ATTACHMENT 4

February 4, 2022

Air Permits Section, 6MM-AP
U.S. EPA, Region 6
1445 Ross Avenue
Dallas, Texas 752002-2733

Re: Application to Renew Title V Operating Permit Number R6FOP-NM-04-R2
Harvest Four Corners, LLC – Los Mestenios Compressor Station

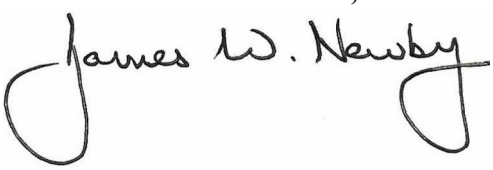
Dear Madam/Sir,

On behalf of Harvest Four Corners, LLC (Harvest), Cirrus Consulting, LLC submits the enclosed application to renew the Title V operating permit for the Los Mestenios Compressor Station, located within the exterior boundaries of the Jicarilla Apache Indian Reservation.

Thank you for your assistance. If you have questions or need any additional information, please contact Oakley Hayes of Harvest at (505) 632-4421.

Sincerely,

CIRRUS CONSULTING, LLC



James W. Newby

Attachment
Los Mestenios Compressor Station Title V Operating Permit Renewal Application

c: Oakley Hayes, Harvest

Cirrus Consulting, LLC
11139 Crisp Air Drive
Colorado Springs, Colorado 80908
Phone: (801) 294-3024
jnewby@cirrusllc.com

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U.S ENVIRONMENTAL PROTECTION AGENCY (REGION 6)
RENEWAL APPLICATION FOR PERMIT # R6FOP-NM-04-R2

LOS MESTENIOS COMPRESSOR STATION

Submitted By:

HARVEST FOUR CORNERS, LLC
1755 Arroyo Drive
Bloomfield, New Mexico 87413

Prepared By:

CIRRUS CONSULTING, LLC
11139 Crisp Air Drive
Colorado Springs, Colorado 80908
(801) 294-3024

February 2022

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Table of Contents

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Introduction

The Harvest Four Corners, LLC (Harvest) Los Mestenios Compressor Station currently operates under Part 71 Title V permit R6FOP-NM-04-R2, issued August 8, 2017. This application is being submitted to renew the Title V permit.

The Los Mestenios Compressor Station is a natural gas compressor station that accepts produced natural gas gathered from various wellheads from the gas field surrounding the facility, and compresses this gas for delivery to natural gas processing facilities. This is done on a contractual basis.

Under the existing Title V operating permit, the station is currently approved to operate a Solar Saturn T1200 natural gas fired turbine (Unit 1) and a Caterpillar G-399-TA 4 stroke rich burn (4SRB) reciprocating internal combustion engine (RICE) (Unit 2), both driving natural gas compressors. The existing permit also includes a 490-bbl condensate storage tank (Unit T1) for which both flash and working/breathing losses are estimated, a 400-bbl condensate tank (Unit T2) with working/breathing losses only, fugitive emissions from valves, flanges, etc. (Unit F1), startup, shutdown, and maintenance emissions (Unit SSM) and miscellaneous insignificant emission sources. Note that T2 is permitted to prevent overflows from T1 during times when haul truck access is limited due to outside factors such as weather and/or road conditions, and as such does not include flash losses.

In addition to renewing the Part 71 Title V permit, this application proposes to replace Unit 2, with a Waukesha L7042GL compressor engine and add one Scania DS11 diesel emergency generator (Unit 3). Note that the caterpillar engine is no longer operational and has been disconnected from the process.

The emergency generator was installed during the latter half of calendar year 2019; however, Harvest has not been able to find records indicating EPA was notified of startup. That being the case, this application is being used to provide notice of installation and startup.

On January 21, 2022, a letter was submitted to EPA Region 6 indicating that emissions at the Los Mestenios Compressor Station have dropped below the Title V major source thresholds. This occurred both because of the replacement of the Caterpillar G-399-TA engine, a Title V major source by itself, and because flash emissions from the condensate storage tank have been reduced. The emission rates identified in this application are below the Title V major source thresholds.

This renewal application is being submitted because EPA has not had a chance to review and approve the January 21, 2022 letter.

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Section 1

Application Forms

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)
GENERAL INFORMATION AND SUMMARY (GIS)

A. Mailing Address and Contact Information

Facility name: Los Mestenios Compressor Station

Mailing address: Street or P.O. Box 1755 Arroyo Drive

City: Bloomfield State: NM ZIP: 87413 -

Contact person: Oakley Hayes Title Environmental Specialist

Telephone: (505) 632-4421 Ext. _____

Facsimile: (505) 632-4782 Ext. _____

B. Facility Location

Temporary source? ___Yes _X_No Plant site location Section 2 5& 26, Township 26N, Range 5W (UTMH 292.3 km, UTMV 4,036.5 km, Zone 13)

City: ≈24 miles northwest of Gavilan State: NM County: Rio Arriba EPA Region: 6

Is the facility located within:

Indian lands? _X_ YES ___ NO An offshore source in federal waters? ___ YES _X_ NO

Non-attainment area? ___ YES _X_NO If yes, for what air pollutants? N/A

Within 50 miles of affected State? _X_ YES ___ NO If yes, what state(s)? CO

C. Owner

Name: Hilcorp Energy Company Street/P.O. Box: 1111 Travis Street

City: Houston State: TX ZIP: 77002 -

Telephone: (713) 289 - 2630 Ext: _____

D. Operator

Name: Harvest Four Corners, LLC Street/P.O. Box: 1755 Arroyo Drive

City: Bloomfield State: NM ZIP: 87413 - _____

Telephone: (505) 632 - 4600 Ext: _____

E. Application Type

Mark only one permit application type and answer the supplementary question appropriate for the type marked.

___ Initial Permit _X_ Renewal ___ Significant Mod ___ Minor Permit Mod(MPM)

___ Group Processing, MPM ___ Administrative Amendment

For initial permits, when did operations commence? ___/___/___

For permit renewal, what is the expiration date of current permit? _08_/_07_/_2022_

F. Applicable Requirement Summary

Mark the types of applicable requirements that apply:

___ SIP	_X_ FIP/TIP	___ PSD	___ Non-attainment NSR
___ Minor source NSR	_X_ Section 111	___ Phase I acid rain	___ Phase II acid rain
___ Stratospheric ozone	___ OCS regulations	___ NESHAP	___ Sec. 112(d) MACT
_X_ Sec. 112(g) MACT	___ Early reduction of HAP	___ Sec 112(j) MACT	___ RMP [Sec.112(r)]
___ Section 129	___ NAAQS, increments or visibility but for temporary sources (This is rare)		

Is the source subject to the Deepwater Port Act? ___ YES _X_ NO

Has a risk management plan been registered? ___ YES _X_ NO Agency: _____

Phase II acid rain application submitted? ___ YES _X_ NO If YES, Permitting Authority: _____

G. Source-Wide PTE Restrictions and Generic Applicable Requirements

Cite and describe any emissions-limiting requirements and/or facility-wide "generic" applicable requirements.

Not applicable.

H. Process Description

List processes, products, and SIC codes for the facility.

Process	Products	SIC
Natural Gas Compression	Natural Gas	1389
Condensate Storage	Natural Gas Condensate	1389

I. Emission Unit Identification

Assign an emissions unit ID and describe each emissions unit at the facility. Control equipment and/or alternative operating scenarios associated with emissions units should by listed on a separate line. Applicants may exclude from this list any insignificant emissions units or activities.

Emissions Unit ID	Description of Unit
1	Solar Saturn 1200 Turbine
2	Waukesha L7042GL Engine
3	Scania DS11 Diesel Engine
T1	490 bbl Condensate Storage Tank
T2	400 bbl Condensate Storage Tank
F1	Piping Component Fugitive Emissions
SSM	Startup, Shutdown & Maintenance

J. Facility Emissions Summary

Enter potential to emit (PTE) for the facility as a whole for each regulated air pollutant listed below. Enter the name of the single HAP emitted in the greatest amount and its PTE. For all pollutants, stipulations to major source status may be indicated by entering "major" in the space for PTE. Indicate the total actual emissions for fee purposes for the facility in the space provided. Applications for permit modifications need not include actual emissions information.

NOx _39.55_ tons/yr VOC _91.12_ tons/yr SO2 _0.24_ tons/yr

PM-10 _0.82_ tons/yr CO _45.73_ tons/yr Lead _0.00_ tons/yr

Total HAP _7.33_ tons/yr

Single HAP with greatest amount _n-Hexane_ PTE _3.83_ tons/yr

Total of regulated pollutants (for fee calculation), Sec. F, line 5 of form FEE _177.46_ tons/yr

K. Existing Federally-Enforceable Permits

Permit number(s) _R6FOP-NM-04-R2_ Permit type _Part 71_ Permitting authority _EPA_

Permit number(s) _____ Permit type _____ Permitting authority _____

L. Emission Unit(s) Covered by General Permits – Not Applicable

Emission unit(s) subject to general permit _____

Check one: ___ Application made ___ Coverage granted

General permit identifier _____ Expiration Date ____/____/____

M. Cross-referenced Information

Does this application cross-reference information? ___ YES _X_ NO (If yes, see instructions)

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)
EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID: _1_ Description: _Solar Saturn 1200 Turbine_

SIC Code (4-digit): _1389_ SCC Code_20200201_

B. Emissions Unit Description

Primary use: _Compressor Drive_ Temporary Source: ___Yes _X_No

Manufacturer: _Solar Turbines, Inc._ Model No.: _Saturn 1200_

Serial Number: _SC7895681_ Installation Date____/____/_1989_

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) _____

Boiler horsepower rating_____ Boiler steam flow (lb/hr)_____

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input __MM BTU/hr Max. Design Heat Input _10.84_MM BTU/hr

C. Fuel Data

Primary fuel type(s): _Natural Gas_ Standby fuel type(s): _Not Applicable_

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Natural Gas	Negligible	Negligible	900 Btu/cf

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Natural Gas	Not Applicable	12,044 scf	105.51 MMscf

E. Associated Air Pollution Control Equipment – Not Applicable

Emissions unit ID_____ Device type_____

Air pollutant(s) Controlled_____ Manufacturer_____

Model No._____ Serial No._____

Installation date_____/_____/_____ Control efficiency (%) _____

Efficiency estimation method_____

F. Ambient Impact Assessment – Not Applicable

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) _____._____ Inside stack diameter (ft) _____._____

Stack temp (°F) _____._____ Design stack flow rate (ACFM) _____.____

Actual stack flow rate (ACFM) _____.____ Velocity (ft/sec) _____._____

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)
EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID: _2_ Description: _Waukesha L7042GL_

SIC Code (4-digit): _1389_ SCC Code_20200202_

B. Emissions Unit Description

Primary use: _Compressor Drive_ Temporary Source: ___Yes _X_No

Manufacturer: _Waukesha_ Model No.: _L7042GL_

Serial Number: _TBD_ Installation Date____/____/_TBD_

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) _____

Boiler horsepower rating_____ Boiler steam flow (lb/hr)_____

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input __MM BTU/hr Max. Design Heat Input _10.58_MM BTU/hr

C. Fuel Data

Primary fuel type(s): _Natural Gas_ Standby fuel type(s): _Not Applicable_

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Natural Gas	Negligible	Negligible	900 Btu/cf

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Natural Gas	Not Applicable	10,912 scf	95.59 MMscf

E. Associated Air Pollution Control Equipment - Not Applicable

Emissions unit ID_____ Device type_____

Air pollutant(s) Controlled_____ Manufacturer_____

Model No._____ Serial No._____

Installation date_____/_____/_____ Control efficiency (%) _____

Efficiency estimation method_____

F. Ambient Impact Assessment – Not Applicable

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) _____._____ Inside stack diameter (ft) _____._____

Stack temp (°F) _____._____ Design stack flow rate (ACFM) _____.____

Actual stack flow rate (ACFM) _____.____ Velocity (ft/sec) _____._____

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)
EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID: _3_ Description: _Scania DS11_

SIC Code (4-digit): _1389_ SCC Code_20200202_

B. Emissions Unit Description

Primary use: _Emergency Generator Engine_ Temporary Source: ___Yes _X_No

Manufacturer: _Waukesha - Scania_ Model No.: _F674DSU - DS11A06_

Serial Number: _951674_ Installation Date____/____/_1970-1995_

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) _____

Boiler horsepower rating_____ Boiler steam flow (lb/hr)_____

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input ___MM BTU/hr Max. Design Heat Input _0.69_MM BTU/hr

C. Fuel Data

Primary fuel type(s): _Diesel_ Standby fuel type(s): _Not Applicable_

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Diesel	≤0.0015%	Unknown	138,000 Btu/gal

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Diesel	Not Applicable	5 gal	2,500 gal

E. Associated Air Pollution Control Equipment – Not Applicable

Emissions unit ID_____ Device type_____

Air pollutant(s) Controlled_____ Manufacturer_____

Model No._____ Serial No._____

Installation date_____/_____/_____ Control efficiency (%) _____

Efficiency estimation method_____

F. Ambient Impact Assessment – Not Applicable

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) _____._____ Inside stack diameter (ft) _____._____

Stack temp (°F) _____._____ Design stack flow rate (ACFM) _____.____

Actual stack flow rate (ACFM) _____.____ Velocity (ft/sec) _____._____

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)

EMISSIONS UNIT DESCRIPTION FOR VOC EMITTING SOURCES (EUD-2)

A. General Information

Emissions unit ID _T1_ Description _490-bbl Condensate Storage Tank_

SIC Code (4-digit) _1389_ SCC Code _40400311_

B. Emissions Unit Description

Equipment type _Condensate Storage Tank_ Temporary source: ___ Yes _X_ No

Manufacturer _Permian_ Model No. _N/A_

Serial No. _25428_ Installation date _Unknown (Manufacture Date 1993)_

Articles being coated or degreased _N/A_

Application method _N/A_

Overspray (surface coating) (%) _N/A_ Drying method _N/A_

No. of dryers _N/A_ Tank capacity (degreasers) (gal) _N/A_

C. Associated Air Pollution Control Equipment – Not Applicable

Emissions unit ID _____ Device Type_____

Manufacturer _____ Model No_____

Serial No. _____ Installation date ____/____/_____

Control efficiency (%) _____.___ Capture efficiency (%) _____.___

Air pollutant(s) controlled_____ Efficiency estimation method _____

D. Ambient Impact Assessment – Not Applicable

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) _____._____ Inside stack diameter (ft) _____._____

Stack temp (F) _____._____ Design stack flow rate (ACFM) _____._____

Actual stack flow rate (ACFM) _____ Velocity (ft/sec) _____._____

E. VOC-containing Substance Data

List each VOC-containing substance consumed, processed or produced at the emissions unit that is emitted into the air. In the name column, if providing a brand name, include the name of the manufacture; if the substance contains HAP, list the constituent HAP.

Substance Name (Chemical, Brand Name)	CAS No.	Substance Type	Actual Usage (gal/yr)	Max Usage (gal/day)	Max Usage (gal/year)	VOC Content (lb/gal)
Natural Gas Condensate	N/A	Natural Gas Condensate	N/A	2,548	929,922	5.7

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)

EMISSIONS UNIT DESCRIPTION FOR VOC EMITTING SOURCES (EUD-2)

A. General Information

Emissions unit ID _T2_ Description _400 bbl Condensate Storage Tank_

SIC Code (4-digit) _1389_ SCC Code _40400311_

B. Emissions Unit Description

Equipment type _Condensate Storage Tank_ Temporary source: ___ Yes _X_ No

Manufacturer _Permian_ Model No. _N/A_

Serial No. _831-2918_ Installation date _2014 (Manufacture Date 1965)_

Articles being coated or degreased _N/A_

Application method _N/A_

Overspray (surface coating) (%) _N/A_ Drying method _N/A_

No. of dryers _N/A_ Tank capacity (degreasers) (gal) _N/A_

C. Associated Air Pollution Control Equipment – Not Applicable

Emissions unit ID _____ Device Type_____

Manufacturer _____ Model No_____

Serial No. _____ Installation date ____/____/_____

Control efficiency (%) _____.___ Capture efficiency (%) _____.___

Air pollutant(s) controlled_____ Efficiency estimation method _____

D. Ambient Impact Assessment – Not Applicable

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) _____._____ Inside stack diameter (ft) _____._____

Stack temp (F) _____._____ Design stack flow rate (ACFM) _____._____

Actual stack flow rate (ACFM) _____ Velocity (ft/sec) _____._____

E. VOC-containing Substance Data

List each VOC-containing substance consumed, processed or produced at the emissions unit that is emitted into the air. In the name column, if providing a brand name, include the name of the manufacture; if the substance contains HAP, list the constituent HAP.

