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	-9.26	-0.10	-8.58	0.80	

Notes:

RECEIVED

JUL 07 2015

AIR QUALITY DIVISION

LESAIR ENVIRONMENTAL, INC.

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: A0000683; Dry Piney 20 Engine Driven Generator Replacement Incomplete Application Letter Follow-up Information

Ms. Boltz,

As discussed in our telephone call on May 4, 2015 and subsequent conversations, please find attached a completely revised application associated with a proposed generator replacement at the Dry Piney 20 (A0000683). This application proposes replacing the existing Caterpillar G398SITA engine driven generator with a Caterpillar G3412TA engine driven generator. This follow-up submittal corrects all of the known outstanding issues with 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 7,100 hours per year for the proposed Caterpillar G3412TA 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 20**

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) 425 HP Caterpillar G3412TA

Operating Status: Not Operating
Initial Construction Commencement Date: Pending
Initial Operation Commencement Date: Pending
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:

Request to install a replacement genset engine

Name Plate Rating: 566 Units: hp
Site Rating: 425 Units: hp
Primary Fuel Type: Field Gas
Secondary Fuel Type:
Model Name and Number: Caterpillar G3412TA
Engine Type: 4 Stroke Rich Burn
Serial Number Tracking Table:
Serial Number: unknown Order Date:
Manufacturer Name: Caterpillar
Construction/Installation Commencement Date: pending
Operation Commencement/ Start-up Date: pending
Manufacture Date: unknown
Btu Content: 1619.8 Units: BTU/scf
Fuel Sulfur Content: 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: 7100

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 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): Affected

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

NSPS Subpart: *Subpart JJJJ*

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): 2193.6

Inlet Gas Temp (F): 900 Outlet Gas Temp (F): 950

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)	87.4	0.5	gm/Hp-hr	0.47	1.7	PBACT
6.)	Carbon monoxide (CO)	6.2	1.0	gm/Hp-hr	0.94	3.3	NSCR
7.)	Volatile organic compounds (VOC)	1.2	0.3	gm/Hp-hr	0.28	1.0	NSCR
8.)	Lead (Pb)	NA	NA	NA	NA	NA	NA
9.)	Total Hazardous Air Pollutants (HAPs)	0.3	0.05	gm/Hp-hr	0.05	0.2	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	0.3	0.05		0.05	0.2	
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:

A replacement engine is being added to this facility, existing equipment is now being accounted for in 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.)							

Revised 1/22/2015

Specific Emission Unit Attributes:

Fugitives

Company Equipment ID:

Company Equipment Description: Fugitive Emissions

Operating Status: Operating

Initial Construction Commencement Date: 11/23/1971

Initial Operation Commencement Date: 11/23/1971

Most Recent Construction/ Modification Commencement Date: 11/23/1971

Most Recent Operation Commencement Date: 11/23/1971

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:

A replacement engine is being added to this facility.

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.

		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)	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
Catepillar G3412TA Genset	Release Point Latitude:	42.35338
	Release Point Longitude:	-110.39415
Company Release Point Description:	Base Elevation (ft):	8,862
Engine driven generator for purposes of power supply to equipment on location.	Stack Height (ft):	14.25
	Stack Diameter (ft):	0.67
	Exit Gas Velocity (ft/s):	36.56
	Exit Gas Temp (F):	950
	Exit Gas Flow Rate (acfm):	2193.6
Company Release Point ID:	Release Point Type:	Vertical
Thermoelectric Generator	Release Point Latitude:	42.35338
	Release Point Longitude:	-110.39415
Company Release Point Description:	Base Elevation (ft):	8,862
	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: 42.35338 Release Point Longitude: -110.39415 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 20**

Attachment B

Supporting Emissions Calculations

Prepared for:
Wexpro Company

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

Wexpro Company
Dry Piney Field
Dry Piney 20

Proposed Process Description

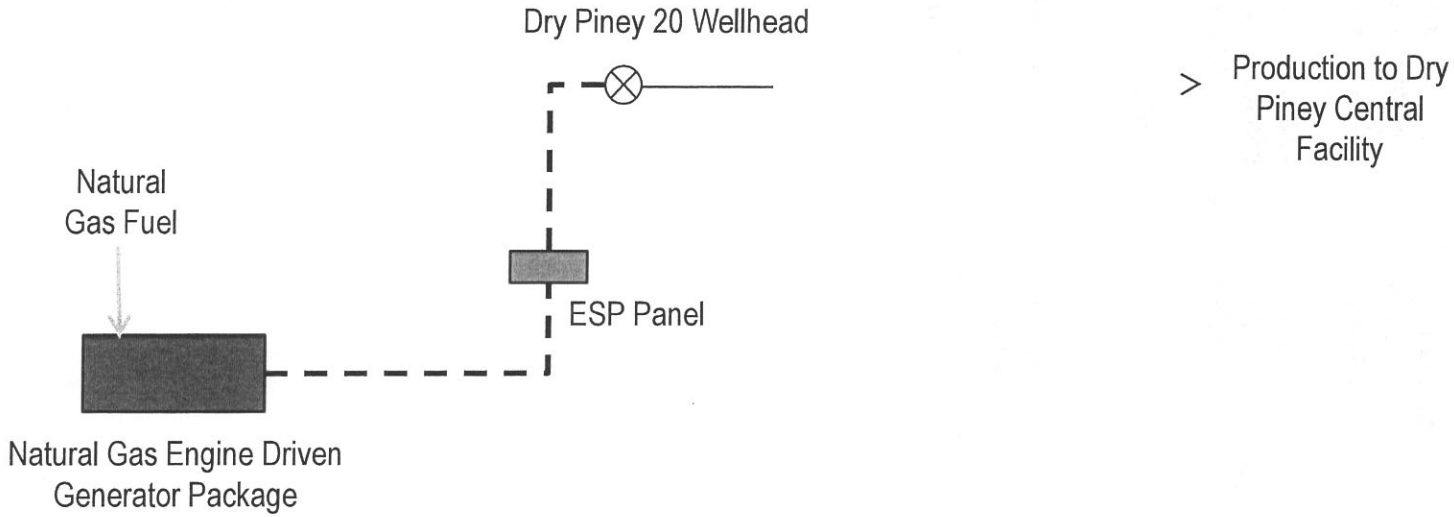
The commingled fluid stream (containing natural gas, condensate and produced water) is pumped from the well by use of an electric submersible pump. The comingled stream flows from the well location to a separate central facility for separation and processing.

Electric power for the electrical submersible pump (ESP) is provided by one (1) 425 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 20 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 20
Sublette County, WY
NWSE Sec 4, T27N, R114W
Latitude: 42.35338°
Longitude: -110.39415°
Elevation: 8,862'
-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 20**

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) 425HP Caterpillar G3412TA	a	0.47	1.66	0.94	3.33	0.00	0.01	0.03	0.10	0.28	1.00	0.05	0.17
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		**0.47**	**1.67**	**0.94**	**3.33**	**0.00**	**0.01**	**0.03**	**0.10**	**0.52**	**2.06**	**0.07**	**0.25**

NOTES:

a - Emission factors for Nox and CO were taken from WAQD BACT for a controlled engine using a catalyst. VOC EF from the manufacturer and all other factors were calculated from AP-42 Table 3.2-3. Emissions are based on reduced hours of 7,100 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 Name: **Dry Piney**
Facility Name: **Dry Piney 20**

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) 425HP Caterpillar G3412TA	a	19.96	87.41	1.41	6.16	0.00	0.01	0.03	0.13	0.28	1.23	0.06	0.28
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		**19.96**	**87.42**	**1.41**	**6.16**	**0.00**	**0.01**	**0.03**	**0.13**	**0.52**	**2.29**	**0.08**	**0.36**

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. 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 20**

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	425	Caterpillar	G3412TA	7100	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
See attached derate sheet for greater explaination.
2 - Requesting a run hour limitation of 7,100 hours per year to maintain compliance with the offset requirement.
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	Caterpillar G3412TA	425	21.3	1.5	5.88E-04	9.50E-03	0.30	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	Caterpillar G3412TA	425	0.5	1.0	5.88E-04	9.50E-03	0.30	0.05

