, the "engine test" analysis, using a monthly average, indicates very minor exceedances between 0.02 and 0.04 lb/hr CO for three months in 2008 and no exceedances of either the NOx lb/hr or TPY limits. For Dry Piney 20, the "engine test" analysis indicates very minor (0.03 to 0.04) NOx lb/hr exceedances, on a monthly average, for six months in 2013, a single monthly average exceedance of 0.01 CO lb/hr in 2003, and no TPY exceedances.

Wexpro's requested modifications to Permits CT-3336 and CT-3335 will resolve any possible past non-compliance issues by simply using the maximum site rated horsepower for the engines for the NOx and CO emissions limits. Wexpro will also make changes in operations at both Dry Piney 18 and 20, (limiting engine operation to a maximum of 8242 hours per year), to obtain the required offsets. Wexpro will ensure that both engines stay under the annual hours' limitations by providing additional training to operations personnel on permit requirements and limitations, and by updating log sheets to not only include daily hours of operation for each engine, but to also clearly

---

[3] For example, while 1 gm/hp-hr of both CO and NOx is assumed for Dry Piney 20, Wexpro's review of the test data for 2003-2014 indicates that NOx ranged from 0.06-0.89 gm/hp-hr and CO ranged from 0.3-0.93 gm/hp-hr. At Dry Piney 18, Wexpro's review of the test data for 2003-2014 indicates that NOx ranged from 0.17-0.89 gm/hp-hr and CO ranged from 0.3-0.99 gm/hp-hr.

display permit limitations and any other pertinent information pertaining to compliance. In addition, the field supervisor will ensure the daily log sheets are sent to the Environmental Coordinator at the end of each month to verify the total hours the engines have run, and restrict, if necessary, future operations. Therefore, to the extent there have been any past exceedances of the permitted horsepower or emission limits at Dry Piney 20 and Dry Piney 18, those issues will be resolved with the modified Permits.

Wexpro appreciates the opportunity to clarify the issues regarding the operations of Dry Piney 20 and Dry Piney 18 under their existing Permits, as well as the opportunity to seek modified permits with clearer requirements that are consistent with Wexpro's other permits (which also rely on PTE). If you would like to discuss our analysis in more detail, I can be reached at (801) 324-3062.

Sincerely yours,

Tom Bradley
Sr. Environmental Engineer

Cc: Cole Anderson, Natural Resources Program Manager

Wexpro Company
Dry Piney Unit
Oil Well ESP Calculations

From Miles Stewart @ Dry Piney Unit Office:

Dry Piney Unit 18

Waukesha G2895GU

Volts	2400
Amps	60
PF	0.8
Efficiency	95
3 Phase	Yes
RPM	1200

From GPSA Engineering Data Book:

$$HP = \frac{1.73 * volts * amps * eff * PF}{746 * 100}$$

$$HP = \frac{1.73 * 2400 * 60 * 95 * 0.8}{746 * 100}$$

$$HP = 253.8$$

From Schlumberger/REDA:

Item 1060094
250 HP Pump Motor
$19,500.00

Dry Piney Unit 20

Caterpillar G398A

Volts	2400
Amps	60
PF	0.8
Efficiency	95
3 Phase	Yes
RPM	1200

From GPSA Engineering Data Book:

$$HP = \frac{1.73 * volts * amps * eff * PF}{746 * 100}$$

$$HP = \frac{1.73 * 2400 * 60 * 95 * 0.8}{746 * 100}$$

$$HP = 253.8$$

From Schlumberger/REDA:

Item 1060094
250 HP Pump Motor
$19,500.00

The State
of Wyoming

RECEIVED
MAR 0 6 2003
QUESTAR
MARKET RESOURCES

Department of Environmental Quality

Dave Freudenthal, Governor

Herschler Building • 122 West 25th Street • Cheyenne, Wyoming 82002

ADMIN/OUTREACH	ABANDONED MINES	AIR QUALITY	INDUSTRIAL SITING	LAND QUALITY	SOLID & HAZ. WASTE	WATER QUALITY
(307) 777-7758	(307) 777-6145	(307) 777-7391	(307) 777-7368	(307) 777-7756	(307) 777-7752	(307) 777-7781
FAX 777-3610	FAX 777-6462	FAX 777-5616	FAX 777-6937	FAX 777-5864	FAX 777-5973	FAX 777-5973

March 4, 2003

Mr. Jeffrey L. Ingerson
Sr. Environmental Specialist
Questar Gas Management Company
P.O. Box 45601
Salt Lake City, UT 84145-0601

Re: Permit Application No. AP-MF2

Dear Mr. Ingerson:

This letter is sent concerning your application (AP-MF2) to permit the genset engines at the Dry Piney 18 and 20 facilities. Per our phone conversations and an e-mail sent 10/14/2002, a signed statement stating when the controls were installed on the engines and how the engines are limited to their derated horsepower was to be submitted. According to my records this letter was never submitted. The permit or waiver can not be finalized until this information is received.

If you should have any questions you may contact me at (307) 777-7817.

Sincerely,

Brian Mitchell

Brian Mitchell
Air Quality Engineer
Air Quality Division

cc: Tony Hoyt, District Engineer

WELL	CONTROLS INSTALLED
DPU 18	12/12/02
DPU 20	10/10/02

QUESTAR

Jeffrey L. Ingerson
Senior Environmental Specialist
(801) 324-2653 Phone
(801) 324-2066 Fax

Wexpro Company
180 East 100 South
P.O. Box 45601
Salt Lake City, UT 84145-0601
Tel 801 324 2600
Fax 801 324 2637

April 10, 2003

Brian Mitchell
Wyoming Department of Environmental Quality
Division of Air Quality
122 West 25th Street
Cheyenne, Wyoming 82002

Dear Mr. Mitchell:

Re: Application AP-MF2
Dry Piney Units 18 and 20
Sublette Counties, Wyoming

Per your letter of March 4, 2003, Wexpro responds with the following information:

1) Installation dates for NSCR Systems:

Dry Piney Unit 18 Genset on 12.12.2002
Dry Piney Unit 20 Genset on 10.10.2002

2) Limitation of horsepower:

The electric submersible pumps used in these wells are equipped with a motor which has a *fixed* horsepower at 60 Hz. Wexpro keeps records of the size and serial number of these motor/pumps. The manufacturer informs us that the pump motors will be damaged if the electric input (read: generator engine output) exceeds 60 Hz. At a replacement cost of over $70,000 each, Wexpro has no incentive to speed-up the genset engine to deliver "more horsepower" to these units..

In addition, Wexpro maintains a log on each generator engine; on which we record voltage, amperage, and frequency (Hz). These parameters can be used to verify the horsepower being provided to the pump.

Should you have questions concerning this information, please feel free to contact me.

Sincerely,

Jeffrey L. Ingerson
for Wexpro Company

cc: Environmental Files: Dry Piney Units 18 & 20