Substance Name (Chemical, Brand Name)	CAS No.	Substance Type	Actual Usage (gal/yr)	Max Usage (gal/day)	Max Usage (gal/year)	VOC Content (lb/gal)
Natural Gas Condensate	N/A	Natural Gas Condensate	N/A	2,548	929,922	5.7

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)

EMISSIONS UNIT DESCRIPTION FOR VOC EMITTING SOURCES (EUD-2)

A. General Information

Emissions unit ID _F1_ Description _Piping Component Fugitive Emissions_

SIC Code (4-digit) _1389_ SCC Code _31088811_

B. Emissions Unit Description

Equipment type _Valves, Flanges, Seals, etc._ Temporary source: ___ Yes _X_ No

Manufacturer _Unknown_ Model No. _Unknown_

Serial No. _Unknown_ Installation date _Unknown_

Articles being coated or degreased _N/A_

Application method _N/A_

Overspray (surface coating) (%) _N/A_ Drying method _N/A_

No. of dryers _N/A_ Tank capacity (degreasers) (gal) _N/A_

C. Associated Air Pollution Control Equipment – Not Applicable

Emissions unit ID _____ Device Type_____

Manufacturer _____ Model No_____

Serial No. _____ Installation date ____/____/_____

Control efficiency (%) _____.___ Capture efficiency (%) _____.___

Air pollutant(s) controlled_____ Efficiency estimation method _____

D. Ambient Impact Assessment – Not Applicable

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) _____._____ Inside stack diameter (ft) _____._____

Stack temp (F) _____._____ Design stack flow rate (ACFM) _____._____

Actual stack flow rate (ACFM) _____ Velocity (ft/sec) _____._____

E. VOC-containing Substance Data

List each VOC-containing substance consumed, processed or produced at the emissions unit that is emitted into the air. In the name column, if providing a brand name, include the name of the manufacture; if the substance contains HAP, list the constituent HAP.

Substance Name (Chemical, Brand Name)	CAS No.	Substance Type	Actual Usage (gal/yr)	Max Usage (gal/day)	Max Usage (gal/year)	VOC Content (lb/gal)
Natural Gas	N/A	Natural Gas	N/A	N/A	N/A	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)

EMISSIONS UNIT DESCRIPTION FOR VOC EMITTING SOURCES (EUD-2)

A. General Information

Emissions unit ID _SSM_ Description _Startup, Shutdown & Maintenance_

SIC Code (4-digit) _1389_ SCC Code _31000299_

B. Emissions Unit Description

Equipment type _SSM Emissions._ Temporary source: ___ Yes _X_ No

Manufacturer _N/A_ Model No. _N/A_

Serial No. _N/A_ Installation date _N/A_

Articles being coated or degreased _N/A_

Application method _N/A_

Overspray (surface coating) (%) _N/A_ Drying method _N/A_

No. of dryers _N/A_ Tank capacity (degreasers) (gal) _N/A_

C. Associated Air Pollution Control Equipment – Not Applicable

Emissions unit ID _____ Device Type_____

Manufacturer _____ Model No_____

Serial No. _____ Installation date ____/____/_____

Control efficiency (%) _____.___ Capture efficiency (%) _____.___

Air pollutant(s) controlled_____ Efficiency estimation method _____

D. Ambient Impact Assessment – Not Applicable

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) _____._____ Inside stack diameter (ft) _____._____

Stack temp (F) _____._____ Design stack flow rate (ACFM) _____._____

Actual stack flow rate (ACFM) _____ Velocity (ft/sec) _____._____

E. VOC-containing Substance Data

List each VOC-containing substance consumed, processed or produced at the emissions unit that is emitted into the air. In the name column, if providing a brand name, include the name of the manufacture; if the substance contains HAP, list the constituent HAP.

Substance Name (Chemical, Brand Name)	CAS No.	Substance Type	Actual Usage (gal/yr)	Max Usage (gal/day)	Max Usage (gal/year)	VOC Content (lb/gal)
Natural Gas	N/A	Natural Gas	N/A	N/A	N/A	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)
INSIGNIFICANT EMISSIONS (IE)

On this page list each insignificant activity or emission unit. In the "number" column, indicate the number of units in this category. Descriptions should be brief but unique. Indicate which emissions criterion of part 71 is the basis for the exemption.

Number	Description of Activities or Emissions Units	RAP (except HAP)	HAP
4	Fuel Gas Heater (0.3 MMBtu/hr)	X	X
5	Tank Heater (0.3 MMBtu/hr)	X	X
L1	Truck Loading (Condensate)	X	X
L2	Truck Loading (Produced Water)	X	X
T3	Produced Water Storage Tank (70 bbl)	X	X
T4	Lube Oil Storage Tank (500 gal)	X	X
T5	Lube Oil Storage Tank (500 bbl)	X	X
T6	Ambitrol Storage Tank (350 gal)	X	X
T7	Methanol Storage Tank (500 gal)	X	X

Federal Operating Permit Program (40 CFR Part 71)
EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID _1_

B. Identification and Quantification of Emissions

For each emissions unit identified above, list each regulated air pollutant or other pollutant for which the source is major, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. See instructions concerning GHGs. Values should be reported to the nearest tenth (0.1) of a ton for yearly values or tenth (0.1) of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
NO2	19.3	4.4	19.3	
CO	11.4	2.6	11.4	
VOC	0.4	0.1	0.4	
SO2	0.2	--	0.2	
TSP	0.3	0.1	0.3	
PM10	0.3	0.1	0.3	
PM2.5	0.3	0.1	0.3	
Acetaldehyde	--	--	0.2	75070
Formaldehyde	--	--	0.2	50000
Total HAPs	--	0.1	0.5	
CO2	--	--	5544.6	
CH4	--	--	0.1	

Federal Operating Permit Program (40 CFR Part 71)
EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID 2

B. Identification and Quantification of Emissions

For each emissions unit identified above, list each regulated air pollutant or other pollutant for which the source is major, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. See instructions concerning GHGs. Values should be reported to the nearest tenth (0.1) of a ton for yearly values or tenth (0.1) of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
NO2	19.2	4.4	19.2	
CO	33.9	7.7	33.9	
VOC	12.8	2.9	12.8	
SO2	--	--	--	
TSP	0.4	0.1	0.4	
PM10	0.4	0.1	0.4	
PM2.5	0.4	0.1	0.4	
Formaldehyde	--	0.5	2.2	50000
Total HAPs	--	0.5	2.3	
CO2	--	--	6,010.5	
CH4	--	--	0.1	

Federal Operating Permit Program (40 CFR Part 71)
EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID 3

B. Identification and Quantification of Emissions

For each emissions unit identified above, list each regulated air pollutant or other pollutant for which the source is major, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. See instructions concerning GHGs. Values should be reported to the nearest tenth (0.1) of a ton for yearly values or tenth (0.1) of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
NO2	0.2	3.0	0.8	
CO	--	0.7	0.2	
VOC	--	0.3	0.1	
SO2	--	0.2	0.1	
TSP	--	0.2	0.1	
PM10	--	0.2	0.1	
PM2.5	--	0.2	0.1	
Total HAPs	--	--	--	
CO2	--	--	31.2	
CH4	--	--	--	

Federal Operating Permit Program (40 CFR Part 71)
EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID T1

B. Identification and Quantification of Emissions

For each emissions unit identified above, list each regulated air pollutant or other pollutant for which the source is major, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. See instructions concerning GHGs. Values should be reported to the nearest tenth (0.1) of a ton for yearly values or tenth (0.1) of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	8.7	--	52.8	
Benzene	--	--	0.4	71432
n-Hexane	--	--	3.1	110543
Xylenes	--	--	0.1	1330207
Total HAPs	--	--	3.7	
CO2	--	--	0.1	
CH4	--	--	13.6	

Federal Operating Permit Program (40 CFR Part 71)
EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID T2

B. Identification and Quantification of Emissions

For each emissions unit identified above, list each regulated air pollutant or other pollutant for which the source is major, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. See instructions concerning GHGs. Values should be reported to the nearest tenth (0.1) of a ton for yearly values or tenth (0.1) of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	1.5	--	2.8	
Benzene	--	--	0.1	71432
n-Hexane	--	--	0.2	110543
Total HAPs	--	--	0.2	

Federal Operating Permit Program (40 CFR Part 71)
EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID F1

B. Identification and Quantification of Emissions

For each emissions unit identified above, list each regulated air pollutant or other pollutant for which the source is major, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. See instructions concerning GHGs. Values should be reported to the nearest tenth (0.1) of a ton for yearly values or tenth (0.1) of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	4.8	1.1	4.8	
Total HAPs	--	--	0.1	
CO2	--	--	0.2	
CH4	--	--	7.2	

Federal Operating Permit Program (40 CFR Part 71)
EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID SSM

B. Identification and Quantification of Emissions

For each emissions unit identified above, list each regulated air pollutant or other pollutant for which the source is major, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. See instructions concerning GHGs. Values should be reported to the nearest tenth (0.1) of a ton for yearly values or tenth (0.1) of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	4.2	--	16.1	
n-Hexane	--	--	0.4	110543
Total HAPs	--	--	0.5	
CO2	--	--	1.2	
CH4	--	--	41.0	

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)
POTENTIAL TO EMIT (PTE)

For each emissions unit at the facility, list the unit ID and the PTE of each air pollutant listed below and sum the values to determine the total PTE for the facility. It may be helpful to complete form **EMISS** before completing this form. Report each pollutant at each unit to the nearest tenth (0.1) of a ton; values may be reported with greater precision (i.e., more decimal places) if desired. Report facility total PTE for each listed pollutant on this form and in section **J** of form **GIS**. The HAP column is for the PTE of all HAPs for each unit. You may use an attachment to show any pollutants that may be present in major amounts that are not already listed on the form (this is not common).

Emissions Unit ID	Regulated Air Pollutants and Pollutants for which Source is Major (PTE in tons/yr)						
	NOx	VOC	SO2	PM10	CO	Lead	HAP
1	19.3	0.4	0.2	0.3	11.4	0.0	0.5
2	19.2	12.8	0.0	0.4	33.9	0.0	2.3
3	0.8	0.1	0.0	0.1	0.2	0.0	0.0
T1		52.8					3.7
T2		2.8					0.2
F1		4.8					0.1
SSM		16.1					0.5
FACILITY TOTALS:	**39.6**	**91.12**	**0.2**	**0.8**	**45.7**	**0.0**	**7.3**

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 11/30/2022

Federal Operating Permit Program (40 CFR Part 71)
CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

A. Responsible Official

Name: (Last) Jones (First) Travis (MI) ____

Title EH&S Manager

Street or P.O. Box 1111 Travis Street

City Houston State TX ZIP 77002 - ____

Telephone (713) 289 - 2630 Ext. ____ Facsimile (____) ____ - ____

B. Certification of Truth, Accuracy and Completeness (to be signed by the responsible official)

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) Travis Jones

Name (typed) Travis Jones Date: 2 / 1 / 2022

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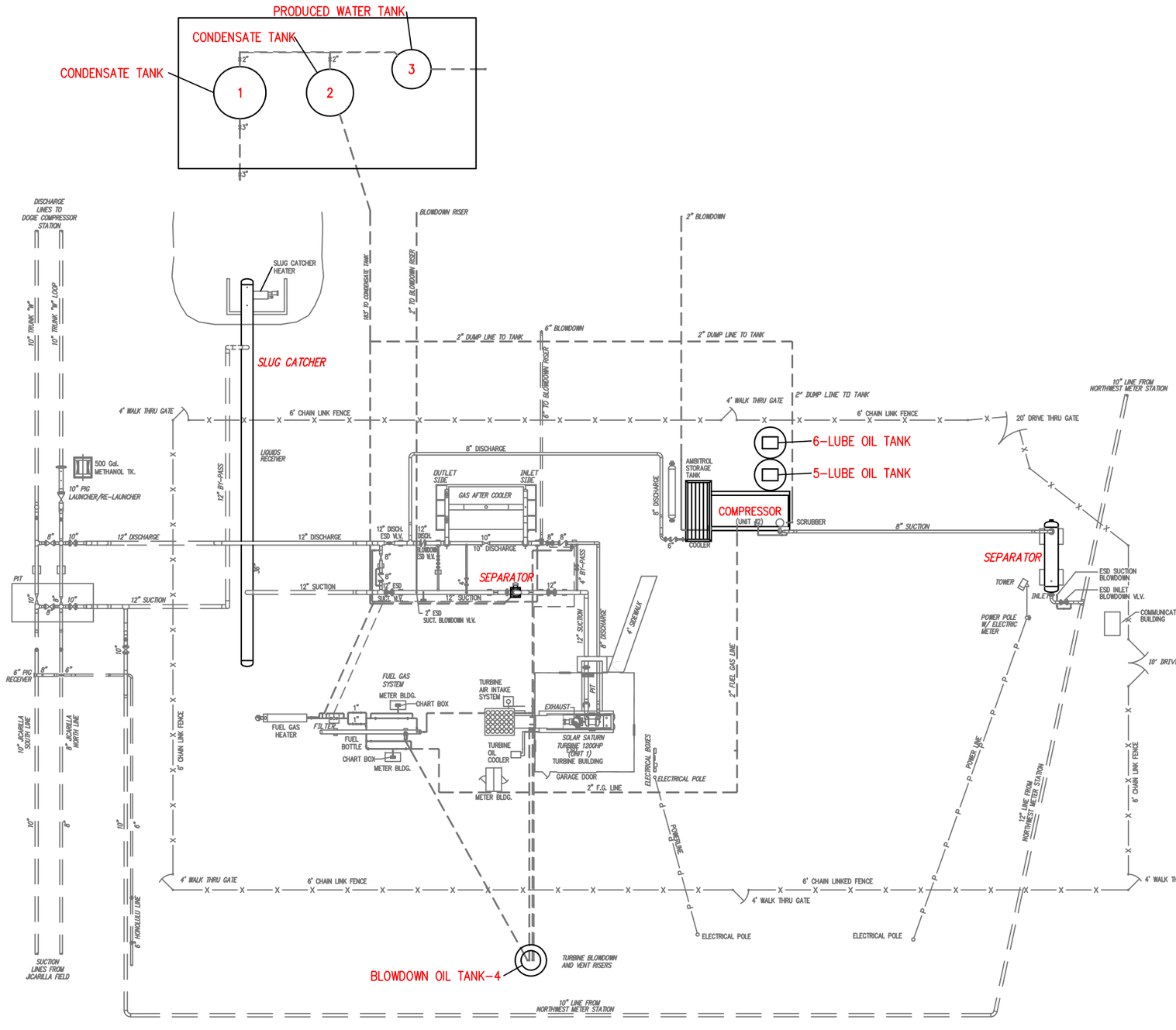
Section 2

Facility Plot Plan and Topographic Map

FIGURE 2

FACILITY LAYOUT
WILLIAMS FOUR CORNERS LLC
LOS MESTINIOS FACILITY
SW¼ SW¼, SECTION 25, T26N, R5W
RIO ARRIBA COUNTY, NEW MEXICO
N36.45096, W107.31759



Animas Environmental Services, LLC

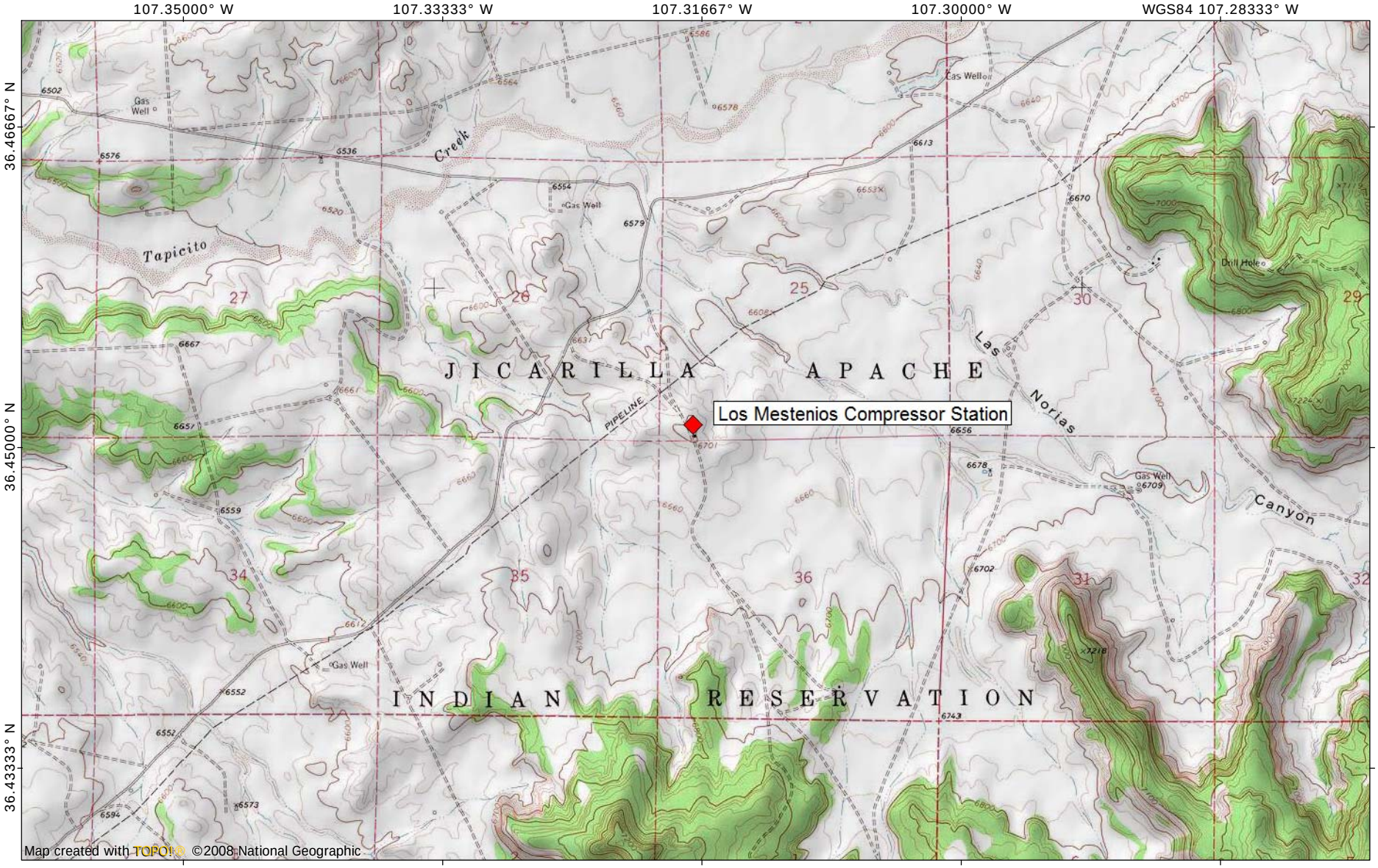
DRAWN BY:	DATE DRAWN:
C. Lameman	December 11, 2013
REVISIONS BY:	**DATE REVISED:**
C. Lameman	December 11, 2013
CHECKED BY:	**DATE CHECKED:**
K. Christiansen	December 11, 2013
APPROVED BY:	**DATE APPROVED:**
E. McNally	December 11, 2013

NOTE: SITE DIAGRAM OBTAINED FROM WILLIAMS.