Notes: 1 - NOx, CO emission factors are from WAQD BACT for a controlled engine, VOC EF from manufacturer, and 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	Caterpillar G3412TA	19.96	87.41	1.41	6.16	0.00	0.01	0.03	0.13	0.28	1.23	0.06	0.28

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	Caterpillar G3412TA	0.47	1.66	0.94	3.33	0.00	0.01	0.03	0.10	0.28	1.00	0.05	0.17

G3412 TA

GAS ENGINE TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED:	1800	FUEL:	NATURAL GAS
COMPRESSION RATIO:	9.7:1	FUEL SYSTEM:	LPG IMPCO
AFTERCOOLER (°F):	130		
JACKET WATER (°F):	210	MIN. FUEL PRESS. (psig):	1.5
COOLING SYSTEM:	COMBINED	MIN. METHANE NUMBER:	80
IGNITION SYSTEM:	CDIS	MAX. RATED ALTITUDE (ft):	2500
EXHAUST MANIFOLD:	WET	AT AMBIENT TEMP (°F):	77
COMBUSTION:	STOICH	NOx EMISSION LEVEL:	STD

RATING AND EFFICIENCY	NOTES	LOAD	100%	75%	50%
LHV OF FUEL		btu/scf	919.6	919.6	919.6
ENGINE POWER		bhp	566	425	283
ENGINE EFFICIENCY	(1)	%	35.0	32.9	29.0
THERMAL EFFICIENCY	(5)	%	51.5	54.3	58.2
TOTAL EFFICIENCY	(6)	%	86.5	87.1	87.2

ENGINE DATA					
FUEL CONSUMPTION	(1)	btu/bhp-hr	7266	7737	8780
AIR FLOW	(WET)	lb/hr	3997	2985	2039
AIR FLOW	(WET)	scfm	872	651	445
COMPRESSOR OUT PRESS.		in. Hg (abs)	46	43.9	39.5
COMPRESSOR OUT TEMP.		°F	186	165	151
INLET MAN. PRESS.		in. Hg (abs)	43.2	33	23.4
INLET MAN. TEMP.	(10)	°F	138	133	134
TIMING	(11)	°BTDC	26	26	26
EXHAUST STACK TEMP.		°F	892	885	882
EXHAUST FLOW (@STACK TEMP)	(WET)	cfm	2476	1846	1270
EXHAUST FLOW	(WET)	lb/hr	4202	3149	2163

EMISSIONS					
NOx (as NO2)	(9)	g/bhp-hr	21.3	22.4	21.2
CO	(9)	g/bhp-hr	1.5	1.6	1.6
THC	(9)	g/bhp-hr	1.9	1.9	2.6
NMHC	(9)	g/bhp-hr	0.29	0.29	0.39
EXHAUST O2 (DRY)		%	4.0	2.8	1.0
LAMBDA			1.22	1.14	1.03

HEAT BALANCE DATA					
LHV INPUT	(1)	btu/min	68547	54738	41411
HEAT REJ. TO JACKET	(2) (7)	btu/min	24869	21962	18786
HEAT REJ. TO A/C	(3) (8)	btu/min	866	436	166
HEAT REJ. TO ATMOSPHERE	(4)	btu/min	2742	2190	1656
HEAT REJ. TO EXH (LHV to 77°F)	(2)	btu/min	16067	12149	8801
HEAT REJ. TO EXH (LHV to 350°F)	(2)	btu/min	10412	7736	5322

CONDITIONS AND DEFINITIONS

ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1 (STD. REF. CONDITIONS OF 25°C, 100 KPA). NO OVERLOAD PERMITTED AT RATING SHOWN. CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE.

1) FUEL CONSUMPTION TOLERANCE ACCORDING TO ISO 3046/1. TOLERANCE IS ±5% OF FULL LOAD DATA
2) HEAT REJECTION TO JACKET AND EXHAUST TOLERANCE IS ±10% OF FULL LOAD DATA.
3) HEAT REJECTION TO A/C TOLERANCE IS ±5% OF FULL LOAD DATA.
4) HEAT REJECTION TO ATMOSPHERE TOLERANCE IS ±50% OF FULL LOAD DATA.
5) THERMAL EFFICIENCY: JACKET WATER +EXH. HEAT TO 350°F
6) TOTAL EFFICIENCY: ENGINE EFF. + THERMAL EFF. TOLERANCE IS +/- 10% OF FULL LOAD DATA
7) TOTAL JW HEAT: JACKET HEAT + OIL COOLER HEAT (HEAT RATE BASED ON TREATED WATER)
8) TOTAL A/C HEAT: A/C HEAT x A/C HEAT REJ. FACTOR (HEAT RATE BASED ON TREATED WATER)
9) EMISSION DATA SHOWN ARE NOT TO EXCEED VALUES.
PUBLISHED PART LOAD DATA MAY REQUIRE ENGINE ADJUSTMENT.
10) MEASURED BETWEEN AFTERCOOLER OUTLET AND PLENUM ENTRY.
11) TIMING INDICATED IS FOR USE WITH A MINIMUM FUEL METHANE NUMBER SPECIFIED. CONSULT THE APPROPRIATE FUEL USAGE GUIDE FOR TIMING AT OTHER METHANE NUMBERS.

G3412 TA

GAS ENGINE TECHNICAL DATA

CATERPILLAR ®

FUEL USAGE GUIDE

DERATE FACTOR/ENGINE TIMING vs METHANE NUMBER

<30	30	35	40	45	50	55	60	65	70	75	80 to 100
0	0/--	0/--	0/--	0/--	0/--	0/--	0/--	0/--	1.0/23	1.0/25	1.0/26

ALTITUDE DERATION FACTORS

AMBIENT (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1.00	0.96	0.93	0.89	0.86	0.83	0.79	0.76	0.73	0.70	0.68	0.65	0.62
120	1.00	0.98	0.94	0.91	0.87	0.84	0.81	0.78	0.75	0.72	0.69	0.66	0.63
110	1.00	1.00	0.96	0.92	0.89	0.86	0.82	0.79	0.76	0.73	0.70	0.67	0.64
100	1.00	1.00	0.98	0.94	0.91	0.87	0.84	0.80	0.77	0.74	0.71	0.68	0.66
90	1.00	1.00	1.00	0.96	0.92	0.89	0.85	0.82	0.79	0.76	0.73	0.70	0.67
80	1.00	1.00	1.00	0.98	0.94	0.90	0.87	0.83	0.80	0.77	0.74	0.71	0.68
70	1.00	1.00	1.00	0.99	0.96	0.92	0.88	0.85	0.82	0.78	0.75	0.72	0.69
60	1.00	1.00	1.00	1.00	0.97	0.94	0.90	0.87	0.83	0.80	0.77	0.74	0.71
50	1.00	1.00	1.00	1.00	0.99	0.96	0.92	0.88	0.85	0.82	0.78	0.75	0.72

ALTITUDE (FEET ABOVE SEA LEVEL)

AFTERCOOLER HEAT REJECTION FACTORS

AMBIENT (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	2.17	2.37	2.58	2.68	2.68	2.68	2.68	2.68	2.68	2.68	2.68	2.68	2.68
120	1.93	2.13	2.33	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43
110	1.69	1.89	2.09	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19
100	1.46	1.65	1.84	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94
90	1.22	1.41	1.60	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69
80	1.00	1.16	1.35	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
70	1.00	1.00	1.11	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

ALTITUDE (FEET ABOVE SEA LEVEL)

FUEL USAGE GUIDE:

This table shows the derate factor required for a given fuel and what engine timing to use. Note that deration occurs as the methane number decreases. Methane number is a scale to measure ignition and burning characteristics of various fuels. Representative values are shown below.

Methane	100.00
Ethane	44.00
Propane	34.00
n-Butane	10.00
Hydrogen	0.00

Most dry pipeline natural gas has a methane number of 67 or above. The gas quality should be analyzed to determine the percentage of each constituent and then determine the methane number. Consult the dealer or factory for assistance.

ALTITUDE DERATION FACTORS:

This table shows the deration required for various ambient temperatures and altitudes. Use this information to help determine actual engine power for your site.

ACTUAL ENGINE RATING:

It is important to note that the Altitude/Temperature deration and the Fuel Usage Guide deration are not cumulative, i.e., they are not to be added together. The same is true for the Low Energy Fuel deration (reference the Caterpillar Methane Number Program) and the Fuel Usage Guide deration. However, the Altitude/Temperature deration and Low Energy Fuel deration are cumulative; and they must be added together in the method shown below. To determine the actual power available, take the lowest rating between 1) and 2).

1) (Altitude/Temperature Deration) + (Low Energy Fuel Deration)
2) Fuel Usage Guide Deration

Note: For NA's always add the Low Energy Fuel deration to the Altitude/Temperature deration. For TA engines only add the Low Energy Fuel deration to the Altitude/Temperature deration whenever the Altitude/Temperature deration is less than 1.0 (100%). This will give the actual rating for the engine at the conditions specified.

AFTERCOOLER HEAT REJECTION FACTORS:

Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft altitude. To maintain a constant inlet air manifold temperature, as the ambient air temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shut down or fail.

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 20**

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	566	Caterpillar	G3412TA	8,862	100	0.744	425.0

Notes: 1 - Manufacturer maximum Hp rating comes from manufacturer literature rated at 100% load at sea level
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 by a power derating table provided by Caterpillar for this specific engine, derate factor was based on site specific elevation and air temperature.
4 - Site rating horsepower was rounded up to the nearest 5 horsepower.

Company Name: **Wexpro Company**
Field: **Dry Piney**
Facility Name: **Dry Piney 20**

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 SCF

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	425	Caterpillar	G3412TA	7100	Field	1620	7266	13.54

Notes: 1 - Site Rated Hp is estimated by derating manufacturer's maximum Hp by ~25% due to elevation (see G3412TA Derate sheet).
2 - Reduced run hours requested of 7,100 hours per year to maintain compliance with offset requirements.
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 20**

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]
001	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)
001	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)
001	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 20**

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	5	0	0	0
Pumps	0	0	0	0
Valves	15	0	10	0
Other	2	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	0.073387	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

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 20**

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

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

Company Name: **Wexpro Company**
Facility Name: **Dry Piney 20**

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	-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	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 20**

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	0.17	0.65	0.28	1.08	0.00	0.00	0.02	0.07	0.22	0.86	0.03	0.13
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		**0.17**	**0.66**	**0.28**	**1.08**	**0.00**	**0.00**	**0.02**	**0.07**	**0.47**	**1.92**	**0.05**	**0.22**

NOTES:

a - Emission factors for NOx and CO are based on average actual stack test results from 2006/2007. Run hours based on average actual run hours for 2006/2007. Other factors were either calculated from AP-42 Table 3.2-3 or from WAQD CT-3336A.

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 20**

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	6.66	25.62	6.77	26.05	0.00	0.00	0.02	0.07	0.22	0.86	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		**6.66**	**25.62**	**6.77**	**26.05**	**0.00**	**0.00**	**0.02**	**0.07**	**0.47**	**1.92**	**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.

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 20**

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	Caterpillar	G398SITA	7695	Field	1620	Manuf./AP-42	9.53

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 the average actual run hours from 2006/2007.
3 - Fuel heating value estimated from Dry Piney Central Facility Gas Analysis
4 - Fuel consumption based on 254 Hp, 7695 hrs/yr, and a BSFC of 7,900 Btu/Hp-Hr.

Emission Factors (Uncontrolled)

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 (lb/MMBtu)
001	Caterpillar G398SITA	254	11.90	12.10	5.88E-04	9.50E-03	0.40	2.05E-02

Notes: 1 - NOx, CO and VOC emission factors are from manufacturer information, all other 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	Caterpillar G398SITA	254	0.3	0.5	5.88E-04	9.50E-03	0.4	0.1

Notes: 1 - Nox and CO emission factors are an average from engine tests performed in 2006 and 2007.
2 - VOC and HCHO emission factors are those demonstrated in Permit CT-3336A.
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	Caterpillar G398SITA	6.66	25.62	6.77	26.05	0.00	0.00	0.02	0.07	0.22	0.86	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	Caterpillar G398SITA	0.17	0.65	0.28	1.08	0.00	0.00	0.02	0.07	0.22	0.86	0.03	0.13

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: A0000683; Dry Piney 20 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 20 engine replacement application (A0000683). 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 20**

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) 425 HP Caterpillar G3412TA

Operating Status: Not Operating

Initial Construction Commencement Date: Pending

Initial Operation Commencement Date: Pending

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:

Request to install a replacement genset engine

Name Plate Rating: 566 Units: hp

Site Rating: 425 Units: hp

Primary Fuel Type: Field Gas

Secondary Fuel Type:

Model Name and Number: Caterpillar G3412TA

Engine Type: 4 Stroke Rich Burn

Serial Number Tracking Table:

Serial Number: unknown Order Date:

Manufacturer Name: Caterpillar

Construction/Installation Commencement Date: pending

Operation Commencement/ Start-up Date: pending

Manufacture Date: unknown

Btu Content: 1619.8 Units: BTU/scf

Fuel Sulfur Content: 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 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): Affected

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

NSPS Subpart: *Subpart JJJJ*

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): 2193.6

Inlet Gas Temp (F): 900 Outlet Gas Temp (F): 950

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.

		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)	47.0	0.5	gm/Hp-hr	0.47	1.97	PBACT
6.)	Carbon monoxide (CO)	47.8	1.0	gm/Hp-hr	0.94	3.95	NSCR
7.)	Volatile organic compounds (VOC)	1.58	0.4	gm/Hp-hr	0.37	1.58	NSCR
8.)	Lead (Pb)	NA	NA	NA	NA	NA	NA
9.)	Total Hazardous Air Pollutants (HAPs)	0.27	0.05	gm/Hp-hr	0.05	0.2	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	0.27	0.05		0.05	0.20	
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:

A replacement engine is being added to this facility, existing equipment is now being accounted for in 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: 11/23/1971

Initial Operation Commencement Date: 11/23/1971

Most Recent Construction/ Modification Commencement Date: 11/23/1971

Most Recent Operation Commencement Date: 11/23/1971

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:

A replacement engine is being added to this facility.

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
Catepillar G3412TA Genset	Release Point Latitude: 42.35338
	Release Point Longitude: -110.39415
Company Release Point Description:	Base Elevation (ft): 8,862
Engine driven generator for purposes of power supply to equipment on location.	Stack Height (ft): 14.25
	Stack Diameter (ft): 0.67
	Exit Gas Velocity (ft/s): 36.56
	Exit Gas Temp (F): 950
	Exit Gas Flow Rate (acfm): 2193.6
Company Release Point ID:	Release Point Type: Vertical
Thermoelectric Generator	Release Point Latitude: 42.35338
	Release Point Longitude: -110.39415
Company Release Point Description:	Base Elevation (ft): 8,862
	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: 42.35338
Fugitives	Release Point Longitude: -110.39415
	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 20**