N

SCALE
30 20 0 30
10
(1 INCH = 30 FEET)

HARVEST FOUR CORNERS, LLC - LOS MESTENIOS COMPRESSOR STATION - Jicarilla Apache Reservation, Rio Arriba Co., NM T 26 N, R 05 W, Sec. 25/36



0.0 0.5 1.0 miles
0.0 0.5 1.0 1.5 km

TN MN
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02/02/22

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Section 3

Emission Calculations and Documentation

Turbine – Unit 1 (Solar Saturn T1200)

The nitrogen oxide (NOx), carbon monoxide (CO), and volatile organic compound (VOC) emissions from the Solar Saturn T1200 turbine (Unit 1) were taken from previous applications and permits. Sulfur dioxide (SO2) and particulate emissions were calculated using the AP-42 emission factors from Table 3.1-2a. Hazardous air pollutant (HAP) emissions were calculated using GRI-HAPCalc 3.0. Potential to Emit (PTE) and 2021 actual emissions were calculated assuming the turbine operates at full site capacity for 8,760 hours per year (hr/yr). There were no shutdowns during 2021.

Engine – Unit 2 (Waukesha L7042GL)

The NOx, CO, and VOC emissions from the Waukesha L7042GL engine were calculated using manufacturers data. SO2 and particulate emissions were calculated using the AP-42 emission factors from Table 3.2-2. Hazardous air pollutant (HAP) emissions were calculated using GRI-HAPCalc 3.0. PTE and 2021 actual emissions were calculated assuming the engine operates at full site capacity for 8,760 hr/yr.

Engine – Unit 3 (Waukesha – Scania DS11)

Emissions from the Waukesha Scania DS11 emergency generator engine were calculated using AP-42 emission factors from Tables 3.3-1 & 3.3-2. PTE emissions were calculated assuming the engine operates at full site capacity for 500 hr/yr. Actual 2021 emissions were calculated assuming the engine operates at full site capacity for 121.8 hr/yr.

Heaters – Units 4 & 5 (Fuel Gas & Tank Heaters)

Emissions from the heaters were calculated using AP-42 emission factors from Tables 1.4-1 & 1.4-2. PTE and 2021 actual emissions were calculated assuming the heaters operate at full capacity for 8,760 hours per year. The heaters are insignificant sources.

Equipment Leak Emissions – Unit F1

VOC and HAP emissions from equipment leaks were calculated using emission factors from Table 2.4 of the 1995 Protocol for Equipment Leak Emission Estimates published by the Environmental Protection Agency (EPA) and the gas stream composition obtained from a recent extended gas analysis. PTE and 2021 actual emissions were calculated assuming the equipment operates 8,760 hours per year.

Compressors and Associated Piping – Unit SSM

Emissions associated with startups, shutdowns and routine maintenance (SSM) of the turbine (Unit 1), engine (Unit 2), and associated piping, are vented to the atmosphere.

The VOC, HAP, and greenhouse gas emissions from blowdown of the compressors and piping associated with the facility were calculated from the quantity of gas vented during each event, the composition of the

gas, and the number of events. The quantity of gas vented during each event was estimated by Harvest. The composition of the gas was based on a recent gas analysis from the facility. The estimated annual number of blowdown events includes an added safety factor because emissions from each blowdown event are dependent on the composition of the gas in the pipeline and the number of blowdowns in a year may vary. Experience indicates the composition of the gas will vary.

The SSM emissions identified in this application are routine or predictable startup/shutdown and scheduled maintenance and do not include malfunctions or upsets.

Storage Tanks

Emissions from the condensate storage tank (Unit T1) were calculated using TANKS 4.0.9d for working/breathing losses and VMGSim for flash emissions. Emissions were calculated using the condensate (post-flash) throughput of 21,141 barrels per year.

Unit T2 operates as an overflow tank for Unit T1, and has only working and breathing losses. Its emissions were conservatively based on the assumption that it will have the same condensate throughput as Unit T1.

VOC and HAP emissions from the produced water tank were calculated using maximum throughputs and emission factors from the Colorado Department of Public Health and Environment (CDPHE) and the Texas Commission on Environmental Quality (TCEQ). As VOC emissions from the produced water storage tank are less than 2.0 tpy, the produced water storage tank is a Title V insignificant source.

Residual oil #6 was used as an estimate for lubrication oil. As the vapor pressure of residual oil #6 is less than 0.2 psia, the tanks containing lubrication and used oil were assumed to be Title V insignificant sources.

As the vapor pressures of ethylene glycol and propylene glycol are less than 0.2 psia, the tank containing Ambitrol was assumed to be a Title V insignificant source. Note that Ambitrol is an inhibited ethylene or propylene glycol coolant containing ethylene or propylene glycol, water and less than 5% dipotassium hydrogen phosphate;

VOC emissions from the methanol storage tank were calculated using TANKS 4. As emissions were only 44.79 pounds per year, the tank is a Title V insignificant source.

Truck Loading – Units L1 & L2 (Condensate and Produced H2O Loading)

The VOC emissions from truck loading were calculated using the AP-42 emissions factor identified in Section 5.2-1. As emission from each operation are less than 2.0 tpy, both operations are Title V insignificant sources.

Greenhouse Gas (GHG) Emissions

For the combustion sources (Units 1-3), carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O) emissions were calculated using emission factors from the 40 Code of Federal Regulations (CFR), Part C, Tables C-1 & C-2 and the higher heating value (HHV) design heat rates.

Facility Total PTE
Emissions (Criteria Pollutants)

Company: Harvest Four Corners, LLC
Facility: Los Mestenios Compressor Station
Date: February 2022

Unit	Description	NOX,		CO,		VOC,		SOX,		TSP,		PM10,		PM2.5,	
Number		pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy
1	Solar Saturn T1200	4.41	19.30	2.60	11.40	9.13E-02	4.00E-01	3.69E-02	1.61E-01	7.15E-02	3.13E-01	7.15E-02	3.13E-01	7.15E-02	3.13E-01
2	Waukesha 7042GL	4.38	19.20	7.74	33.92	2.92	12.80	5.77E-03	2.53E-02	9.81E-02	4.30E-01	9.81E-02	4.30E-01	9.81E-02	4.30E-01
3	Scania DS11	3.04	7.61E-01	6.56E-01	1.64E-01	2.48E-01	6.21E-02	2.00E-01	5.00E-02	2.14E-01	5.35E-02	2.14E-01	5.35E-02	2.14E-01	5.35E-02
4	Fuel Gas Heater	3.33E-02	1.46E-01	2.80E-02	1.23E-01	1.83E-03	8.03E-03	2.00E-04	8.76E-04	2.53E-03	1.11E-02	2.53E-03	1.11E-02	2.53E-03	1.11E-02
5	Tank Heater	3.33E-02	1.46E-01	2.80E-02	1.23E-01	1.83E-03	8.03E-03	2.00E-04	8.76E-04	2.53E-03	1.11E-02	2.53E-03	1.11E-02	2.53E-03	1.11E-02
SSM	SSM	-	-	-	-	-	16.10	-	-	-	-	-	-	-	-
F1	Leaks	-	-	-	-	1.10	4.81	-	-	-	-	-	-	-	-
L1	Truck Loading (Condensate)	-	-	-	-	-	1.18	-	-	-	-	-	-	-	-
L2	Truck Loading (Produced H2O)	-	-	-	-	-	1.38E-03	-	-	-	-	-	-	-	-
T1	Condensate Tank - 480 bbl	-	-	-	-	-	52.82	-	-	-	-	-	-	-	-
T2	Condensate Tank - 400 bbl	-	-	-	-	-	2.80	-	-	-	-	-	-	-	-
T3	Produced H2O Tank - 70 bbl	-	-	-	-	-	1.10E-01	-	-	-	-	-	-	-	-
T4	Lube Oil Tank - 500 gal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5	Used Oil Tank - 500 gal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T6	Ambitrol Tank - 350 gal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T7	Methanol Tank - 500 gal	-	-	-	-	-	2.24E-02	-	-	-	-	-	-	-	-
	Total	11.90	39.55	11.06	45.73	4.36	91.12	2.43E-01	2.38E-01	3.89E-01	8.19E-01	3.89E-01	8.19E-01	3.89E-01	8.19E-01

Facility Total PTE
Emissions (HAPs)

Company: **Harvest Four Corners, LLC**
Facility: **Los Mestenios Compressor Station**
Date/Rev: **February 2022**

Unit Number	Description	Total HAPs,		1,3-Butadiene,		Acetaldehyde,		Acrolein,		Benzene,		Biphenyl,	
		pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy
1	Solar Saturn T1200	1.04E-01	4.55E-01	1.60E-04	7.00E-04	4.34E-02	1.90E-01	6.39E-04	2.80E-03	1.35E-03	5.90E-03	8.22E-04	3.60E-03
2	Waukesha 7042GL	5.17E-01	2.26							1.52E-02	6.65E-02		
3	Scania DS11	2.52E-03	6.31E-04			5.29E-04	1.32E-04			6.44E-04	1.61E-04		
4	Fuel Gas Heater	4.29E-03	1.88E-02	9.13E-05	4.00E-04	2.28E-04	1.00E-03			2.28E-04	1.00E-03		
5	Tank Heater	4.29E-03	1.88E-02	9.13E-05	4.00E-04	2.28E-04	1.00E-03			2.28E-04	1.00E-03		
SSM	SSM		4.62E-01								3.12E-02		
F1	Leaks	3.16E-02	1.38E-01							2.13E-03	9.31E-03		
L1	Truck Loading (Condensate)		7.37E-02								5.84E-03		
L2	Truck Loading (Produced H2O)		2.35E-06								3.69E-07		
T1	Condensate Tank - 480 bbl		3.68								3.79E-01		
T2	Condensate Tank - 400 bbl		2.04E-01								1.62E-02		
T3	Produced H2O Tank - 70 bbl		1.88E-02								2.94E-03		
T4	Lube Oil Tank - 500 gal												
T5	Used Oil Tank - 500 gal												
T6	Ambitrol Tank - 350 gal												
T7	Methanol Tank - 500 gal										2.94E-03		
	Total	6.64E-01	7.33	3.42E-04	1.50E-03	4.44E-02	1.92E-01	6.39E-04	2.80E-03	1.98E-02	5.21E-01	8.22E-04	3.60E-03

Facility Total PTE
Emissions (HAPs)

Company: **Harvest Four Corners, LLC**
Facility: **Los Mestenios Compressor S**
Date/Rev: **February 2022**

Unit Number	Description	Chromium,		Ethylbenzene,		Formaldehyde,		n-Hexane,		Isooctane		Manganese,	
		pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy
1	Solar Saturn T1200	6.85E-05	3.00E-04	2.51E-04	1.10E-03	4.24E-02	1.86E-01	3.77E-03	1.65E-02	4.02E-03	1.76E-02	4.57E-05	2.00E-04
2	Waukesha 7042GL					4.92E-01	2.15						
3	Scania DS11					8.14E-04	2.04E-04						
4	Fuel Gas Heater			6.39E-04	2.80E-03	2.51E-04	1.10E-03	4.11E-04	1.80E-03	8.45E-04	3.70E-03		
5	Tank Heater			6.39E-04	2.80E-03	2.51E-04	1.10E-03	4.11E-04	1.80E-03	8.45E-04	3.70E-03		
SSM	SSM				6.89E-04				3.63E-01		9.11E-03		
F1	Leaks			4.70E-05	2.06E-04			2.48E-02	1.08E-01	7.07E-04	3.10E-03		
L1	Truck Loading (Condensate)				3.21E-04				6.37E-02		1.17E-03		
L2	Truck Loading (Produced H2O)				3.69E-08				1.16E-06				
T1	Condensate Tank - 480 bbl				1.89E-02				3.09		5.43E-02		
T2	Condensate Tank - 400 bbl				8.90E-04				1.77E-01		3.23E-03		
T3	Produced H2O Tank - 70 bbl				2.94E-04				9.24E-03				
T4	Lube Oil Tank - 500 gal												
T5	Used Oil Tank - 500 gal												
T6	Ambitrol Tank - 350 gal												
T7	Methanol Tank - 500 gal												
	Total	6.85E-05	3.00E-04	1.58E-03	2.80E-02	5.35E-01	2.34	2.94E-02	3.83	6.42E-03	9.59E-02	4.57E-05	2.00E-04

Facility Total PTE
Emissions (HAPs)

Company: **Harvest Four Corners, LLC**
Facility: **Los Mestenios Compressor S**
Date/Rev: **February 2022**

Unit Number	Description	Methanol,		Naphthalene,		Nickel,		Phenol,		Phosphorous,		Propionaldehyde,	
		pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy
1	Solar Saturn T1200			2.28E-05	1.00E-04	2.28E-05	1.00E-04	2.74E-04	1.20E-03	1.60E-04	7.00E-04	2.17E-03	9.50E-03
2	Waukesha 7042GL												
3	Scania DS11			5.85E-05	1.46E-05								
4	Fuel Gas Heater	2.97E-04	1.30E-03										
5	Tank Heater	2.97E-04	1.30E-03										
SSM	SSM												
F1	Leaks												
L1	Truck Loading (Condensate)												
L2	Truck Loading (Produced H2O)												
T1	Condensate Tank - 480 bbl												
T2	Condensate Tank - 400 bbl												
T3	Produced H2O Tank - 70 bbl												
T4	Lube Oil Tank - 500 gal												
T5	Used Oil Tank - 500 gal												
T6	Ambitrol Tank - 350 gal												
T7	Methanol Tank - 500 gal		2.24E-02										
	Total	5.94E-04	2.50E-02	8.13E-05	1.15E-04	2.28E-05	1.00E-04	2.74E-04	1.20E-03	1.60E-04	7.00E-04	2.17E-03	9.50E-03

Facility Total PTE
Emissions (HAPs)

Company: **Harvest Four Corners, LLC**
Facility: **Los Mestenios Compressor S**
Date/Rev: **February 2022**

Unit Number	Description	Propylene Oxide,		Styrene,		Toluene,		Xylenes,	
		pph	tpy	pph	tpy	pph	tpy	pph	tpy
1	Solar Saturn T1200	3.20E-04	1.40E-03			1.03E-03	4.50E-03	3.11E-03	1.36E-02
2	Waukesha 7042GL					6.14E-03	2.69E-02	4.09E-03	1.79E-02
3	Scania DS11					2.82E-04	7.06E-05	1.97E-04	4.92E-05
4	Fuel Gas Heater			6.16E-04	2.70E-03	2.97E-04	1.30E-03	3.88E-04	1.70E-03
5	Tank Heater			6.16E-04	2.70E-03	2.97E-04	1.30E-03	3.88E-04	1.70E-03
SSM	SSM						4.93E-02		8.27E-03
F1	Leaks					3.36E-03	1.47E-02	5.64E-04	2.47E-03
L1	Truck Loading (Condensate)						7.68E-04		1.86E-03
L2	Truck Loading (Produced H2O)						4.74E-07		3.16E-07
T1	Condensate Tank - 480 bbl						4.46E-02		9.45E-02
T2	Condensate Tank - 400 bbl						2.13E-03		5.15E-03
T3	Produced H2O Tank - 70 bbl						3.78E-03		2.52E-03
T4	Lube Oil Tank - 500 gal								
T5	Used Oil Tank - 500 gal								
T6	Ambitrol Tank - 350 gal								
T7	Methanol Tank - 500 gal								
	Total	3.20E-04	1.40E-03	1.23E-03	5.40E-03	1.14E-02	1.49E-01	8.73E-03	1.50E-01

Turbine Exhaust PTE Emissions Calculations

Unit Number: 1
Description: Solar Saturn T1200

Horsepower Calculations

6,715	ft above MSL	Elevation	
1,200	hp	Nameplate hp	Mfg. data
1,136	hp	Site-rated hp	Mfg. data

Fuel Consumption

10.84	MMBtu/hr	Hourly fuel consumption	Btu/hp-hr x NMAQB site-rated hp / 1,000,000
12,044	scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
8,760	hr/yr	Annual operating time	Harvest Four Corners, LLC
94,958	MMBtu/yr	Annual fuel consumption	MMBtu/hr x hr/yr
105.51	MMscf/yr	Annual fuel consumption	scf/hr x hr/yr / 1,000,000
900	Btu/scf	Field gas heating value	Nominal heat content

Steady-State Emission Rates

Pollutants	Uncontrolled Emission Rates, pph	tpy
NOX	4.41	19.30
CO	2.60	11.40
VOC	9.13E-02	4.00E-01

Emissions brought forward from Part 71 TV permit R6NM-04-10-M1

Pollutants	Emission Factors, lb/MMBtu	Uncontrolled Emission Rates, pph	tpy
SO2	3.40E-03	3.69E-02	1.61E-01
TSP	6.60E-03	7.15E-02	3.13E-01
PM10	6.60E-03	7.15E-02	3.13E-01
PM2.5	6.60E-03	7.15E-02	3.13E-01

Emission factors taken from AP-42, Table 3.1-2a
Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

GRI-HAPCalc® 3.0
Turbine Report

Facility ID:	**LOS MESTENIOS**	**Notes:**
Operation Type:	**COMPRESSOR STATION**	
Facility Name:	**LOS MESTENIOS COMPRESSOR**	
User Name:	**Harvest Four Corners, LLC**	
Units of Measure:	**U.S. STANDARD**	

Note: Emissions less than 5.00E-09 tons (or tonnes) per year are considered insignificant and are treated as zero. These emissions are indicated on the report with a "0". Emissions between 5.00E-09 and 5.00E-05 tons (or tonnes) per year are represented on the report with "0.0000".