Attachment B

Supporting Emissions Calculations

Prepared for:
Wexpro Company

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

Proposed Process Description

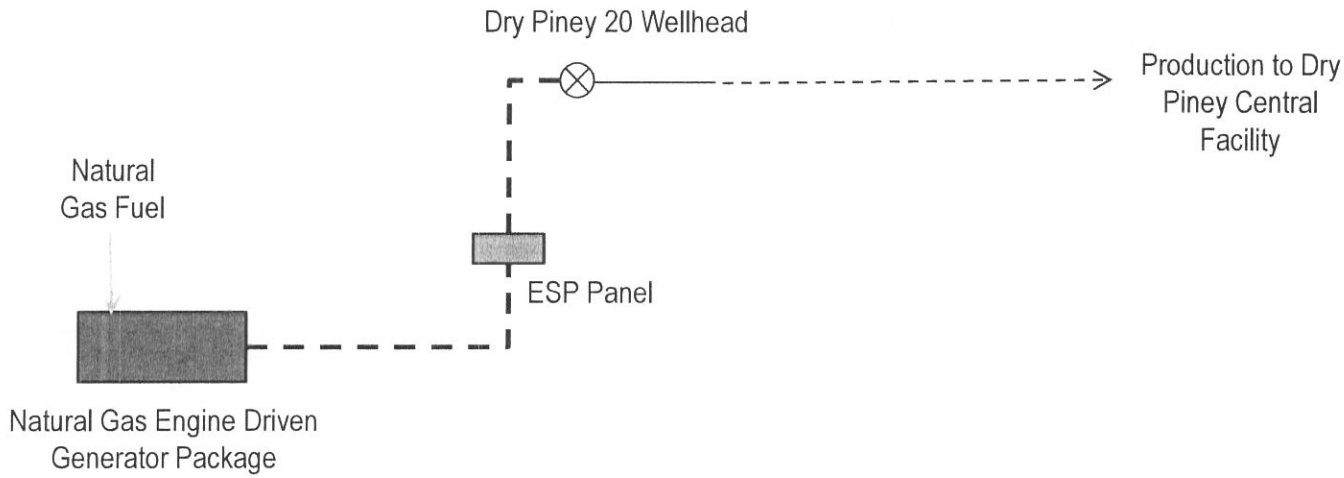
The commingled fluid stream (containing natural gas, condensate and produced water) is pumped from the well by use of an electric submersible pump. The comingled stream flows from the well location to a separate central facility for separation and processing.

Electric power for the electrical submersible pump (ESP) is provided by one (1) 425 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 20 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 20

Sublette County, WY
NWSE Sec 4, T27N, R114W
Latitude: 42.35338°
Longitude: -110.39415°
Elevation: 8,862'

-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 20**

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) 425HP Caterpillar G3412TA	a	0.47	1.97	0.94	3.95	0.00	0.01	0.03	0.12	0.37	1.58	0.05	0.20
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		**0.47**	**1.98**	**0.94**	**3.95**	**0.00**	**0.01**	**0.03**	**0.12**	**0.62**	**2.64**	**0.07**	**0.28**

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 20**

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) 425HP Caterpillar G3412TA	a	11.15	46.96	11.34	47.75	0.00	0.01	0.03	0.12	0.37	1.58	0.06	0.27
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		**11.15**	**46.97**	**11.34**	**47.76**	**0.00**	**0.01**	**0.03**	**0.12**	**0.62**	**2.64**	**0.08**	**0.35**

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. 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 20**

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	425	Caterpillar	G3412TA	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
See attached derate sheet for greater explaination.
2 - Run hours are the actual average run hours from 2006 and 2007 operations
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	Caterpillar G3412TA	425	11.9	12.1	5.88E-04	9.50E-03	0.40	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	Caterpillar G3412TA	425	0.5	1.0	5.88E-04	9.50E-03	0.40	0.05

Notes: 1 - NOx, CO emission factors are from WAQD BACT for a controlled 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	Caterpillar G3412TA	11.15	46.96	11.34	47.75	0.00	0.01	0.03	0.12	0.37	1.58	0.06	0.27

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	Caterpillar G3412TA	0.47	1.97	0.94	3.95	0.00	0.01	0.03	0.12	0.37	1.58	0.05	0.20

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 20**

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	566	Caterpillar	G3412TA	8,862	100	0.744	425.0

Notes: 1 - Manufacturer maximum Hp rating comes from manufacturer literature rated at 100% load at sea level
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 by a power derating table provided by Caterpillar for this specific engine, derate factor was based on site specific elevation and air temperature.
4 - Site rating horsepower was rounded up to the nearest 5 horsepower.

Company Name: **Wexpro Company**
Field: **Dry Piney**
Facility Name: **Dry Piney 20**

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 SCF

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	425	Caterpillar	G3412TA	8424	Field	1620	7266	16.06

Notes: 1 - Site Rated HP is estimated by derating manufacturer's maximum Hp by ~25% due to elevation (see G3412TA Derate 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.

G3412 TA

GAS ENGINE TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED:	1800	FUEL:	NATURAL GAS
COMPRESSION RATIO:	9.7:1	FUEL SYSTEM:	LPG IMPCO
AFTERCOOLER (°F):	130		
JACKET WATER (°F):	210	MIN. FUEL PRESS. (psig):	1.5
COOLING SYSTEM:	COMBINED	MIN. METHANE NUMBER:	80
IGNITION SYSTEM:	CDIS	MAX. RATED ALTITUDE (ft):	2500
EXHAUST MANIFOLD:	WET	AT AMBIENT TEMP (°F):	77
COMBUSTION:	STOICH	NOx EMISSION LEVEL:	STD

RATING AND EFFICIENCY	NOTES	LOAD	100%	75%	50%
LHV OF FUEL		btu/scf	919.6	919.6	919.6
ENGINE POWER		bhp	566	425	283
ENGINE EFFICIENCY	(1)	%	35.0	32.9	29.0
THERMAL EFFICIENCY	(5)	%	51.5	54.3	58.2
TOTAL EFFICIENCY	(6)	%	86.5	87.1	87.2

ENGINE DATA					
FUEL CONSUMPTION	(1)	btu/bhp-hr	7266	7737	8780
AIR FLOW	(WET)	lb/hr	3997	2985	2039
AIR FLOW	(WET)	scfm	872	651	445
COMPRESSOR OUT PRESS.		in. Hg (abs)	46	43.9	39.5
COMPRESSOR OUT TEMP.		°F	186	165	151
INLET MAN. PRESS.		in. Hg (abs)	43.2	33	23.4
INLET MAN. TEMP.	(10)	°F	138	133	134
TIMING	(11)	°BTDC	26	26	26
EXHAUST STACK TEMP.		°F	892	885	882
EXHAUST FLOW (@STACK TEMP)	(WET)	cfm	2476	1846	1270
EXHAUST FLOW	(WET)	lb/hr	4202	3149	2163

EMISSIONS					
NOx (as NO2)	(9)	g/bhp-hr	21.3	22.4	21.2
CO	(9)	g/bhp-hr	1.5	1.6	1.6
THC	(9)	g/bhp-hr	1.9	1.9	2.6
NMHC	(9)	g/bhp-hr	0.29	0.29	0.39
EXHAUST O2 (DRY)		%	4.0	2.8	1.0
LAMBDA			1.22	1.14	1.03

HEAT BALANCE DATA					
LHV INPUT	(1)	btu/min	68547	54738	41411
HEAT REJ. TO JACKET	(2) (7)	btu/min	24869	21962	18786
HEAT REJ. TO A/C	(3) (8)	btu/min	866	436	166
HEAT REJ. TO ATMOSPHERE	(4)	btu/min	2742	2190	1656
HEAT REJ. TO EXH (LHV to 77°F)	(2)	btu/min	16067	12149	8801
HEAT REJ. TO EXH (LHV to 350°F)	(2)	btu/min	10412	7736	5322

CONDITIONS AND DEFINITIONS

ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1 (STD. REF. CONDITIONS OF 25°C, 100 KPA). NO OVERLOAD PERMITTED AT RATING SHOWN. CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE.

1) FUEL CONSUMPTION TOLERANCE ACCORDING TO ISO 3046/1. TOLERANCE IS ±5% OF FULL LOAD DATA
2) HEAT REJECTION TO JACKET AND EXHAUST TOLERANCE IS ±10% OF FULL LOAD DATA.
3) HEAT REJECTION TO A/C TOLERANCE IS ±5% OF FULL LOAD DATA.
4) HEAT REJECTION TO ATMOSPHERE TOLERANCE IS ±50% OF FULL LOAD DATA.
5) THERMAL EFFICIENCY: JACKET WATER +EXH. HEAT TO 350°F
6) TOTAL EFFICIENCY: ENGINE EFF. + THERMAL EFF. TOLERANCE IS +/- 10% OF FULL LOAD DATA
7) TOTAL JW HEAT: JACKET HEAT + OIL COOLER HEAT (HEAT RATE BASED ON TREATED WATER)
8) TOTAL A/C HEAT: A/C HEAT x A/C HEAT REJ. FACTOR (HEAT RATE BASED ON TREATED WATER)
9) EMISSION DATA SHOWN ARE NOT TO EXCEED VALUES.
PUBLISHED PART LOAD DATA MAY REQUIRE ENGINE ADJUSTMENT.
10) MEASURED BETWEEN AFTERCOOLER OUTLET AND PLENUM ENTRY.
11) TIMING INDICATED IS FOR USE WITH A MINIMUM FUEL METHANE NUMBER SPECIFIED. CONSULT THE APPROPRIATE FUEL USAGE GUIDE FOR TIMING AT OTHER METHANE NUMBERS.