Turbine Unit

Unit Name: T1200

Hours of Operation: 8,760 Yearly

Rate Power: 1136 hp

Fuel Type: NATURAL GAS

Emission Factor Set: FIELD > EPA > LITERATURE

Additional EF Set: -NONE-

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set
HAPs			
Formaldehyde	0.1856	0.01693680 g/bhp-hr	GRI Field
Acetaldehyde	0.1900	0.01733570 g/bhp-hr	GRI Field
1,3-Butadiene	0.0007	0.00006160 g/bhp-hr	GRI Field
Acrolein	0.0028	0.00026000 g/bhp-hr	GRI Field
Propional	0.0095	0.00086500 g/bhp-hr	GRI Field
Propylene Oxide	0.0014	0.00012480 g/bhp-hr	EPA
n-Nitrosodimethylamine	0.0000	0.00000100 g/bhp-hr	EPA
Benzene	0.0059	0.00053840 g/bhp-hr	GRI Field
Toluene	0.0045	0.00041100 g/bhp-hr	GRI Field
Ethylbenzene	0.0011	0.00010330 g/bhp-hr	EPA
Xylenes(m,p,o)	0.0136	0.00124410 g/bhp-hr	GRI Field
2,2,4-Trimethylpentane	0.0176	0.00160530 g/bhp-hr	GRI Field
n-Hexane	0.0165	0.00150580 g/bhp-hr	GRI Field
Phenol	0.0012	0.00011010 g/bhp-hr	GRI Field
n-Nitrosomorpholine	0.0000	0.00000100 g/bhp-hr	EPA
Naphthalene	0.0001	0.00000760 g/bhp-hr	GRI Field
2-Methylnaphthalene	0.0000	0.00000130 g/bhp-hr	GRI Field
Biphenyl	0.0036	0.00033050 g/bhp-hr	GRI Field
Phenanthrene	0.0000	0.00000050 g/bhp-hr	GRI Field
Chrysene	0.0000	0.00000100 g/bhp-hr	GRI Field
Beryllium	0.0000	0.00000010 g/bhp-hr	GRI Field
Phosphorous	0.0007	0.00006520 g/bhp-hr	GRI Field
Chromium	0.0001	0.00000820 g/bhp-hr	GRI Field
Chromium	0.0001	0.00000560 g/bhp-hr	EPA
Manganese	0.0002	0.00001750 g/bhp-hr	GRI Field
Nickel	0.0001	0.00000610 g/bhp-hr	GRI Field
Cobalt	0.0000	0.00000160 g/bhp-hr	GRI Field

Arsenic	0.0000	0.00000060 g/bhp-hr	GRI Field
Selenium	0.0000	0.00000030 g/bhp-hr	GRI Field
Cadmium	0.0000	0.00000020 g/bhp-hr	GRI Field
Mercury	0.0000	0.00000270 g/bhp-hr	GRI Field
Lead	0.0000	0.00000340 g/bhp-hr	GRI Field
Total	0.4553		

Criteria Pollutants

PM	0.3490	0.03184680 g/bhp-hr	EPA
CO	23.1061	2.10828420 g/bhp-hr	GRI Field
NMHC	2.1248	0.19387800 g/bhp-hr	GRI Field
NMEHC	0.1321	0.01205010 g/bhp-hr	EPA
NOx	13.7233	1.25216290 g/bhp-hr	GRI Field
SO2	0.0113	0.00102720 g/bhp-hr	GRI Field

Other Pollutants

Methane	10.8193	0.98719230 g/bhp-hr	GRI Field
Acetylene	0.0785	0.00716540 g/bhp-hr	GRI Field
Ethylene	0.1529	0.01395450 g/bhp-hr	GRI Field
Ethane	1.6449	0.15008370 g/bhp-hr	GRI Field
Propane	0.1754	0.01600000 g/bhp-hr	GRI Field
Isobutane	0.0526	0.00480000 g/bhp-hr	GRI Field
Butane	0.0570	0.00520000 g/bhp-hr	GRI Field
Trimethylamine	0.0000	0.00000070 g/bhp-hr	EPA
Cyclopentane	0.0181	0.00165110 g/bhp-hr	GRI Field
Butyrald/Isobutyraldehyde	0.0147	0.00134000 g/bhp-hr	GRI Field
n-Pentane	0.8894	0.08115000 g/bhp-hr	GRI Field
Cyclohexane	0.0671	0.00612400 g/bhp-hr	GRI Field
Methylcyclohexane	0.0968	0.00883120 g/bhp-hr	GRI Field
n-Octane	0.0349	0.00318890 g/bhp-hr	GRI Field
1,3,5-Trimethylbenzene	0.0329	0.00300000 g/bhp-hr	GRI Field
n-Nonane	0.0058	0.00053260 g/bhp-hr	GRI Field
CO2	5,188.2765	473.39811550 g/bhp-hr	EPA
Vanadium	0.0000	0.00000070 g/bhp-hr	GRI Field
Copper	0.0002	0.00002050 g/bhp-hr	GRI Field
Molybdenum	0.0002	0.00002030 g/bhp-hr	GRI Field
Barium	0.0003	0.00002290 g/bhp-hr	GRI Field

Table 3.1-2a. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM STATIONARY GAS TURBINES

Emission Factors[a] - Uncontrolled				
Pollutant	Natural Gas-Fired Turbines[b]		Distillate Oil-Fired Turbines[d]	
	(lb/MMBtu)[c] (Fuel Input)	Emission Factor Rating	(lb/MMBtu)[e] (Fuel Input)	Emission Factor Rating
CO_2[f]	110	A	157	A
N_2O	0.003[g]	E	ND	NA
Lead	ND	NA	1.4 E-05	C
SO_2	0.94S[h]	B	1.01S[h]	B
Methane	8.6 E-03	C	ND	NA
VOC	2.1 E-03	D	4.1 E-04[j]	E
TOC[k]	1.1 E-02	B	4.0 E-03[l]	C
PM (condensible)	4.7 E-03[l]	C	7.2 E-03[l]	C
PM (filterable)	1.9 E-03[l]	C	4.3 E-03[l]	C
PM (total)	6.6 E-03[l]	C	1.2 E-02[l]	C

[a] Factors are derived from units operating at high loads (≥ 80 percent load) only. For information on units operating at other loads, consult the background report for this chapter (Reference 16), available at "www.epa.gov/ttn/chief". ND = No Data, NA = Not Applicable.

[b] SCCs for natural gas-fired turbines include 2-01-002-01, 2-02-002-01 & 03, and 2-03-002-02 & 03.

[c] Emission factors based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60°F. To convert from (lb/MMBtu) to ($lb/10^6$ scf), multiply by 1020. Similarly, these emission factors can be converted to other natural gas heating values.

[d] SCCs for distillate oil-fired turbines are 2-01-001-01, 2-02-001-01, 2-02-001-03, and 2-03-001-02.

[e] Emission factors based on an average distillate oil heating value of 139 $MMBtu/10^3$ gallons. To convert from (lb/MMBtu) to ($lb/10^3$ gallons), multiply by 139.

[f] Based on 99.5% conversion of fuel carbon to CO_2 for natural gas and 99% conversion of fuel carbon to CO_2 for distillate oil. CO_2 (Natural Gas) [lb/MMBtu] = (0.0036 scf/Btu)(%CON)(C)(D), where %CON = weight percent conversion of fuel carbon to CO_2, C = carbon content of fuel by weight, and D = density of fuel. For natural gas, C is assumed at 75%, and D is assumed at 4.1 E+04 $lb/10^6$scf. For distillate oil, CO_2 (Distillate Oil) [lb/MMBtu] = (26.4 gal/MMBtu) (%CON)(C)(D), where C is assumed at 87%, and the D is assumed at 6.9 lb/gallon.

[g] Emission factor is carried over from the previous revision to AP-42 (Supplement B, October 1996) and is based on limited source tests on a single turbine with water-steam injection (Reference 5).

[h] All sulfur in the fuel is assumed to be converted to SO_2. S = percent sulfur in fuel. Example, if sulfur content in the fuel is 3.4 percent, then S = 3.4. If S is not available, use 3.4 E-03 lb/MMBtu for natural gas turbines, and 3.3 E-02 lb/MMBtu for distillate oil turbines (the equations are more accurate).

[j] VOC emissions are assumed equal to the sum of organic emissions.

[k] Pollutant referenced as THC in the gathered emission tests. It is assumed as TOC, because it is based on EPA Test Method 25A.

[l] Emission factors are based on combustion turbines using water-steam injection.

Engine Exhaust PTE Emissions Calculations

Unit Number: 2
Description: Waukesha L7042GL
Type: Four Stroke Lean Burn (Turbocharged)

Horsepower Calculations

6,715 ft above MSL	Elevation	
1,480 hp	Nameplate hp	Mfg. data
1,326 hp	Mfg. Site-rated hp	Mfg. product bulletin Power Derate, S8154-6, April 2001 (loss of 2% for every 1,000 ft over 1,500 ft)

Engine Specifications

1200 rpm	Engine rpm	Mfg. data
7040 cu in	Engine displacement	Mfg. data
124.28 psi	BMEP	792,000 x Mfg. Site-rated hp / (rpm * cu in)

Fuel Consumption

7408 Btu/hp-hr	Brake specific fuel consumption	Mfg. data
9.82 MMBtu/hr	Hourly fuel consumption	Btu/hp-hr x Mfg. site-rated hp / 1,000,000
900 Btu/scf	Field gas heating value	Nominal heat content
10,912 scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
8,760 hr/yr	Annual operating time	Harvest Four Corners, LLC
86,027 MMBtu/yr	Annual fuel consumption	MMBtu/hr x hr/yr
95.59 MMscf/yr	Annual fuel consumption	scf/hr x hr/yr / 1,000,000

Steady-State Emission Rates

Pollutants	Emission Factors, g/hp-hr	Uncontrolled Emission Rates, pph	tpy
NOX	1.50	4.38	19.20
CO	2.65	7.74	33.92
VOC	1.00	2.92	12.80

Emission factors taken from Waukesha Bulletin 7005 0107
Uncontrolled Emission Rates (pph) = g/hp-hr x hp / 453.59 g/lb
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Pollutants	Emission Factors, lb/MMBtu	Uncontrolled Emission Rates, pph	tpy
SO2	5.88E-04	5.77E-03	2.53E-02
TSP	9.99E-03	9.81E-02	4.30E-01
PM10	9.99E-03	9.81E-02	4.30E-01
PM2.5	9.99E-03	9.81E-02	4.30E-01

Emission factors taken from AP-42, Table 3.2-2
Particulate factors include both filterable and condensible emissions
Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

GRI-HAPCalc® 3.0
Engines Report

Facility ID:	**LOS MESTENIOS**	**Notes:**
Operation Type:	**COMPRESSOR STATION**	
Facility Name:	**LOS MESTENIOS COMPRESSOR**	
User Name:	**Harvest Four Corners, LLC**	
Units of Measure:	**U.S. STANDARD**	

Note: Emissions less than 5.00E-09 tons (or tonnes) per year are considered insignificant and are treated as zero. These emissions are indicated on the report with a "0". Emissions between 5.00E-09 and 5.00E-05 tons (or tonnes) per year are represented on the report with "0.0000".

Engine Unit

Unit Name: 7042GL

Hours of Operation:	8,760	Yearly
Rate Power:	1,326	hp
Fuel Type:	FIELD GAS	
Engine Type:	4-Stroke, Lean Burn	
Emission Factor Set:	FIELD > EPA > LITERATURE	
Additional EF Set:	-NONE-	

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set
HAPs			
Formaldehyde	2.1530	0.16830000 g/bhp-hr	GRI Literature
Benzene	0.0665	0.00520000 g/bhp-hr	GRI Literature
Toluene	0.0269	0.00210000 g/bhp-hr	GRI Literature
Xylenes(m,p,o)	0.0179	0.00140000 g/bhp-hr	GRI Literature
Total	2.2643		

STANDARD EQUIPMENT

AIR CLEANER – Two, 3" dry type filter with hinged rain shield and service indicator.

BARRING DEVICE – Manual.

BATTERY BOX – Ship loose battery box designed to accommodate two series 31 12 VDC batteries. Includes power disconnect switch and 20 foot (6.1 m) cable for connection to ESM Power Distribution Box.

BEARINGS – Heavy duty, replaceable, precision type.

BREATHER – Self regulating, closed system.

CONNECTING RODS – Drop forged steel, rifle drilled.

CONTROL SYSTEM – Waukesha Engine System Manager (ESM) integrates spark timing control, speed governing, detonation detection, start-stop control, diagnostic tools, fault logging and engine safeties. Engine Control Unit (ECU) is central brain of the control system and main customer interface. Interface with ESM is through 25 foot (7.6 m) harness to local panel, through MODBUS RTU slave connection RS-485 multidrop hardware, and through the Electronic Service Program (ESP). Customer connections are only required to the local panel, fuel valve, and 24V DC power supply. Compatible with Woodward load sharing module. ESM meets Canadian Standards Association Class I, Division 2, Group D, hazardous location requirements. ESM controlled prechamber logic.

CRANKCASE – Integral crankcase and cylinder frame. Main bearing caps drilled and tapped for temperature sensors. Does not include sensors.

CRANKSHAFT – Counterweighted, forged steel, seven main bearings, and dynamically balanced.

CYLINDERS – Removable bainitic cast iron wet type cylinder liners, chrome plated on outer diameter.

CYLINDER HEADS – Twelve interchangeable. Two hard faced intake and two hard faced exhaust valves per cylinder. Hard faced intake and exhaust valve seat inserts. Roller valve lifters and hydraulic push rods. Includes prechamber and related fuel control valves.

ENGINE ROTATION – Counterclockwise when facing flywheel.

ENGINE MONITORING DEVICES – Factory mounted and wired sensors for lube oil pressure and temperature; intake manifold temperature and pressure; overspeed; and jacket water temperature; all accessible through ESM®. ESM continually monitors combustion performance through accelerometers to provide detonation protection. Dual magnetic pick-ups are used for accurate engine speed monitoring. ESM provides predictive spark plug diagnostics as well as advanced diagnostics of engine and all ESM sensors and logs any faults into non-volatile flash memory.

EXHAUST THERMOCOUPLES – 14 K-type thermocouples. One for each individual cylinder and one pre-turbine for each bank and 25 foot (7.6 m) harness.

EXHAUST OUTLET – Single vertical at rear. Flexible stainless steel connection with 8" (203 mm) pipe flange.

FLYWHEEL – Approx. WR2 = 155000 lb-in2; with ring gear (208 teeth), machined to accept two drive adapters: 31.88" (810 mm) pilot bore, 30.25"(768 mm) bolt circle, (12) 0.75"–10 tapped holes; or 28.88" (734 mm) pilot bore, 27.25" (692 mm) bolt circle, (12) 0.625"–11 tapped holes and (12) 0.75"–10 tapped holes.

FLYWHEEL HOUSING – No. 00 SAE.

FUEL SYSTEM – Single 3" ANSI flange fuel inlet connection. Dual natural gas, 4" (102 mm) duplex updraft carburetors. Two mounted Mooney Flowgrid 250, 2" (51 mm) gas regulators, 43 – 60 psi (296 – 414 kPa) gas inlet pressure required. Prechamber fuel system and control logic. 10 foot (3 m) harness provided for ESM control of customer supplied fuel shutoff valve.

GOVERNOR – Electric throttle actuator controlled by ESM with throttle position feedback. Governor tuning is performed using ESP. ESM includes option of a load-coming feature to improve engine response to step loads.

IGNITION SYSTEM – Ignition Power Module (IPM) controlled by ESM, with spark timing optimized for any speed-load condition. Dual voltage energy levels automatically controlled by ESM to maximize spark plug life.