G3412 TA

GAS ENGINE TECHNICAL DATA

CATERPILLAR ®

FUEL USAGE GUIDE

DERATE FACTOR/ENGINE TIMING vs METHANE NUMBER

<30	30	35	40	45	50	55	60	65	70	75	80 to 100
0	0/--	0/--	0/--	0/--	0/--	0/--	0/--	0/--	1.0/23	1.0/25	1.0/26

ALTITUDE DERATION FACTORS

AMBIENT (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1.00	0.96	0.93	0.89	0.86	0.83	0.79	0.76	0.73	0.70	0.68	0.65	0.62
120	1.00	0.98	0.94	0.91	0.87	0.84	0.81	0.78	0.75	0.72	0.69	0.66	0.63
110	1.00	1.00	0.96	0.92	0.89	0.86	0.82	0.79	0.76	0.73	0.70	0.67	0.64
100	1.00	1.00	0.98	0.94	0.91	0.87	0.84	0.80	0.77	0.74	0.71	0.68	0.66
90	1.00	1.00	1.00	0.96	0.92	0.89	0.85	0.82	0.79	0.76	0.73	0.70	0.67
80	1.00	1.00	1.00	0.98	0.94	0.90	0.87	0.83	0.80	0.77	0.74	0.71	0.68
70	1.00	1.00	1.00	0.99	0.96	0.92	0.88	0.85	0.82	0.78	0.75	0.72	0.69
60	1.00	1.00	1.00	1.00	0.97	0.94	0.90	0.87	0.83	0.80	0.77	0.74	0.71
50	1.00	1.00	1.00	1.00	0.99	0.96	0.92	0.88	0.85	0.82	0.78	0.75	0.72

ALTITUDE (FEET ABOVE SEA LEVEL)

AFTERCOOLER HEAT REJECTION FACTORS

AMBIENT (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	2.17	2.37	2.58	2.68	2.68	2.68	2.68	2.68	2.68	2.68	2.68	2.68	2.68
120	1.93	2.13	2.33	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43
110	1.69	1.89	2.09	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19
100	1.46	1.65	1.84	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94
90	1.22	1.41	1.60	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69
80	1.00	1.16	1.35	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
70	1.00	1.00	1.11	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

ALTITUDE (FEET ABOVE SEA LEVEL)

FUEL USAGE GUIDE:

This table shows the derate factor required for a given fuel and what engine timing to use. Note that deration occurs as the methane number decreases. Methane number is a scale to measure ignition and burning characteristics of various fuels. Representative values are shown below.

Methane	100.00
Ethane	44.00
Propane	34.00
n-Butane	10.00
Hydrogen	0.00

Most dry pipeline natural gas has a methane number of 67 or above. The gas quality should be analyzed to determine the percentage of each constituent and then determine the methane number. Consult the dealer or factory for assistance.

ALTITUDE DERATION FACTORS:

This table shows the deration required for various ambient temperatures and altitudes. Use this information to help determine actual engine power for your site.

ACTUAL ENGINE RATING:

It is important to note that the Altitude/Temperature deration and the Fuel Usage Guide deration are not cumulative, i.e., they are not to be added together. The same is true for the Low Energy Fuel deration (reference the Caterpillar Methane Number Program) and the Fuel Usage Guide deration. However, the Altitude/Temperature deration and Low Energy Fuel deration are cumulative; and they must be added together in the method shown below. To determine the actual power available, take the lowest rating between 1) and 2).

1) (Altitude/Temperature Deration) + (Low Energy Fuel Deration)
2) Fuel Usage Guide Deration

Note: For NA's always add the Low Energy Fuel deration to the Altitude/Temperature deration. For TA engines only add the Low Energy Fuel deration to the Altitude/Temperature deration whenever the Altitude/Temperature deration is less than 1.0 (100%). This will give the actual rating for the engine at the conditions specified.

AFTERCOOLER HEAT REJECTION FACTORS:

Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft altitude. To maintain a constant inlet air manifold temperature, as the ambient air temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shut down or fail.

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 20**

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]
001	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)
001	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)
001	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 20**

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	5	0	0	0
Pumps	0	0	0	0
Valves	15	0	10	0
Other	2	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	0.073387	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

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 20**

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 20**

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	-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 20**

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	2.15	0.56	2.15	0.00	0.00	0.02	0.07	0.22	0.86	0.03	0.13
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**	**2.16**	**0.56**	**2.16**	**0.00**	**0.00**	**0.02**	**0.07**	**0.47**	**1.92**	**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.

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 20**

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	6.66	25.62	6.77	26.05	0.00	0.00	0.02	0.07	0.22	0.86	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		**6.66**	**25.62**	**6.77**	**26.05**	**0.00**	**0.00**	**0.02**	**0.07**	**0.47**	**1.92**	**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.
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 20**

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	Caterpillar	G398SITA	7695	Field	1620	Manuf./AP-42	9.53

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 run hours of 8760 (CT-3336)
3 - Fuel heating value estimated from Dry Piney Central Facility Gas Analysis
4 - Fuel consumption based on 254 Hp, 7695 hrs/yr, and a BSFC of 7,900 Btu/Hp-Hr.

Emission Factors (Uncontrolled)

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 (lb/MMBtu)
001	Caterpillar G398SITA	254	11.90	12.10	5.88E-04	9.50E-03	0.40	2.05E-02

Notes: 1 - NOx, CO and VOC emission factors are from manufacturer information, all other 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	Caterpillar G398SITA	254	1.0	1.0	5.88E-04	9.50E-03	0.40	0.06

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	Caterpillar G398SITA	6.66	25.62	6.77	26.05	0.00	0.00	0.02	0.07	0.22	0.86	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	Caterpillar G398SITA	0.56	2.15	0.56	2.15	0.00	0.00	0.02	0.07	0.22	0.86	0.03	0.13

QUESTAR

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

Environmental & Safety Services

February 20, 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 A0000683
IMP FID F002116

RE: CT-3336A; Dry Piney 20 Facility
Chapter 6, Section 2 Air Permit Application
NWSE Section 4, T27N, R114W
Sublette County, Wyoming

Ladies/Gentlemen:

Wexpro Company is submitting a permit application for a proposed replacement engine at the Dry Piney 20 facility. The existing 254 HP genset at this facility is currently authorized by permit CT-3336A (issued July 20, 2010). Wexpro proposes to install an engine with greater horsepower to be able to meet the demands of the facility. Wexpro also requests that engine run hours be limited to 8424 hours per year. This application serves to enter the additional sources at this location (thermoelectric generator and fugitive sources) into the WAQD IMPACT system.

The proposed engine is a 425 HP (site rated) Caterpillar G3412TA natural gas fueled genset with emissions controlled by a non-selective catalytic reduction (NSCR) catalyst and an air/fuel-ratio-controller (AFRC). The emissions associated with this engine are included in this permit application, along with the appropriate engine IMPACT form and cover sheet.

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-3336) 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. In addition to the changes at this facility, a new catalyst is being installed at the Dry Piney 18 facility to further reduce Wexpro's annual NOx emissions. The changes to the Dry Piney 18 facility are being demonstrated in a separate submittal, but creditable offsets for both the Dry Piney 18 and Dry Piney 20 are shown in Attachment C. 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.

After the final approval of this application, Wexpro will submit a letter to cancel permit CT-3336 for the existing engine at the Dry Piney 20 facility.

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 20**

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-3336A

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 20

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: 11/23/1971

Does production at this facility contain H2S?* No

If yes, contact the Division.

API Number(s): 49-035-20218

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: 42.35338 Longitude: -110.39415

Quarter Quarter: NWSE Quarter:

Section: 4 Township: 27N Range: 114

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) 425 HP Caterpillar G3412TA Genset

Operating Status: Not Operating
Initial Construction Commencement Date: Pending
Initial Operation Commencement Date: Pending
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:

Request to install a replacement genset engine

Name Plate Rating: 566 Units: hp
Site Rating: 425 Units: hp
Primary Fuel Type: Field Gas
Secondary Fuel Type:
Model Name and Number: Caterpillar G3412TA Genset
Engine Type: 4 Stroke Rich Burn
Serial Number Tracking Table:
Serial Number: unknown Order Date:
Manufacturer Name: Caterpillar
Construction/Installation Commencement Date: pending
Operation Commencement/ Start-up Date: pending
Manufacture Date: unknown
Btu Content: 1619.8 Units: BTU/scf
Fuel Sulfur Content: 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 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): Affected

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

NSPS Subpart: *Subpart JJJJ*

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:

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:

A replacement engine is being added to this facility, existing equipment is now being accounted for in 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.

Revised 1/22/2015

Specific Emission Unit Attributes:

Fugitives

Company Equipment ID:

Company Equipment Description: Fugitive Emissions

Operating Status: Operating

Initial Construction Commencement Date: 11/23/1971

Initial Operation Commencement Date: 11/23/1971

Most Recent Construction/ Modification Commencement Date: 11/23/1971

Most Recent Operation Commencement Date: 11/23/1971

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:

A replacement engine is being added to this facility.

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.

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): 2193.6

Inlet Gas Temp (F): 900 Outlet Gas Temp (F): 950

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
Catepillar G3412TA Genset	Release Point Latitude:	42.35338
	Release Point Longitude:	-110.39415
Company Release Point Description:	Base Elevation (ft):	8,862
Engine driven generator for purposes of power supply to equipment on location.	Stack Height (ft):	14.25
	Stack Diameter (ft):	0.67
	Exit Gas Velocity (ft/s):	36.56
	Exit Gas Temp (F):	950
	Exit Gas Flow Rate (acfm):	2193.6
Company Release Point ID:	Release Point Type:	Vertical
Thermoelectric Generator	Release Point Latitude:	42.35338
	Release Point Longitude:	-110.39415
Company Release Point Description:	Base Elevation (ft):	8,862
	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: 42.35338 Release Point Longitude: -110.39415 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 20**

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 will be powered by the use of one (1) 425 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 20 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 20
Sublette County, WY
NWSE Sec 4, T27N, R114W
Latitude: 42.35338°
Longitude: -110.39415°
Elevation: 8,862'
-NOT TO SCALE-

Drawn by: CAD	Date: 02/05/2015
Rev. by:	Date Rev:

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 20**

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) 425HP Caterpillar G3412TA Genset	a	11.14	46.92	11.33	47.71	0.00	0.01	0.03	0.13	0.37	1.58	0.07	0.28
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	0.31	1.34	0.03	0.11
	Total		**11.14**	**46.93**	**11.33**	**47.72**	**0.00**	**0.01**	**0.03**	**0.13**	**0.68**	**2.92**	**0.09**	**0.39**

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. 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 20**

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) 425HP Caterpillar G3412TA Genset	a	0.66	2.76	1.87	7.89	0.00	0.01	0.03	0.13	0.37	1.58	0.07	0.28
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	0.31	1.34	0.03	0.11
	Total		**0.66**	**2.77**	**1.87**	**7.89**	**0.00**	**0.01**	**0.03**	**0.13**	**0.68**	**2.92**	**0.09**	**0.39**

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: **Dry Piney**
Facility Name: **Dry Piney 20**

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	425	Caterpillar	G3412TA	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
See attached derate sheet for greater explaination.
2 - Run hours are the actual average run hours from 2006 and 2007 operations
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	Caterpillar G3412TA	425	11.9	12.1	5.88E-04	9.50E-03	0.40	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	Caterpillar G3412TA	425	0.7	2.0	5.88E-04	9.50E-03	0.40	2.05E-02

Notes: 1 - NOx, CO emission factors are from WAQD BACT for a controlled 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	Caterpillar G3412TA	11.14	46.92	11.33	47.71	0.00	0.01	0.03	0.13	0.37	1.58	0.07	0.28

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	Caterpillar G3412TA	0.66	2.76	1.87	7.89	0.00	0.01	0.03	0.13	0.37	1.58	0.07	0.28

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 20**

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	566	Caterpillar	G3412TA	8,862	100	0.746	425.0

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 by a power derating table provided by Caterpillar for this specific engine, derate factor was based on site specific elevation and air temperature.
4 - Site rating horsepower was rounded up to the nearest 5 horsepower.

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 20**

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]
001	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] ($Lb/MMFt^3$)
001	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)
001	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 20**

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	17	0
Flanges	5	0	2	0
Open-ended Lines	4	0	1	0
Pumps	0	0	0	0
Valves	15	0	14	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	0.033459	0.000000
Flanges	0.018830	0.000000	0.002390	0.000000
Open-ended Lines	0.082078	0.000000	0.016898	0.000000
Pumps	0.000000	0.000000	0.000000	0.000000
Valves	0.651797	0.000000	0.331933	0.000000
Other	0.446119	0.000000	0.217266	0.000000
TOTAL	**1.271245**	**0.000000**	**0.601946**	**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	0.60	0.00
lb/hr VOC	0.17	0.00	0.14	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	0.31	1.34	0.03	0.11

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 20**

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		

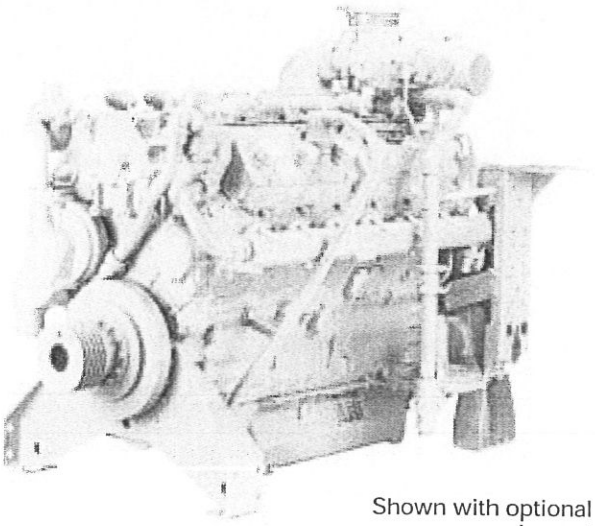
GRI GlyCalc Information

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

CATERPILLAR®

Gas Industrial Engine G3412

235-675 hp



Shown with optional equipment

SPECIFICATIONS

V-12, 4-Stroke-Cycle Gas
Bore—in (mm) 5.4 (137)
Stroke—in (mm) 6.0 (152)
Displacement—cu in (L) 1,649 (27)
Compression ratio
HCR 10:1
LCR 8.5:1
Jacket Water System
Capacity without radiator — gal (L) 20 (75)
Gas Pressure Requirements — psi (bar)
TA 20 (1.4)
NA ..... 1.5 (.1)
Lube Oil Capacity—gal (L) 50 (189)
Aspiration ..... Naturally Aspirated (NA) or Turbocharged-Aftercooled (TA)

FEATURES

■ DIESEL STRENGTH BUILT IN

All Caterpillar® Gas Engines are built on diesel frames which means greater service life. Caterpillar® Gas Engines inherit more from their diesel counterparts then just strength. They are backed by the same support system recognized as one of the most sophisticated and dependable in the world.

■ APPLICATION FLEXIBILITY

Constant torque over a large operating speed range and ability to burn a wide spectrum of gaseous fuels.

■ GAS ENGINES

Represent the latest technology in engine design and efficiency. Engines are offered in both naturally aspirated (NA) and turbocharged/aftercooled (TA) configurations with both high and low compression ratios.