INTERCOOLER – Air–to–water.

LEVELING BOLTS

LIFTING EYES – Requires 9.5 ton Working Load Limit (W.L.L.) anchor shackles.

LUBRICATION – Full pressure, gear type pump. Engine mounted full flow lube oil micro-fiberglass filters with mounted differential pressure gauge. MICROSPIN® bypass filter, engine mounted. Lube oil strainer, mounted. Air/gas motor driven prelube pump, requires final piping.

MANIFOLDS – Exhaust, (2) water cooled.

OIL COOLER – Shell and tube type, with thermostatic temperature controller and pressure regulating valve. Factory mounted.

OIL PAN – Deep sump type. 190 gallon (719 L) capacity including filter and cooler.

PAINT – Oilfield orange primer.

PISTONS – Aluminum with floating pin. Oil cooled.

SHIPPING SKID – For domestic truck or rail.

TURBOCHARGERS – Two, dry type. Wastegate controlled.

VIBRATION DAMPER – Two, viscous type. Guard included with remote mounted radiator or no radiator.

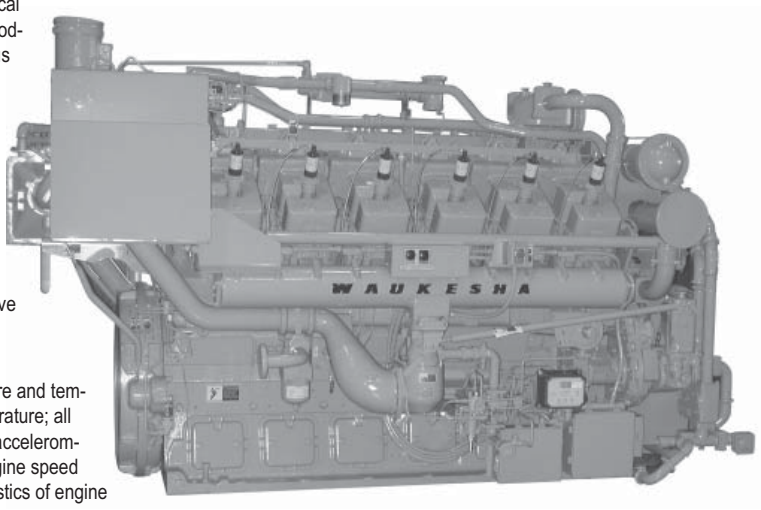
WATER CIRCULATING SYSTEM, AUXILIARY CIRCUIT – Belt driven water circulating high capacity pump for intercooler and lube oil cooler. See S6543-38 performance curve for use with standard 10" diameter crankshaft pulley. Includes thermostatic valve.

WATER CIRCULATING SYSTEM, ENGINE JACKET – Belt driven water circulating pump, cluster type thermostatic temperature regulating valve, full flow bypass type. Flange connections and mating flanges for (2) 4" (102 mm) inlets and (1) 5" (127 mm) outlet.

Waukesha
POWERING PERFORMANCE

L7042GL

VHP® Gas Engine
886 - 1547 BHP



Engine shown without Extender Series Features.

Model L7042GL with ESM®
Turbocharged and Intercooled, Twelve Cylinder, Lean Combustion, Four-Cycle Gas Engine

SPECIFICATIONS

Cylinders
V 12

Piston Displacement
7040 cu. in.
(115 L)

Bore & Stroke
9.375″ x 8.5″
(238 x 216 mm)

Compression Ratio
10.5:1

Jacket Water System Capacity
107 gal.
(405 L)

Lube Oil Capacity
190 gal.
(719 L)

Starting System
125 - 150 psi air/gas
24/32V electric

Dry Weight
21,000 lb.
(9525 kg)

POWER RATINGS: L7042GL VHP® GAS ENGINES

Model	I.C. Water Inlet Temp. °F (°C) (Tcra)	C.R.	Brake Horsepower (kWb Output) 800 rpm	900 rpm	1000 rpm	1100 rpm	1200 rpm
L7042GL	85° (29°)	10.5:1	928 (692)	1160 (865)	1289 (961)	1418 (1057)	1547 (1154)
L7042GL	130° (54°)	10.5:1	886 (661)	1110 (828)	1233 (919)	1357 (1012)	1480 (1104)

Rating Standard: All models: Ratings are based on ISO 3046/1-1995 with mechanical efficiency of 90% and auxiliary water temperature Tcra (clause 10.1) as specified above limited to ± 10° F (± 5° C). Ratings are also valid for SAE J1349, BS5514, DIN6271 and AP17B-11C standard atmospheric conditions.

ISO Standard Power/Continuous Power Rating: The highest load and speed which can be applied 24 hours a day, seven days a week, 365 days per year except for normal maintenance. It is permissible to operate the engine at up to 10% overload, or maximum load indicated by the intermittent rating, whichever is lower, for two hours in each 24 hour period.

All natural gas engine ratings are based on a fuel of 900 Btu/ft^3 (35.3 MJ/nm^3) SLHV value, with a 91 Waukesha Knock Index®.

For conditions or fuels other than standard, contact the Waukesha Engine Sales Engineering Department.

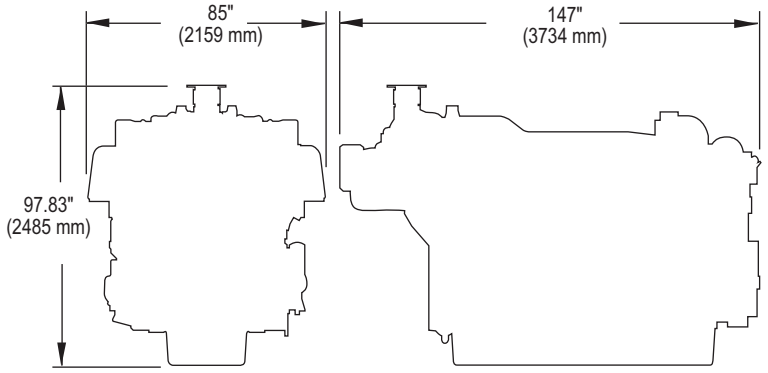
PERFORMANCE: L7042GL VHP® GAS ENGINES

NO_x Settings	English	130° F ICW		85° F ICW	
	RPM	**1200**	**1000**	**1200**	**1000**
1.5 g NO_x	Power (Bhp)	1480	1233	1547	1289
	BSFC (Btu/bhp-hr)	7135	6850	7160	6865
	NOx (grams/bhp-hr)	1.50	1.50	1.50	1.50
	CO (grams/bhp-hr)	2.65	2.65	2.65	2.65
	NMHC (grams/bhp--hr)	0.70	0.80	0.80	0.90

NO_x Settings	Metric	54° C ICW		29° C ICW	
	RPM	**1200**	**1000**	**1200**	**1000**
1.5 g NO_x	Power (kWb)	1104	919	1154	962
	BSFC (kJ/kW-hr)	10089	9686	10124	9707
	NOx (g/nm^3)	0.62	0.62	0.62	0.62
	CO (g/nm^3)	1.09	1.09	1.09	1.09
	NMHC (g/nm^3)	0.29	0.41	0.33	0.37

NOTES:

1) Fuel consumption and exhaust emissions are based on ISO 3046/1-1995 standard reference conditions and commercial quality natural gas of 900 Btu/ft^3 (35.38 MJ/m^3 [25, V(0; 101.325)]) saturated lower heat value, Waukesha Knock Index® of 91 and 93% methane content by volume. ISO 3046/1-1995 standard reference conditions are 77°F (25°C) ambient temperature, 29.54 inches Hg (100 kPa) barometric pressure, 30% relative humidity (1kPa/0.3 inches Hg water vapor pressure).
2) S.I. exhaust emissions are corrected to 5% O_2 (0°C and 101.325 kPa).
3) Data will vary due to variations in site conditions. For conditions and/or fuels other than standard, consult the Waukesha Engine Sales Engineering Department.
4) Fuel consumption based on ISO 3046/1-1995 with a +5% tolerance for commercial quality natural gas having a 900 Btu/ft^3 saturated low heat valve



DRESSER
Waukesha

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waukeshaengine.dresser.com

Bulletin 7005 0107

Consult your local Waukesha Distributor for system application assistance. The manufacturer reserves the right to change or modify without notice, the design or equipment specifications as herein set forth without incurring any obligation either with respect to equipment previously sold or in the process of construction except where otherwise specifically guaranteed by the manufacturer.

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

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	4.08 E+00	B
NO_x[c] <90% Load	8.47 E-01	B
CO[c] 90 - 105% Load	3.17 E-01	C
CO[c] <90% Load	5.57 E-01	B
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	1.47 E+00	A
Methane[g]	1.25 E+00	C
VOC[h]	1.18 E-01	C
PM10 (filterable)[i]	7.71 E-05	D
PM2.5 (filterable)[i]	7.71 E-05	D
PM Condensable[j]	9.91 E-03	D
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[k]	<4.00 E-05	E
1,1,2-Trichloroethane[k]	<3.18 E-05	E
1,1-Dichloroethane	<2.36 E-05	E
1,2,3-Trimethylbenzene	2.30 E-05	D
1,2,4-Trimethylbenzene	1.43 E-05	C
1,2-Dichloroethane	<2.36 E-05	E
1,2-Dichloropropane	<2.69 E-05	E
1,3,5-Trimethylbenzene	3.38 E-05	D
1,3-Butadiene[k]	2.67E-04	D
1,3-Dichloropropene[k]	<2.64 E-05	E
2-Methylnaphthalene[k]	3.32 E-05	C
2,2,4-Trimethylpentane[k]	2.50 E-04	C
Acenaphthene[k]	1.25 E-06	C

Engine Exhaust Emissions Calculations

Unit Number: 3
Description: Scania DS11 Diesel Generator (Emergency)

Horsepower

250	hp	Nameplate hp	Mfg. data

The data sheet shows the DS11 has a horsepower rating of 250+. Since the assocaited alternator is rated at 130 kW, the assumption of a site rating at 250 hp should be conservative.

Fuel Consumption

0.69	MMBtu/hr	Hourly fuel consumption	Mfg. data
138,000	Btu/gal	Field gas heating value	Nominal heat content
5.00	gal/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/gal
500	hr/yr	Annual operating time	Harvest Four Corners, LLC
2,500	gal/yr	Hourly fuel consumption	gal/hr x hr/yr
345	MMBtu/yr	Annual fuel consumption	MMBtu/hr x hr/yr

Steady-State Emission Rates

Pollutants	Emission Factors, lb/MMBtu	Uncontrolled Emission Rates, pph	tpy
NO2	4.41	3.04	7.61E-01
CO	9.50E-01	6.56E-01	1.64E-01
VOC	3.60E-01	2.48E-01	6.21E-02
SO2	2.90E-01	2.00E-01	5.00E-02
TSP	3.10E-01	2.14E-01	5.35E-02
PM10	3.10E-01	2.14E-01	5.35E-02
PM2.5	3.10E-01	2.14E-01	5.35E-02
Acetaldehyde	7.67E-04	5.29E-04	1.32E-04
Benzene	9.33E-04	6.44E-04	1.61E-04
Formaldehyde	1.18E-03	8.14E-04	2.04E-04
Naphthalene	8.48E-05	5.85E-05	1.46E-05
Toluene	4.09E-04	2.82E-04	7.06E-05
Xylene	2.85E-04	1.97E-04	4.92E-05

Emission factors taken from AP-42, Tables 3.3-1 & 3.3-2
Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINES[a]

Pollutant	Gasoline Fuel (SCC 2-02-003-01, 2-03-003-01)		Diesel Fuel (SCC 2-02-001-02, 2-03-001-01)		EMISSION FACTOR RATING
	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	
NO_x	0.011	1.63	0.031	4.41	D
CO	6.96 E-03[d]	0.99[d]	6.68 E-03	0.95	D
SO_x	5.91 E-04	0.084	2.05 E-03	0.29	D
PM-10[b]	7.21 E-04	0.10	2.20 E-03	0.31	D
CO_2[c]	1.08	154	1.15	164	B
Aldehydes	4.85 E-04	0.07	4.63 E-04	0.07	D
TOC					
Exhaust	0.015	2.10	2.47 E-03	0.35	D
Evaporative	6.61 E-04	0.09	0.00	0.00	E
Crankcase	4.85 E-03	0.69	4.41 E-05	0.01	E
Refueling	1.08 E-03	0.15	0.00	0.00	E

[a] References 2,5-6,9-14. When necessary, an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/MMBtu to lb/hp-hr. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code. TOC = total organic compounds.

[b] PM-10 = particulate matter less than or equal to 10 μm aerodynamic diameter. All particulate is assumed to be ≤ 1 μm in size.

[c] Assumes 99% conversion of carbon in fuel to CO_2 with 87 weight % carbon in diesel, 86 weight % carbon in gasoline, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and gasoline heating value of 20,300 Btu/lb.

[d] Instead of 0.439 lb/hp-hr (power output) and 62.7 lb/mmBtu (fuel input), the correct emissions factors values are 6.96 E-03 lb/hp-hr (power output) and 0.99 lb/mmBtu (fuel input), respectively. This is an editorial correction. March 24, 2009

Table 3.3-2. SPECIATED ORGANIC COMPOUND EMISSION FACTORS FOR UNCONTROLLED DIESEL ENGINES[a]

EMISSION FACTOR RATING: E

Pollutant	Emission Factor (Fuel Input) (lb/MMBtu)
Benzene[b]	9.33 E-04
Toluene[b]	4.09 E-04
Xylenes[b]	2.85 E-04
Propylene	2.58 E-03
1,3-Butadiene[b,c]	<3.91 E-05
Formaldehyde[b]	1.18 E-03
Acetaldehyde[b]	7.67 E-04
Acrolein[b]	<9.25 E-05
Polycyclic aromatic hydrocarbons (PAH)	
Naphthalene[b]	8.48 E-05
Acenaphthylene	<5.06 E-06
Acenaphthene	<1.42 E-06
Fluorene	2.92 E-05
Phenanthrene	2.94 E-05
Anthracene	1.87 E-06
Fluoranthene	7.61 E-06
Pyrene	4.78 E-06
Benzo(a)anthracene	1.68 E-06
Chrysene	3.53 E-07
Benzo(b)fluoranthene	<9.91 E-08
Benzo(k)fluoranthene	<1.55 E-07
Benzo(a)pyrene	<1.88 E-07
Indeno(1,2,3-cd)pyrene	<3.75 E-07
Dibenz(a,h)anthracene	<5.83 E-07
Benzo(g,h,l)perylene	<4.89 E-07
TOTAL PAH	1.68 E-04

[a] Based on the uncontrolled levels of 2 diesel engines from References 6-7. Source Classification Codes 2-02-001-02, 2-03-001-01. To convert from lb/MMBtu to ng/J, multiply by 430.
[b] Hazardous air pollutant listed in the *Clean Air Act*.
[c] Based on data from 1 engine.

Heater Exhaust PTE Emissions Calculations

Unit Number: 4 & 5
Description: Fuel Gas Heater and Tank Heater

Note: The data on this worksheet applies to each individual emissions unit identified above.

Fuel Consumption

0.30	MMBtu/hr	Capacity	Mfg. data
333	scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
8,760	hr/yr	Annual operating time	Harvest Four Corners, LLC
2,628	MMBtu/yr	Annual fuel consumption	MMBtu/hr x hr/yr
2.92	MMscf/yr	Annual fuel consumption	scf/hr x hr/yr / 1,000,000
900	Btu/scf	Field gas heating value	Nominal heat content

Steady-State Emission Rates

Pollutants	Emission Factors, lb/MMscf	Uncontrolled Emission Rates, pph	tpy
NOX	100	3.33E-02	1.46E-01
CO	84	2.80E-02	1.23E-01
VOC	5.5	1.83E-03	8.03E-03
SO2	0.6	2.00E-04	8.76E-04
TSP	7.60	2.53E-03	1.11E-02
PM10	7.60	2.53E-03	1.11E-02
PM2.5	7.60	2.53E-03	1.11E-02
Lead	5.00E-04	1.67E-07	7.30E-07

Emission factors taken from AP-42, Tables 1.4-1 & 1.4-2
Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

GRI-HAPCalc® 3.0
External Combustion Devices Report

Facility ID:	**LOS MESTENIOS**	**Notes:**
Operation Type:	**COMPRESSOR STATION**	
Facility Name:	**LOS MESTENIOS COMPRESSOR**	
User Name:	**Harvest Four Corners, LLC**	
Units of Measure:	**U.S. STANDARD**	

Note: Emissions less than 5.00E-09 tons (or tonnes) per year are considered insignificant and are treated as zero. These emissions are indicated on the report with a "0". Emissions between 5.00E-09 and 5.00E-05 tons (or tonnes) per year are represented on the report with "0.0000".