- High energy ignition systems for consistent firing with many fuels.
- State-of-the-art combustion technology for improved fuel consumption.
- Modern componentry, designed and rigorously tested to provide excellent performance, reliability, and durability.

CONTINUOUS RATINGS (bhp)

Aspiration	1800 rpm*	1400 rpm
TA-90 HCR	675	525
TA-130 HCR	600	465
TA-90 LCR	625	495
TA-130 LCR	565	450
NA HCR	365	315

* Catalyst Ratings – approximately 10% less bhp than continuous ratings. Contact your Caterpillar dealer.

CATERPILLAR ENGINE FACILITIES ISO 9001 CERTIFIED

CATERPILLAR®

G3412 GAS INDUSTRIAL ENGINE

STANDARD EQUIPMENT

Air cleaners
  two stage, with rain cap and service indicator
Breather, crankcase
Carburetor, natural gas
Cooler, lubricating oil
Elbow, exhaust, dry
Filter, lubricating oil, bypass (TA only)
Flywheel housing, SAE No. 0
Governor, Woodward PSG
Ignition system Altronic III
Lifting eyes
Manifold, exhaust, watercooled
Paint, Caterpillar yellow
Pumps
  auxiliary water, gear driven, centrifugal
  non-self-priming (TA only)
  jacket water, gear driven
Regulator, gas pressure
SAE standard rotation
Service meter
Supports, engine
Thermostats and housing
Torsional vibration damper

OPTIONAL EQUIPMENT

Air cleaners and accessories
Bases and foundations
Controls and governors
Cooling systems, heat exchangers
  aftercooler groups
  expansion tank
CSA ignition (Class 1, Div 2, Gp D)
Dual timing magneto
Exhaust fittings
Fuel systems
Gauges & instrument panels
Mufflers
Protection devices
  oil pressure and coolant temperature contactors
Power takeoffs
Starting systems

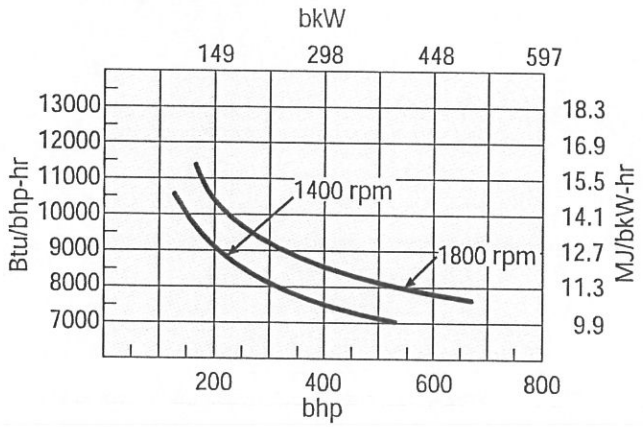
PHYSICAL FACTORS

	Length		Height		Width		Weight	
	in	mm	in	mm	in	mm	lb	kg
TA	80.7	2049	68.3	1734	63.1	1603	4720	2143
STD NA	76.3	1938	64.2	1631	49.8	1265	4420	2007

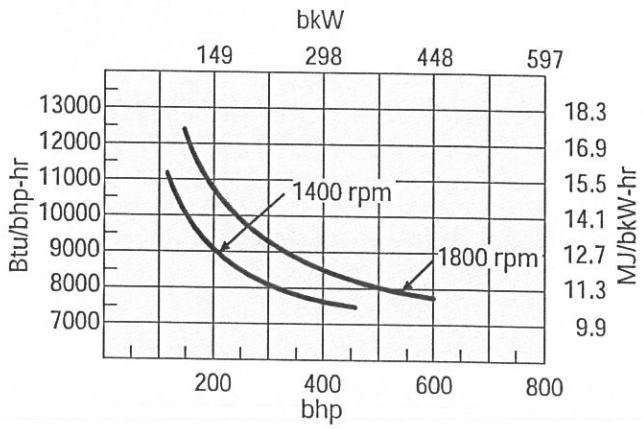
CATERPILLAR®

FUEL CONSUMPTION

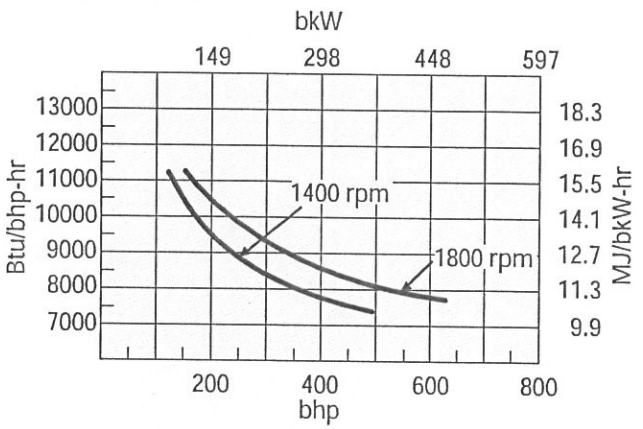
HCR TA-90



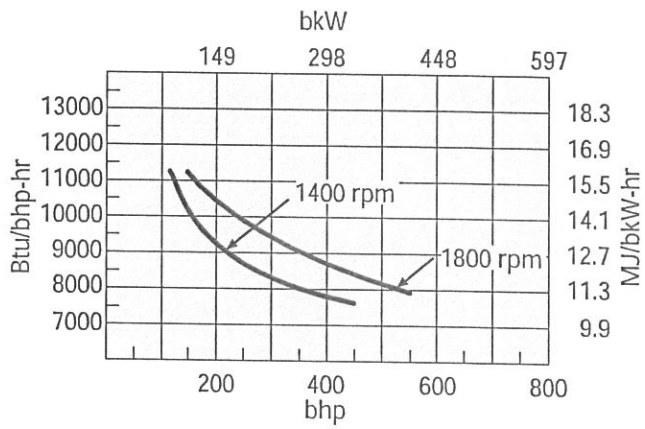
HCR TA-130



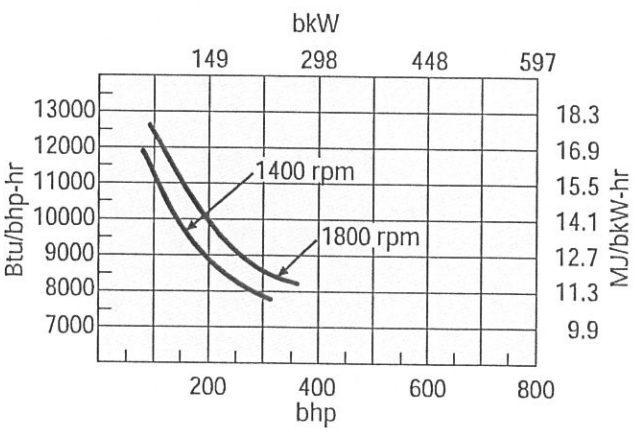
LCR TA-90



LCR TA-130



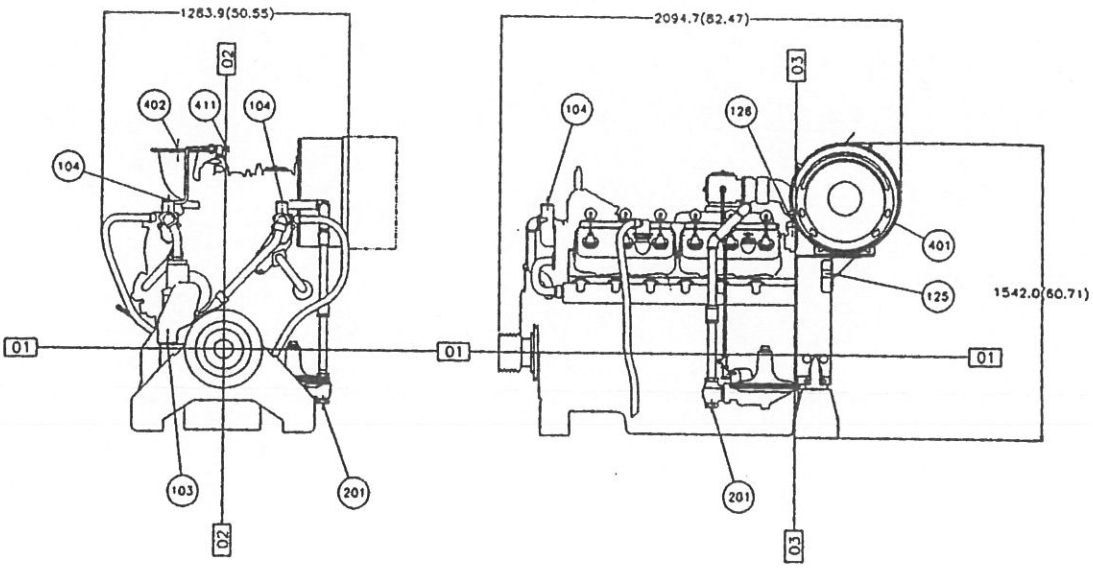
3412 NA



CATERPILLAR®

G3412 GAS INDUSTRIAL ENGINE

GAS INDUSTRIAL ENGINE



01	Centerline of Crankshaft	104	Jacket Water Outlet	401	Air Inlet
02	Centerline of Engine	125	Aftercooler Water Inlet	402	Exhaust
03	Rear Face of Cylinder Block	126	Aftercooler Water Outlet	411	Air Bleed Cooling System
103	Jacket Water Inlet	201	Fuel Inlet		

TA configuration shown. See General Dimension Drawing 7W0103 for additional detail.

Note: General configuration not to be used for installation.

RATING CONDITIONS AND DEFINITIONS

Ratings are based on SAE J1349 standard conditions of 29.61 in Hg (100 kPa) and 77° F (25° C). These ratings also apply at ISO3046, DIN6271, BS5514 standard conditions of 29.61 in Hg (100 kPa) 81° F (27° C); and API 7B-11C standard conditions of 29.38 in Hg (99 kPa) and 85° F (29° C) also apply.

Ratings are based on dry natural gas having an LHV (low heat valve) of 905 btu/cu ft (35.54 MJ/N m^3). Variations in altitude, temperature, and gas composition from standard conditions may require a reduction in engine horsepower.

Turbocharged-aftercooled ratings apply to 5,000 ft (1525 m) and 77° F (25° C).
Naturally aspirated engines apply to 500 ft (150 m) and 77° F (25° C). For applications which exceed these limits contact your Caterpillar dealer.

90 refers to aftercooler water inlet temperature in 90° F (32° C).

130 refers to aftercooler water inlet temperature in 130° F (54° C).

Additional ratings may be available for specific customer requirements. Consult your Caterpillar representative for details.

Materials and specifications are subject to change without notice.

The International System of Units (SI) is used in this publication.

LEHQ5415 (9-95)
Supersedes LEHQ3201

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EmeraChem IC Engine Catalyst Quote

Export XLS File

Quote Reference Number: 2113

Customer & Project Information

Date:	03Feb15
Customer Name:	Wexpro
Project Name:	3412TA Genset
EmeraChem Representative:	Scott Day

Engine Operating Data

Engine Make	Caterpillar	
Engine Model	3412TA	
Fuel Type	NG	
Engine Horsepower	450	bhp
Engine Speed	1800	rpm
Operating Hours	8400	hr / year
Combustion Cycle - 2 vs 4 cycle	4	
Lean Burn / Rich Burn	rich	

Engine Exhaust Flow Rate

Engine Exhaust Temperature	950	F
Catalyst Operating Temperature	900	F
Exhaust Gas Flow Rate	48540	scfh
Exhaust Gas Flow Rate	2193.64	acfm
Exhaust Gas Flow Rate	3689	lb/hr
Exhaust Gas Oxygen Concentration	0.4	
Exhaust Gas Water Concentration	20	

Engine Uncontrolled Emissions / Emissions Requirement

	Engine Uncontrolled Emissions				Emissions Requirement			
	NOx	CO	NMNEHC □	CH2O	NOx	CO	NMNEHC □	CH2O
NMNEHC Measured as:			Methane				Methane	
g/bhp-hr	11.9	12.1	.39	0	.7	1	.39	0
g/MW-hr	15958	16226	523	0	939	1341	523	0
g/hr	5355	5445	176	0	315	450	176	0
lb/hr	11.81	12.00	0.39	0.00	0.69	0.99	0.39	0.00
tons/year	49.58	50.42	1.62		2.92	4.17	1.62	0.00
MW	46.00	28.00	15.84	30.00	46.00	28.00	15.84	30.00
scfh	97	162	9	0	6	13	9	0
mg/Nm3	3992	4059	131	0	235	335	131	0
ppmv (wet; actual O2)	2004	3347	191	0	118	277	191	0
ppmv (dry; actual O2)	2505	4184	238	0	147	346	238	0
ppmv (dry; 15% O2)	721	1204	69	0	42	100	69	0

Catalyst DRE Percentage Requirement

NOx	CO	NMNEHC	CH2O
94.1	91.7	0	NaN

Catalyst DRE Percentage for Chosen Module(s)

NOx	CO	NMNEHC	CH2O
99	95.6	90.9	95.6

Catalyst Information

Catalyst Part Number	EC-TW-PX-RO-2150-0000-3500	
Catalyst Type	NSCR	
Warranty (years)	3	
Catalyst Formulation	Performax	
New Install or Replacement	Replacement	
Catalyst Shape	Round	
Modifications	Without Bonnet	
Number of Catalyst Elements	1	
Depth	3.5	inches
Diameter	21.5	inches
Catalyst Volume	0.74	ft3 (total)
Space Velocity	66012	1/hr
Maximum Pressure Drop	12	in. H2O
Design Catalyst Pressure Drop	1.9	in. H2O

Housing and Silencer Information

Housing Supplier	Other

Comments:

Company Name: **Wexpro Company**
Facility Name: **Dry Piney 20**

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 20**

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) 225 HP Caterpillar G398SITA Genset	a	6.66	29.16	6.77	29.65	0.00	0.01	0.03	0.13	0.22	0.98	0.06	0.28
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	0.31	1.34	0.03	0.11
	Total		**6.66**	**29.17**	**6.77**	**29.66**	**0.00**	**0.01**	**0.03**	**0.13**	**0.53**	**2.32**	**0.09**	**0.39**

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.

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 Name: **Dry Piney**
Facility Name: **Dry Piney 20**

Wyoming Air Quality Application Emission Summary Sheet - Baseline Emissions Estimation

2008 Baseline Controlled Production Equipment Emissions

Ref No.	Equipment	Note	NOx		CO		SO2		Particulates		VOC		Total HAPs	
			lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
001	(1) 225 HP Caterpillar G398SITA Genset	a	0.56	2.45	0.56	2.45	0.00	0.01	0.03	0.13	0.22	0.98	0.03	0.15
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	0.31	1.34	0.03	0.11
	Total		**0.56**	**2.46**	**0.56**	**2.46**	**0.00**	**0.01**	**0.03**	**0.13**	**0.53**	**2.32**	**0.06**	**0.26**

Permitted

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.
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 20**

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	Caterpillar	G398SITA	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 run hours of 8760 (CT-3336)
3 - Fuel heating value estimated from Dry Piney Central Facility Gas Analysis

Emission Factors (Uncontrolled)

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 (lb/MMBtu)
001	Caterpillar G398SITA	254	11.90	12.10	5.88E-04	9.50E-03	0.40	2.05E-02

Notes: 1 - NOx, CO and VOC emission factors are from manufacturer information, all other 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	Caterpillar G398SITA	254	1.0	1.0	5.88E-04	9.50E-03	0.40	0.06

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	Caterpillar G398SITA	6.66	29.16	6.77	29.65	0.00	0.01	0.03	0.13	0.22	0.98	0.06	0.28

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	Caterpillar G398SITA	0.56	2.45	0.56	2.45	0.00	0.01	0.03	0.13	0.22	0.98	0.03	0.15

Company Name: **Wexpro Company**
Field Name: **Dry Piney**
Facility Name: **Dry Piney 20**

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