External Combustion Devices

Unit Name: HEATERS

Hours of Operation:	8,760	Yearly
Heat Input:	0.30	MMBtu/hr
Fuel Type:	NATURAL GAS	
Device Type:	HEATER	
Emission Factor Set:	FIELD > EPA > LITERATURE	
Additional EF Set:	-NONE-	

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set
HAPs			
7,12-Dimethylbenz(a)anthracene	0.0000	0.0000000157 lb/MMBtu	EPA
Formaldehyde	0.0011	0.0008440090 lb/MMBtu	GRI Field
Methanol	0.0013	0.0009636360 lb/MMBtu	GRI Field
Acetaldehyde	0.0010	0.0007375920 lb/MMBtu	GRI Field
1,3-Butadiene	0.0004	0.0003423350 lb/MMBtu	GRI Field
Benzene	0.0010	0.0007480470 lb/MMBtu	GRI Field
Toluene	0.0013	0.0010163310 lb/MMBtu	GRI Field
Ethylbenzene	0.0028	0.0021128220 lb/MMBtu	GRI Field
Xylenes(m,p,o)	0.0017	0.0013205140 lb/MMBtu	GRI Field
2,2,4-Trimethylpentane	0.0037	0.0028417580 lb/MMBtu	GRI Field
n-Hexane	0.0018	0.0014070660 lb/MMBtu	GRI Field
Phenol	0.0000	0.0000001070 lb/MMBtu	GRI Field
Styrene	0.0027	0.0020788960 lb/MMBtu	GRI Field
Naphthalene	0.0000	0.0000005100 lb/MMBtu	GRI Field
2-Methylnaphthalene	0.0000	0.0000001470 lb/MMBtu	GRI Field
Acenaphthylene	0.0000	0.0000000670 lb/MMBtu	GRI Field
Biphenyl	0.0000	0.0000004730 lb/MMBtu	GRI Field
Acenaphthene	0.0000	0.0000000900 lb/MMBtu	GRI Field
Fluorene	0.0000	0.0000000800 lb/MMBtu	GRI Field
Anthracene	0.0000	0.0000000870 lb/MMBtu	GRI Field
Phenanthrene	0.0000	0.0000000600 lb/MMBtu	GRI Field
Fluoranthene	0.0000	0.0000000900 lb/MMBtu	GRI Field
Pyrene	0.0000	0.0000000830 lb/MMBtu	GRI Field
Benz(a)anthracene	0.0000	0.0000000870 lb/MMBtu	GRI Field
Chrysene	0.0000	0.0000001170 lb/MMBtu	GRI Field
Benzo(a)pyrene	0.0000	0.0000000700 lb/MMBtu	GRI Field

Benzo(b)fluoranthene	0.0000	0.0000001500	lb/MMBtu	GRI Field
Benzo(k)fluoranthene	0.0000	0.0000007600	lb/MMBtu	GRI Field
Benzo(g,h,i)perylene	0.0000	0.0000002600	lb/MMBtu	GRI Field
Indeno(1,2,3-c,d)pyrene	0.0000	0.0000001200	lb/MMBtu	GRI Field
Dibenz(a,h)anthracene	0.0000	0.0000001030	lb/MMBtu	GRI Field
Lead	0.0000	0.0000004902	lb/MMBtu	EPA
Total	0.0188			

Criteria Pollutants

VOC	0.0071	0.0053921569	lb/MMBtu	EPA
PM	0.0098	0.0074509804	lb/MMBtu	EPA
PM, Condensible	0.0073	0.0055882353	lb/MMBtu	EPA
PM, Filterable	0.0024	0.0018627451	lb/MMBtu	EPA
CO	0.0425	0.0323636360	lb/MMBtu	GRI Field
NMHC	0.0112	0.0085294118	lb/MMBtu	EPA
NOx	0.1275	0.0970167730	lb/MMBtu	GRI Field
SO2	0.0008	0.0005880000	lb/MMBtu	EPA

Other Pollutants

Dichlorobenzene	0.0000	0.0000011765	lb/MMBtu	EPA
Methane	0.0138	0.0105212610	lb/MMBtu	GRI Field
Acetylene	0.0184	0.0140000000	lb/MMBtu	GRI Field
Ethylene	0.0012	0.0009476310	lb/MMBtu	GRI Field
Ethane	0.0035	0.0026312210	lb/MMBtu	GRI Field
Propylene	0.0031	0.0023454550	lb/MMBtu	GRI Field
Propane	0.0014	0.0010686280	lb/MMBtu	GRI Field
Isobutane	0.0019	0.0014640770	lb/MMBtu	GRI Field
Butane	0.0018	0.0013766990	lb/MMBtu	GRI Field
Cyclopentane	0.0015	0.0011304940	lb/MMBtu	GRI Field
Pentane	0.0046	0.0034671850	lb/MMBtu	GRI Field
n-Pentane	0.0019	0.0014221310	lb/MMBtu	GRI Field
Cyclohexane	0.0012	0.0009183830	lb/MMBtu	GRI Field
Methylcyclohexane	0.0029	0.0022011420	lb/MMBtu	GRI Field
n-Octane	0.0038	0.0028538830	lb/MMBtu	GRI Field
1,2,3-Trimethylbenzene	0.0045	0.0034224540	lb/MMBtu	GRI Field
1,2,4-Trimethylbenzene	0.0045	0.0034224540	lb/MMBtu	GRI Field
1,3,5-Trimethylbenzene	0.0045	0.0034224540	lb/MMBtu	GRI Field
n-Nonane	0.0048	0.0036604170	lb/MMBtu	GRI Field
CO2	154.5882	117.6470588235	lb/MMBtu	EPA

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO_x) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO_x[b]		CO	
	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS)[c]	280	A	84	B
Uncontrolled (Post-NSPS)[c]	190	A	84	B
Controlled - Low NO_x burners	140	A	84	B
Controlled - Flue gas recirculation	100	D	84	B
Small Boilers (<100) [1-01-006-02, 1-02-006-02, 1-03-006-02, 1-03-006-03]				
Uncontrolled	100	B	84	B
Controlled - Low NO_x burners	50	D	84	B
Controlled - Low NO_x burners/Flue gas recirculation	32	C	84	B
Tangential-Fired Boilers (All Sizes) [1-01-006-04]				
Uncontrolled	170	A	24	C
Controlled - Flue gas recirculation	76	D	98	D
Residential Furnaces (<0.3) [No SCC]				
Uncontrolled	94	B	40	B

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. Emission factors are based on an average natural gas higher heating value of 1,020 Btu/scf. To convert from $1b/10^6$ scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. SCC = Source Classification Code. ND = no data. NA = not applicable.

[b] Expressed as NO_2. For large and small wall fired boilers with SNCR control, apply a 24 percent reduction to the appropriate NO_X emission factor. For tangential-fired boilers with SNCR control, apply a 13 percent reduction to the appropriate NO_X emission factor.

[c] NSPS=New Source Performance Standard as defined in 40 CFR 60 Subparts D and Db. Post-NSPS units are boilers with greater than 250 MMBtu/hr of heat input that commenced construction modification, or reconstruction after August 17, 1971, and units with heat input capacities between 100 and 250 MMBtu/hr that commenced construction modification, or reconstruction after June 19, 1984.

TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to 1b/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. TOC = Total Organic Compounds. VOC = Volatile Organic Compounds.

[b] Based on approximately 100% conversion of fuel carbon to CO_2. $CO_2[lb/10^6 \text{ scf}] = (3.67)(CON)(C)(D)$, where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, 4.2×10^4 $lb/10^6$ scf.

[c] All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM_{10}, $PM_{2.5}$ or PM_1 emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.

[d] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content is natural gas of 2,000 grains/10^6 scf. The SO_2 emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO_2 emission factor by the ratio of the site-specific sulfur content (grains/10^6 scf) to 2,000 grains/10^6 scf.

Turbine & Compressor Blowdown PTE Emissions Calculations

Unit Number: SSM
Description: Turbine, Compressor & Piping Associated With Station

Throughput

1	# of units	Number of units	Harvest Four Corners, LLC
100	events/yr/unit	Blowdowns per year per unit	Harvest Four Corners, LLC
5,780	scf/event	Gas loss per blowdown (compressor)	Harvest Four Corners, LLC
12,400	scf/event	Gas loss per blowdown (turbine)	Harvest Four Corners, LLC
1,818,000	scf/yr	Annual gas loss	# of units x events/yr/unit x [scf/event (compressor) + scf/event (turbine)]

Emission Rates

Pollutants	Emission Factors, lb/scf	Uncontrolled, Emission Rates, tpy
VOC	1.307E-02	11.88
Benzene	2.533E-05	2.30E-02
Ethylbenzene	5.598E-07	5.09E-04
n-Hexane	2.951E-04	2.68E-01
Isooctane	7.398E-06	6.72E-03
Toluene	4.008E-05	3.64E-02
Xylene	6.718E-06	6.11E-03

Emission factors calculated from gas composition (see table below)
Uncontrolled Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

Gas Composition

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Carbon dioxide	0.8632	44.01	1.002E-03
Hydrogen sulfide	0.0000	34.07	0.000E+00
Nitrogen	0.4462	28.01	3.295E-04
Methane	78.7294	16.04	3.329E-02
Ethane	10.7901	30.07	8.554E-03
Propane	5.0734	44.09	5.897E-03
Isobutane	0.8940	58.12	1.370E-03
n-Butane	1.5609	58.12	2.392E-03
Isopentane	0.5577	72.15	1.061E-03
n-Pentane	0.4298	72.15	8.176E-04
Cyclopentane	0.0189	70.14	3.495E-05
n-Hexane	0.1299	86.17	2.951E-04
Cyclohexane	0.0389	84.16	8.631E-05
Other hexanes	0.2872	86.18	6.525E-04
Heptanes	0.0720	100.20	1.902E-04
Methylcyclohexane	0.0556	98.19	1.439E-04
Isooctane	0.0028	100.21	7.398E-06
Benzene	0.0123	78.11	2.533E-05
Toluene	0.0165	92.14	4.008E-05
Ethylbenzene	0.0002	106.17	5.598E-07
Xylenes	0.0024	106.17	6.718E-06
C8+ Heavies	0.0187	110.00	5.423E-05
Total	100.0001		
Total VOC			1.307E-02

Gas stream composition obtained from Los Mestenios extended gas analysis dated 05/06/2021
Emission Factors (lb/scf) = (% / 100) x lb/lb-mole / 379.3 scf/lb-mole

Compressor Blowdown PTE Emissions Calculations

Unit Number: SSM
Description: RICE Compressor & Piping Associated With Station

Throughput

1	# of units	Number of units	Harvest Four Corners, LLC
100	events/yr/unit	Blowdowns per year per unit	Harvest Four Corners, LLC
6,442	scf/event	Gas loss per blowdown	Harvest Four Corners, LLC
644,200	scf/yr	Annual gas loss	# of units x events/yr/unit x scf/event

Emission Rates

Pollutants	Emission Factors, lb/scf	Uncontrolled, Emission Rates, tpy
VOC	1.307E-02	4.21
Benzene	2.533E-05	8.16E-03
Ethylbenzene	5.598E-07	1.80E-04
n-Hexane	2.951E-04	9.51E-02
Isooctane	7.398E-06	2.38E-03
Toluene	4.008E-05	1.29E-02
Xylene	6.718E-06	2.16E-03

Emission factors calculated from gas composition (see table below)
Uncontrolled Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

Gas Composition

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Carbon dioxide	0.8632	44.01	1.002E-03
Hydrogen sulfide	0.0000	34.07	0.000E+00
Nitrogen	0.4462	28.01	3.295E-04
Methane	78.7294	16.04	3.329E-02
Ethane	10.7901	30.07	8.554E-03
Propane	5.0734	44.09	5.897E-03
Isobutane	0.8940	58.12	1.370E-03
n-Butane	1.5609	58.12	2.392E-03
Isopentane	0.5577	72.15	1.061E-03
n-Pentane	0.4298	72.15	8.176E-04
Cyclopentane	0.0189	70.14	3.495E-05
n-Hexane	0.1299	86.17	2.951E-04
Cyclohexane	0.0389	84.16	8.631E-05
Other hexanes	0.2872	86.18	6.525E-04
Heptanes	0.0720	100.20	1.902E-04
Methylcyclohexane	0.0556	98.19	1.439E-04
Isooctane	0.0028	100.21	7.398E-06
Benzene	0.0123	78.11	2.533E-05
Toluene	0.0165	92.14	4.008E-05
Ethylbenzene	0.0002	106.17	5.598E-07
Xylenes	0.0024	106.17	6.718E-06
C8+ Heavies	0.0187	110.00	5.423E-05
Total	100.0001		
Total VOC			1.307E-02

Gas stream composition obtained from Los Mestenios extended gas analysis dated 05/06/2021
Emission Factors (lb/scf) = (% / 100) x lb/lb-mole / 379.3 scf/lb-mole

Description:	Los Mestenios	Company:	HARVEST MIDSTREAM
Field:		WorkOrder:	
Meter Number:		GPA Method:	GPA 2286
Analysis Date/Time:	5/7/2021 11:17:24	Sampled By:	
Date Sampled:	5/6/2021	Analyst Initials:	PK
Sample Temperature:	60	Instrument:	SRI 8610
Sample Pressure:	66		

GRI GlyCalc Information

Component	Mol%	Normalized Weight %
Carbon Dioxide	0.8632	1.7763
Hydrogen Sulfide	N/R	0
Nitrogen	0.4462	0.5845
Methane	78.7294	59.0586
Ethane	10.7901	15.1712
Propane	5.0734	10.4609
Iso-Butane	0.894	2.4297
n-Butane	1.5609	4.2421
Iso-Pentane	0.5577	1.8815
n-Pentane	0.4298	1.45
Cyclopentane	0.0189	0.062
n-Hexane	0.1299	0.5483
Cyclohexane	0.0389	0.1531
Other Hexanes	0.2872	1.3456
Heptanes	0.072	0.3373
Methylcyclohexane	0.0556	0.2553
2 2 4 Trimethylpentane	0.0028	0.015
Benzene	0.0123	0.0449
Toluene	0.0165	0.0711
Ethylbenzene	0.0002	0.001
Xylenes	0.0024	0.0119
C8+ Heavies	0.0187	0.0999
Subtotal	100.0001	
Oxygen	N/R	
Subtotal	100.0001	100

Calculated Molecular Weight	21.3865

2030 Afton Place
Farmington, NM 87401
(505) 325-6622

Analysis No: HM2021049
Cust No: 33700-10375

Well/Lease Information

Customer Name:	HARVEST MIDSTREAM	Source:	METER RUN
Well Name:	Los Mestenios CDP	Well Flowing:	Y
County/State:		Pressure:	80 PSIG
Location:		Flow Temp:	60 DEG. F
Lease/PA/CA:		Ambient Temp:	72 DEG. F
Formation:		Flow Rate:	MCF/D
Cust. Stn. No.:		Sample Method:	Purge & Fill
		Sample Date:	05/06/2021
		Sample Time:	2.10 PM
		Sampled By:	
Heat Trace:	N	Sampled by (CO):	Harvest Mid.
Remarks:	Calculated Molecular Weight = 21.3865		

Analysis

Component:	Mole%:	Unormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.4462	0.4456	0.0490	0.00	0.0043
CO2	0.8632	0.8621	0.1480	0.00	0.0131
Methane	78.7294	78.6321	13.3930	795.17	0.4361
Ethane	10.7901	10.7768	2.8960	190.95	0.1120
Propane	5.0734	5.0671	1.4030	127.65	0.0772
Iso-Butane	0.8940	0.8929	0.2940	29.07	0.0179
N-Butane	1.5609	1.5590	0.4940	50.92	0.0313
Neopentane 2,2 dmc3	0.0000	0.0000	0.0000	0.00	0.0000
I-Pentane	0.5577	0.5570	0.2050	22.31	0.0139
N-Pentane	0.4298	0.4293	0.1560	17.23	0.0107
Neohexane	0.0117	N/R	0.0050	0.55	0.0003
2-3-Dimethylbutane	0.0181	N/R	0.0070	0.86	0.0005
Cyclopentane	0.0189	N/R	0.0060	0.71	0.0005
2-Methylpentane	0.1220	N/R	0.0510	5.79	0.0036
3-Methylpentane	0.0464	N/R	0.0190	2.20	0.0014
C6	0.1299	0.6545	0.0540	6.18	0.0039
Methylcyclopentane	0.0890	N/R	0.0320	4.01	0.0026
Benzene	0.0123	N/R	0.0030	0.46	0.0003
Cyclohexane	0.0389	N/R	0.0130	1.74	0.0011
2-Methylhexane	0.0143	N/R	0.0070	0.78	0.0005
3-Methylhexane	0.0156	N/R	0.0070	0.85	0.0005
2-2-4-Trimethylpentane	0.0028	N/R	0.0010	0.17	0.0001
i-heptanes	0.0091	N/R	0.0040	0.48	0.0003
Heptane	0.0330	N/R	0.0150	1.82	0.0011

Methylcyclohexane	0.0556	N/R	0.0220	2.90	0.0019
Toluene	0.0165	N/R	0.0060	0.74	0.0005
2-Methylheptane	0.0064	N/R	0.0030	0.40	0.0003
4-Methylheptane	0.0033	N/R	0.0020	0.20	0.0001
i-Octanes	0.0026	N/R	0.0010	0.16	0.0001
Octane	0.0056	N/R	0.0030	0.35	0.0002
Ethylbenzene	0.0002	N/R	0.0000	0.01	0.0000
m, p Xylene	0.0022	N/R	0.0010	0.11	0.0001
o Xylene (& 2,2,4 tmc7)	0.0002	N/R	0.0000	0.01	0.0000
i-C9	0.0002	N/R	0.0000	0.01	0.0000
C9	0.0003	N/R	0.0000	0.02	0.0000
i-C10	0.0001	N/R	0.0000	0.01	0.0000
C10	0.0001	N/R	0.0000	0.01	0.0000
i-C11	0.0000	N/R	0.0000	0.00	0.0000
C11	0.0001	N/R	0.0000	0.01	0.0000
C12P	0.0000	N/R	0.0000	0.00	0.0000
Total	100.00	99.876	19.300	1264.86	0.7368

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY
**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBLITY FACTOR (1/Z):	1.0037	CYLINDER #:	16
BTU/CU.FT IDEAL:	1267.8	CYLINDER PRESSURE:	66 PSIG
BTU/CU.FT (DRY) CORRECTED FOR (1/Z):	1272.5	ANALYSIS DATE:	05/07/2021
BTU/CU.FT (WET) CORRECTED FOR (1/Z):	1250.4	ANALYIS TIME:	11:17:24 AM
DRY BTU @ 15.025:	1298.0	ANALYSIS RUN BY:	PATRICIA KING
REAL SPECIFIC GRAVITY:	0.7392		

GPM, BTU, and SPG calculations as shown above are based on current GPA constants.
GPA Standard: GPA 2286-14
GC: SRI Instruments 8610 **Last Cal/Verify: 05/11/2021**
GC Method: C12+BTEX Gas

Equipment Leaks PTE Emissions Calculations

Unit Number: F1
Description: Valves, Connectors, Seals & Open-Ended Lines

Steady-State Emission Rates

Equipment	Number of Components, # of sources	Emission Factors, kg/hr/source	Emission Factors, lb/hr/source	Uncontrolled TOC Emission Rates, pph	tpy
Valves	315	0.0045	0.0099	3.12	13.66
Connectors	263	0.0002	0.0004	0.12	0.51
Pump Seals	0	0.0024	0.0053	0.00	0.00
Compressor Seals	32	0.0088	0.0194	0.62	2.71
Pressure Relief Valves	19	0.0088	0.0194	0.37	1.61
Open-Ended Lines	88	0.0020	0.0044	0.39	1.70
Total				**4.61**	**20.19**

Number of components based on the numbers of compressors and dehydrators at the station (see next page)
Emission factors taken from the EPA "1995 Protocol for Equipment Leak Emission Estimates"
Emission factors (lb/hr/source) = Emission factors (kg/hr/source) x 2.2 lb/kg
Uncontrolled TOC Emission Rates (pph) = lb/hr/source x # of sources
Uncontrolled TOC Emission Rates (tpy) = Uncontrolled TOC Emission Rates (pph) x 8,760 hr/yr / 2,000 lb/ton

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Component Weights, lb/lb-mole	Weight Percent of TOC, %	Uncontrolled Emission Rates, pph	tpy
Carbon dioxide	0.8632	44.010				
Hydrogen sulfide	0.0000	34.070				
Nitrogen	0.4462	28.013				
Methane	78.7294	16.043	1263.056	60.619		
Ethane	10.7901	30.070	324.458	15.572		
Propane	5.0734	44.097	223.722	10.737	4.95E-01	2.17E+00
Isobutane	0.8940	58.123	51.962	2.494	1.15E-01	5.03E-01
n-Butane	1.5609	58.123	90.724	4.354	2.01E-01	8.79E-01
Isopentane	0.5577	72.150	40.238	1.931	8.90E-02	3.90E-01
n-Pentane	0.4298	72.150	31.010	1.488	6.86E-02	3.00E-01
Cyclopentane	0.0189	70.134	1.326	0.064	2.93E-03	1.28E-02
n-Hexane	0.1299	86.177	11.194	0.537	2.48E-02	1.08E-01
Cyclohexane	0.0389	84.161	3.274	0.157	7.24E-03	3.17E-02
Other hexanes	0.2872	86.177	24.750	1.188	5.47E-02	2.40E-01
Heptanes	0.0720	100.204	7.215	0.346	1.60E-02	6.99E-02
Methylcyclohexane	0.0556	98.188	5.459	0.262	1.21E-02	5.29E-02
Isooctane	0.0028	114.231	0.320	0.015	7.07E-04	3.10E-03
Benzene	0.0123	78.114	0.961	0.046	2.13E-03	9.31E-03
Toluene	0.0165	92.141	1.520	0.073	3.36E-03	1.47E-02
Ethylbenzene	0.0002	106.167	0.021	0.001	4.70E-05	2.06E-04
Xylenes	0.0024	106.167	0.255	0.012	5.64E-04	2.47E-03
C8+ Heavies	0.0187	114.231	2.136	0.103	4.72E-03	2.07E-02
Total	100.0001		2083.601			
Total VOC				23.809	1.10	4.81

Gas stream composition obtained from Los Mestenios extended gas analysis dated 05/06/2021
Component Weights (lb/lb-mole) = (% / 100) * Molecular Weights (lb/lb-mole)
Weight Percent of TOC (%) = 100 x Component Weights (lb/lb-mole) / Total Component Weight (lb/lb-mole)
Uncontrolled Emission Rates (pph) = Total Uncontrolled TOC Emission Rate (pph) x (% / 100)
Uncontrolled Emission Rates (tpy) = Total Uncontrolled TOC Emission Rate (tpy) x (% / 100)

Equipment Leaks PTE Emissions Calculations

Unit Number: F1
Description: Valves, Connectors, Seals & Lines

Number of Compression Units at the Facility: 2
Number of Dehydrators at the Facility: 0

Process Equipment Description	Equipment Count						Instrument Count		
	Valves	Connectors	Pump Seals	Compressor Seals	Pressure Relief Valves	Open-end	Flow	Level	Pressure
Station inlet, meter run to pulsation dampener	17	14	0	0	1	13	3	0	3
Pulsation dampener	12	8	0	0	0	2	0	4	1
Compressor suction header	7	4	0	0	0	3	0	0	1
Suction header feed to instrument gas header	3	1	0	0	0	1	0	0	0
Compressor discharge header and bypass to station discharge	6	5	0	0	0	3	0	1	1
Compressor discharge header and suction header bypass lines	4	2	0	0	0	2	0	0	1
Fuel gas header	2	2	0	0	1	2	0	0	1
Instrument gas header	2	2	0	0	1	2	0	0	0
Station discharge header	9	5	0	0	1	6	0	0	2
Fuel gas recovery header	2	2	0	0	1	2	0	0	0
Fuel gas feed and filter loop	15	9	0	0	0	1	0	4	1
Instrument gas feed and filter loop	9	11	0	0	0	3	0	0	0
Produced water storage tank	1	0	0	0	0	1	0	1	0
ESD panel	12	0	0	0	0	0	0	0	0
Starting gas header	6	2	0	0	1	3	0	0	0
Hot gas header	2	2	0	0	0	2	0	0	0
Volume bottle lop	12	4	0	24	1	2	0	0	1
Components from Compressors	88	118	0	8	12	22	0	8	18
Components from dehydrators	0	0	0	0	0	0	0	0	0
Total	209	191	0	32	19	70	3	18	30
Adjusted Total	315	263	0	32	19	88			

The following additions are included in the Adjusted Total:

1 valve is added for each open end line
2 connectors are added for each flow meter
2 valves, 2 connectors and 1 open end line are added for each level gauge
1 connector is added for each pressure gauge

The component count is based on an evaluation of the Sim Mesa Compressor Station (two stage compression)

TABLE 2-4. OIL AND GAS PRODUCTION OPERATIONS AVERAGE EMISSION FACTORS (kg/hr/source)

Equipment Type	Service[a]	Emission Factor (kg/hr/source)[b]
Valves	Gas	4.5E-03
	Heavy Oil	8.4E-06
	Light Oil	2.5E-03
	Water/Oil	9.8E-05
Pump seals	Gas	2.4E-03
	Heavy Oil	NA
	Light Oil	1.3E-02
	Water/Oil	2.4E-05
Others[c]	Gas	8.8E-03
	Heavy Oil	3.2E-05
	Light Oil	7.5E-03
	Water/Oil	1.4E-02
Connectors	Gas	2.0E-04
	Heavy Oil	7.5E-06
	Light Oil	2.1E-04
	Water/Oil	1.1E-04
Flanges	Gas	3.9E-04
	Heavy Oil	3.9E-07
	Light Oil	1.1E-04
	Water/Oil	2.9E-06
Open-ended lines	Gas	2.0E-03
	Heavy Oil	1.4E-04
	Light Oil	1.4E-03
	Water/Oil	2.5E-04

[a]Water/Oil emission factors apply to water streams in oil service with a water content greater than 50%, from the point of origin to the point where the water content reaches 99%. For water streams with a water content greater than 99%, the emission rate is considered negligible.

[b]These factors are for total organic compound emission rates (including non-VOC's such as methane and ethane) and apply to light crude, heavy crude, gas plant, gas production, and off shore facilities. "NA" indicates that not enough data were available to develop the indicated emission factor.

[c]The "other" equipment type was derived from compressors, diaphrams, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents. This "other" equipment type should be applied for any equipment type other than connectors, flanges, open-ended lines, pumps, or valves.

Truck Loading (Condensate) PTE Emissions Calculations

Unit Number: L1
Description: Truck Loading

Emission Factor

0.6		Saturation factor, S	AP-42, Table 5.2-1 (submerged loading & dedicated service)
2.28	psia	True vapor pressure of liquid, P	TANKS 4.0 output file
78.1	lb/lb-mole	Molecular weight of vapors, M	TANKS 4.0 output file
65	°F	Temperature of liquid	TANKS 4.0 output file
524.6	°R	Temperature of liquid, T	°F + 459.67
2.54	lb/10^3 gal	Emission factor, L	AP-42, Section 5.2, Equation 1 L =12.46 (SPM/T)

Production Rate

929.92	10^3 gal/yr	Maximum annual production rate (= 21,000 bbl/yr, which is approx. max historical throughput plus 10%)	Harvest Four Corners, LLC

Steady-State Emission Rates

Pollutant	Emission Rates, tpy
VOC	1.18

Emission Rate (tpy) = lb/10^3 gal x 10^3 gal/yr / 2,000 lb/ton

Pollutants	Percent of VOC, %	Emission Rates, tpy
Benzene	0.50	5.84E-03
Ethylbenzene	0.03	3.21E-04
n-Hexane	5.40	6.37E-02
Isooctane	0.10	1.17E-03
Toluene	0.07	7.68E-04
m-Xylene	0.16	1.86E-03

Liquid percent of VOC calculated from the TANKS 4.0 results
Percent of VOC (%) = 100 x Pollutant Emission Rate (lb/yr) / Total VOC Emission Rate (lb/yr)
Emission Rates (tpy) = VOC Emission Rate (tpy) x (% / 100)

Truck Loading (Produced Water) PTE Emissions Calculations

Unit Number: L2
Description: Truck Loading

Emission Factor

0.6		Saturation factor, S	AP-42, Table 5.2-1 (submerged loading & dedicated service)
0.3045	psia (average)	True vapor pressure of liquid, P	Estimated using Antoine's Equation (see calculations below)
18.02	lb/lb-mole	Molecular weight of vapors, M	TANKS 4.0 Database
65	°F (average)	Temperature of liquid	Estimated (see calculations below)
524.67	°R (average)	Temperature of liquid, T	°F + 459.67
0.08	lb/10^3 gal (average)	Emission factor, L	AP-42, Section 5.2, $L = 12.46 \frac{SPM}{T}$

Production Rate

35.28	10^3 gal/yr	Maximum annual production rate	Harvest Four Corners, LLC

Steady-State Emission Rates

Pollutant	Emission Rates, tpy
VOC	1.38E-03

Uncontrolled Emission Rate (tpy) = lb/10^3 gal x 10^3 gal/yr / 2,000 lb/ton

Pollutants	Mass Fraction	Emission Rates, tpy
Benzene	0.0267	3.69E-07
Ethylbenzene	0.0027	3.69E-08
n-Hexane	0.0840	1.16E-06
Toluene	0.0344	4.74E-07
m-Xylene	0.0229	3.16E-07

HAP mass fractions are estimated from the produced water tank emission factors
HAP Mass Fraction = HAP Emission Factor (lb/bbl) / VOC Emission Factor (lb/bbl)
Emission Rates (tpy) = VOC Emission Rate (tpy) x HAP Mass Fraction

Vapor Pressure of Produced Water:

It is estimated that the true vapor pressure of produced water is approximately equal to the true vapor pressure of pure water.
An estimate of the true vapor pressure for water is calculated using Antoine's equation (see AP-42, Section 7.1, Equation 1-25).

Maximum:

Temperature = 77 °F

log P = A - (B / (C + T))

A = 8.07131
B = 1730.63
C = 233.426
T = 25.00 °C
P = mmHg

P = 10^(A - (B / (C + T))

P = 23.69 mmHg
P = 0.4581 psi

Average:

Temperature = 65 °F

log P = A - (B / (C + T))

A = 8.07131
B = 1730.63
C = 233.426
T = 18.33 °C
P = mmHg

P = 10^(A - (B / (C + T))

P = 15.75 mmHg
P = 0.3045 psi

Note: 760 mmHg = 14.7 psia

loading operation, resulting in high levels of vapor generation and loss. If the turbulence is great enough, liquid droplets will be entrained in the vented vapors.

A second method of loading is submerged loading. Two types are the submerged fill pipe method and the bottom loading method. In the submerged fill pipe method, the fill pipe extends almost to the bottom of the cargo tank. In the bottom loading method, a permanent fill pipe is attached to the cargo tank bottom. During most of submerged loading by both methods, the fill pipe opening is below the liquid surface level. Liquid turbulence is controlled significantly during submerged loading, resulting in much lower vapor generation than encountered during splash loading.

The recent loading history of a cargo carrier is just as important a factor in loading losses as the method of loading. If the carrier has carried a nonvolatile liquid such as fuel oil, or has just been cleaned, it will contain vapor-free air. If it has just carried gasoline and has not been vented, the air in the carrier tank will contain volatile organic vapors, which will be expelled during the loading operation along with newly generated vapors.

Cargo carriers are sometimes designated to transport only one product, and in such cases are practicing "dedicated service". Dedicated gasoline cargo tanks return to a loading terminal containing air fully or partially saturated with vapor from the previous load. Cargo tanks may also be "switch loaded" with various products, so that a nonvolatile product being loaded may expel the vapors remaining from a previous load of a volatile product such as gasoline. These circumstances vary with the type of cargo tank and with the ownership of the carrier, the petroleum liquids being transported, geographic location, and season of the year.

One control measure for vapors displaced during liquid loading is called "vapor balance service", in which the cargo tank retrieves the vapors displaced during product unloading at bulk plants or service stations and transports the vapors back to the loading terminal. Figure 5.2-5 shows a tank truck in vapor balance service filling a service station underground tank and taking on displaced gasoline vapors for return to the terminal. A cargo tank returning to a bulk terminal in vapor balance service normally is saturated with organic vapors, and the presence of these vapors at the start of submerged loading of the tanker truck results in greater loading losses than encountered during nonvapor balance, or "normal", service. Vapor balance service is usually not practiced with marine vessels, although some vessels practice emission control by means of vapor transfer within their own cargo tanks during ballasting operations, discussed below.

Emissions from loading petroleum liquid can be estimated (with a probable error of ±30 percent)[4] using the following expression:

$$L_L = 12.46 \frac{SPM}{T} \quad (1)$$

where:

L_L = loading loss, pounds per 1000 gallons ($lb/10^3$ gal) of liquid loaded

S = a saturation factor (see Table 5.2-1)
P = true vapor pressure of liquid loaded, pounds per square inch absolute (psia) (see Figure 7.1-5, Figure 7.1-6, and Table 7.1-2)
M = molecular weight of vapors, pounds per pound-mole (lb/lb-mole) (see Table 7.1-2)
T = temperature of bulk liquid loaded, °R (°F + 460)

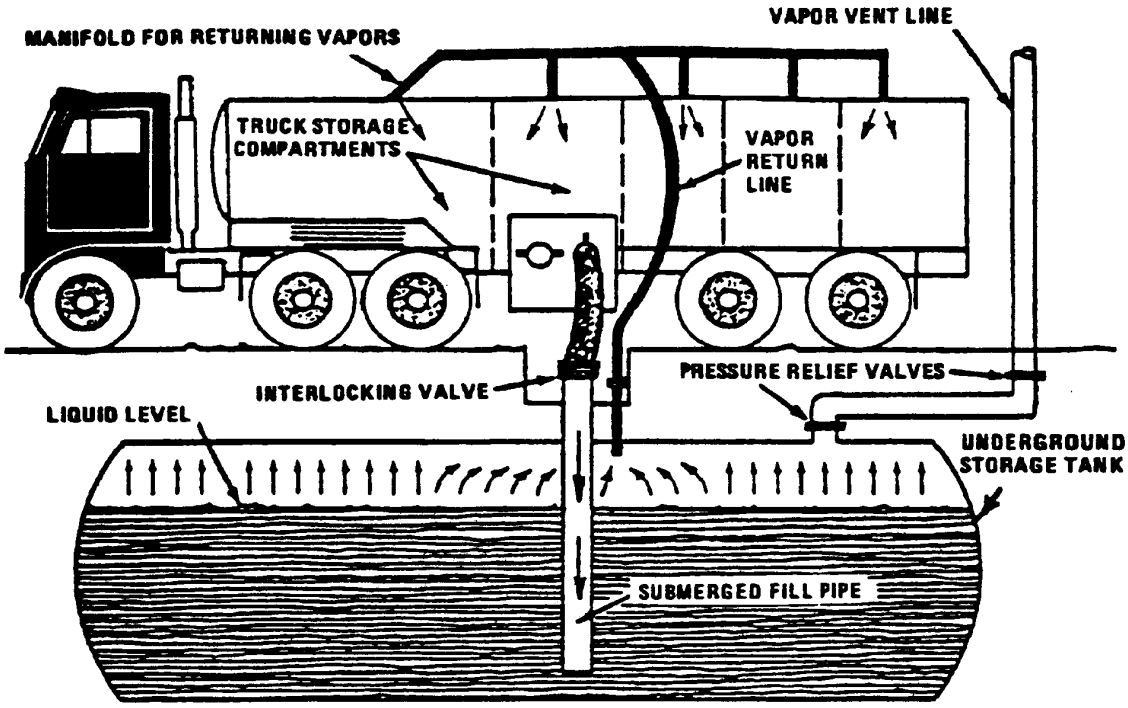


Figure 5.2-5. Tank truck unloading into a service station underground storage tank and practicing "vapor balance" form of emission control.

Table 5.2-1. SATURATION (S) FACTORS FOR CALCULATING PETROLEUM LIQUID LOADING LOSSES

Cargo Carrier	Mode Of Operation	S Factor
Tank trucks and rail tank cars	Submerged loading of a clean cargo tank	0.50
	Submerged loading: dedicated normal service	0.60
	Submerged loading: dedicated vapor balance service	1.00
	Splash loading of a clean cargo tank	1.45
	Splash loading: dedicated normal service	1.45
	Splash loading: dedicated vapor balance service	1.00
Marine vessels[a]	Submerged loading: ships	0.2
	Submerged loading: barges	0.5

[a] For products other than gasoline and crude oil. For marine loading of gasoline, use factors from Table 5.2-2. For marine loading of crude oil, use Equations 2 and 3 and Table 5.2-3.

The saturation factor, S, represents the expelled vapor's fractional approach to saturation, and it accounts for the variations observed in emission rates from the different unloading and loading methods. Table 5.2-1 lists suggested saturation factors.

Emissions from controlled loading operations can be calculated by multiplying the uncontrolled emission rate calculated in Equation 1 by an overall reduction efficiency term:

$$\left(1 - \frac{\text{eff}}{100}\right)$$

The overall reduction efficiency should account for the capture efficiency of the collection system as well as both the control efficiency and any downtime of the control device. Measures to reduce loading emissions include selection of alternate loading methods and application of vapor recovery equipment. The latter captures organic vapors displaced during loading operations and recovers the vapors by the use of refrigeration, absorption, adsorption, and/or compression. The recovered product is piped back to storage. Vapors can also be controlled through combustion in a thermal oxidation unit, with no product recovery. Figure 5.2-6 demonstrates the recovery of gasoline vapors from tank trucks during loading operations at bulk terminals. Control efficiencies for the recovery units range from 90 to over 99 percent, depending on both the nature of the vapors and the type of control equipment used.[5-6] However, not all of the displaced vapors reach the control device, because of leakage from both the tank truck and collection system. The collection efficiency should be assumed to be 99.2 percent for tanker trucks passing the MACT-level annual leak test (not more than 1 inch water column pressure change in 5 minutes after pressurizing to 18 inches water followed by pulling a vacuum of 6 inches water).[7] A collection efficiency of 98.7 percent (a 1.3 percent leakage rate) should be assumed for trucks passing the NSPS-level annual test (3 inches pressure change) A collection efficiency of 70 percent should be assumed for trucks not passing one of these annual leak tests[6].

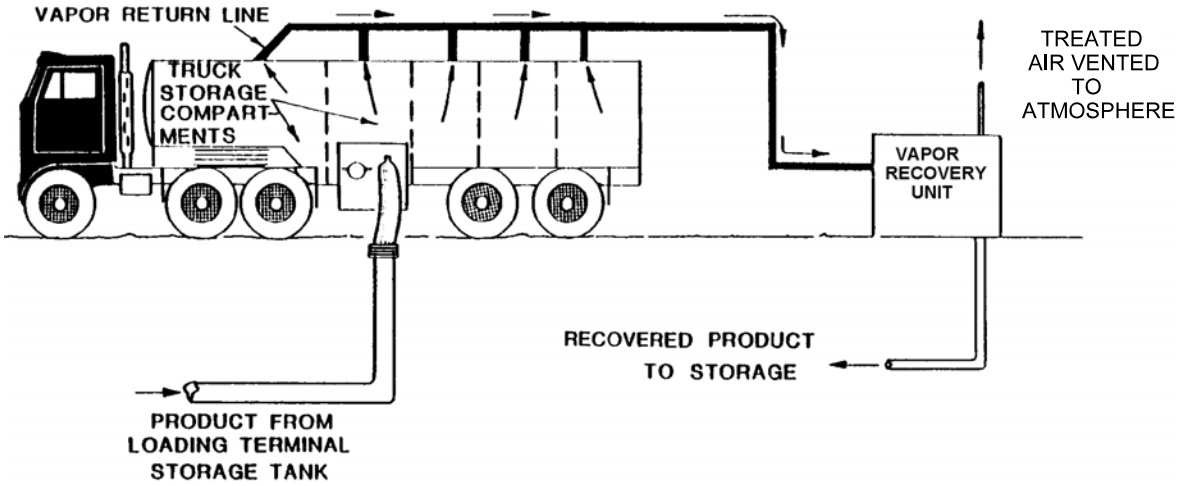


Figure 5.2-6. Tank truck loading with vapor recovery.

Storage Tank PTE Emissions Data and Calculations

Unit Number: T1 & T2
Description: Condensate Storage Tanks

Emission Rates

Source/Pollutants	Working/Breathing Losses, ppy	Working/Breathing Losses, tpy	Flash Losses, tpy	Uncontrolled Emission Rates, tpy	10% Safety Factor tpy
T1					
VOC	6,540.36	3.27	44.75	48.02	52.82
Benzene	37.76	1.89E-02	3.25E-01	3.44E-01	3.79E-01
Ethylbenzene	2.07	1.04E-03	1.62E-02	1.72E-02	1.89E-02
n-Hexane	412.11	2.06E-01	2.60	2.81	3.09
Isooctane	7.53	3.77E-03	4.56E-02	4.94E-02	5.43E-02
Toluene	4.96	2.48E-03	3.81E-02	4.06E-02	4.46E-02
Xylene	12.01	6.01E-03	7.99E-02	8.59E-02	9.45E-02
T2					
VOC	5,608.34	2.80	--	2.80	
Benzene	32.38	1.62E-02	--	1.62E-02	
Ethylbenzene	1.78	8.90E-04	--	8.90E-04	
n-Hexane	353.38	1.77E-01	--	1.77E-01	
Isooctane	6.46	3.23E-03	--	3.23E-03	
Toluene	4.26	2.13E-03	--	2.13E-03	
Xylene	10.30	5.15E-03	--	5.15E-03	

Working/breathing losses taken from TANKS 4.0 results
Flash VOC emissions taken from VMGSim results
Flash HAP emissions calculated from the flash VOC emissions and the weight % HAP (calculated in the table below)
Unit T2 does not have flash emissions because it is an overflow tank for Unit T1. All flashing occurs in Unit T1.

Storage Tank PTE Emissions Data and Calculations

Unit Number: T1 & T2
Description: Condensate Storage Tanks

Flash Emissions Composition (To Determine HAP Emissions)

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Component Weights, lb/lb-mole	Weight Percent, %
Carbon dioxide	0.1231	44.010		
Hydrogen sulfide	0.0000	34.070		
Nitrogen	1.4810	28.013		
Water	1.9137	18.015		
Methane	58.8518	16.043		
Ethane	9.5652	30.070		
Propane	3.1622	44.097	139.445	7.752
Isobutane	4.8689	58.123	282.998	15.732
n-Butane	9.3180	58.123	541.590	30.108
Isopentane	4.5581	72.150	328.870	18.282
n-Pentane	3.0399	72.150	219.325	12.193
Cyclopentane	0.0158	70.134	1.107	0.062
n-Hexane	1.2128	86.177	104.513	5.810
Cyclohexane	0.4511	84.161	37.966	2.111
Other hexanes	0.0000	86.177	0.000	0.000
Heptanes	0.6055	100.204	60.677	3.373
Methylcyclohexane	0.4106	98.188	40.317	2.241
Isooctane	0.0160	114.231	1.833	0.102
Benzene	0.1674	78.114	13.074	0.727
Toluene	0.0166	92.141	1.532	0.085
Ethylbenzene	0.0061	106.167	0.651	0.036
Xylenes	0.0303	106.167	3.212	0.179
n-Octane	0.1544	114.232	17.643	0.981
n-Nonane	0.0262	128.259	3.355	0.187
n-Decane	0.0051	142.286	0.719	0.040
Total	100.0000		1798.826	100.000

Gas stream composition obtained from VGMSym output
Component Weights (lb/lb-mole) = (% / 100) * Molecular Weights (lb/lb-mole)
Weight Percent of TOC (%) = 100 x Component Weights (lb/lb-mole) / Total Component Weight (lb/lb-mole)

Storage Tank PTE Emissions Data and Calculations

Unit Number: T1 & T2
Description: Condensate Storage Tanks

Condensate Composition (To Determine Working/Breathing Losses)

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Component Weights, lb/lb-mole	Weight Percent, %
Carbon dioxide	0.0016	44.010		
Hydrogen sulfide	0.0000	34.070		
Nitrogen	0.0016	28.013		
Water	10.3467	18.015	186.3954	1.9609
Methane	0.2398	16.043	3.8476	0.0405
Ethane	0.2647	30.070	7.9592	0.0837
Propane	0.3284	44.097	14.4797	0.1523
Isobutane	1.3530	58.123	78.6407	0.8273
n-Butane	4.0043	58.123	232.7417	2.4485
Isopentane	5.2914	72.150	381.7734	4.0163
n-Pentane	4.7618	72.150	343.5631	3.6143
Cyclopentane	0.0479	70.134	3.3588	0.0353
n-Hexane	7.2009	86.177	620.5560	6.5283
Cyclohexane	4.2312	84.161	356.1035	3.7463
Other hexanes	0.0000	86.177	0.0000	0.0000
Heptanes	12.0651	100.204	1208.9690	12.7185
Methylcyclohexane	9.4637	98.188	929.2256	9.7756
Isooctane	0.3125	114.231	35.7007	0.3756
Benzene	1.1780	78.114	92.0162	0.9680
Toluene	0.4530	92.141	41.7421	0.4391
Ethylbenzene	0.4864	106.167	51.6357	0.5432
Xylenes	3.3752	106.167	358.3340	3.7697
n-Octane	10.1150	114.232	1155.4546	12.1555
n-Nonane	5.6876	128.259	729.4821	7.6743
n-Decane	18.7903	142.286	2673.5942	28.1266
Total	100.0000		9505.5736	100.0000

Gas stream composition obtained from VGMSym output
Component Weights (lb/lb-mole) = (% / 100) * Molecular Weights (lb/lb-mole)
Weight Percent of TOC (%) = 100 x Component Weights (lb/lb-mole) / Total Component Weight (lb/lb-mole)
In TANKS 4, the methane, ethane, and propane percentages are included with isobutane and n-butane (an even distribution)

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Los Mestenios - T1 - Condensate PTE
City:	Gavilan
State:	New Mexico
Company:	Harvest Four Corners, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	490 Barrel Condensate Storage Tank

Tank Dimensions

Shell Height (ft):	16.00
Diameter (ft):	14.75
Liquid Height (ft) :	15.00
Avg. Liquid Height (ft):	7.50
Volume (gallons):	19,173.00
Turnovers:	48.50
Net Throughput(gal/yr):	929,922.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	0.00
Radius (ft) (Dome Roof)	14.75

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Los Mestenios - T1 - Condensate PTE - Vertical Fixed Roof Tank
Gavilan, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate	All	67.36	53.93	80.79	59.23	3.4523	2.6161	4.3471	66.3334			95.42	
2,2,4-Trimethylpentane (isooctane)						0.7338	0.4989	1.0546	114.2300	0.0038	0.0011	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4274	0.9846	2.0237	78.1100	0.0097	0.0058	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Butane (-n)						29.9357	23.3576	34.6684	58.1230	0.0259	0.3227	58.12	Option 1: VP60 = 26.1 VP70 = 31.31
Cyclohexane						1.4738	1.0254	2.0729	84.1600	0.0375	0.0230	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Cyclopentane						4.9596	3.6370	6.6394	70.1300	0.0004	0.0007	70.13	Option 1: VP60 = 4.177 VP70 = 5.24
Decane (-n)						0.0395	0.0291	0.0536	142.2900	0.2813	0.0046	142.29	Option 1: VP60 = .033211 VP70 = .041762
Ethylbenzene						0.1396	0.0876	0.2162	106.1700	0.0054	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Heptane (-n)						0.7600	0.5088	1.1128	100.2000	0.1272	0.0403	100.20	Option 3: A=37358, B=8.2585
Hexane (-n)						2.3100	1.6303	3.2059	86.1700	0.0653	0.0628	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Iso-Butane						43.3083	34.4026	53.8185	58.1230	0.0097	0.1743	58.12	Option 1: VP60 = 38.14 VP70 = 45.16
Isopentane						11.8640	8.7212	15.5743	72.1500	0.0402	0.1985	72.15	Option 1: VP60 = 10.005 VP70 = 12.53
Methylcyclohexane						0.6886	0.4673	0.9913	98.1800	0.0978	0.0280	98.18	Option 2: A=6.823, B=1270.763, C=221.42
Nonane (-n)						0.0784	0.0568	0.1080	128.2600	0.0767	0.0025	128.26	Option 1: VP60 = .065278 VP70 = .08309
Octane (-n)						0.1769	0.1254	0.2493	114.2300	0.1216	0.0090	114.23	Option 1: VP60 = .145444 VP70 = .188224
Pentane (-n)						8.0308	5.9649	10.6537	72.1500	0.0361	0.1209	72.15	Option 3: A=27691, B=7.558
Toluene						0.4136	0.2726	0.6120	92.1300	0.0044	0.0008	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Water						0.3402	0.2160	0.5229	18.0150	0.0196	0.0028	18.02	Option 1: VP60 = .263 VP70 = .3679
Xylenes (mixed isomers)						0.1165	0.0728	0.1813	106.1700	0.0377	0.0018	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Los Mestenios - T1 - Condensate PTE - Vertical Fixed Roof Tank
Gavilan, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	2,577.2156
Vapor Space Volume (cu ft):	1,625.2961
Vapor Density (lb/cu ft):	0.0405
Vapor Space Expansion Factor:	0.2940
Vented Vapor Saturation Factor:	0.3649
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,625.2961
Tank Diameter (ft):	14.7500
Vapor Space Outage (ft):	9.5117
Tank Shell Height (ft):	16.0000
Average Liquid Height (ft):	7.5000
Roof Outage (ft):	1.0117
Roof Outage (Dome Roof)	
Roof Outage (ft):	1.0117
Dome Radius (ft):	14.7500
Shell Radius (ft):	7.3750
Vapor Density	
Vapor Density (lb/cu ft):	0.0405
Vapor Molecular Weight (lb/lb-mole):	66.3334
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Daily Avg. Liquid Surface Temp. (deg. R):	527.0322
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.9042
Tank Paint Solar Absorptance (Shell):	0.6800
Tank Paint Solar Absorptance (Roof):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.2940
Daily Vapor Temperature Range (deg. R):	53.7176
Daily Vapor Pressure Range (psia):	1.7309
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	2.6161
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	4.3471
Daily Avg. Liquid Surface Temp. (deg R):	527.0322
Daily Min. Liquid Surface Temp. (deg R):	513.6028
Daily Max. Liquid Surface Temp. (deg R):	540.4617
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3649
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	3.4523
Vapor Space Outage (ft):	9.5117
Working Losses (lb):	3,981.3785

Vapor Molecular Weight (lb/lb-mole):	66.3334
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Annual Net Throughput (gal/yr.):	929,922.0000
Annual Turnovers:	48.5000
Turnover Factor:	0.7852
Maximum Liquid Volume (gal):	19,173.0000
Maximum Liquid Height (ft):	15.0000
Tank Diameter (ft):	14.7500
Working Loss Product Factor:	1.0000

Total Losses (lb):	6,558.5942

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Los Mestenios - T1 - Condensate PTE - Vertical Fixed Roof Tank
Gavilan, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Condensate	3,981.38	2,577.22	6,558.59
Iso-Butane	693.82	449.12	1,142.94
Butane (-n)	1,284.65	831.58	2,116.23
Isopentane	790.47	511.69	1,302.16
Pentane (-n)	481.52	311.70	793.22
Cyclopentane	2.90	1.88	4.78
Hexane (-n)	250.17	161.94	412.11
Cyclohexane	91.60	59.29	150.89
Heptane (-n)	160.36	103.80	264.16
Methylcyclohexane	111.67	72.28	183.95
2,2,4-Trimethylpentane (isooctane)	4.57	2.96	7.53
Benzene	22.92	14.84	37.76
Toluene	3.01	1.95	4.96
Ethylbenzene	1.26	0.81	2.07
Xylenes (mixed isomers)	7.29	4.72	12.01
Octane (-n)	35.68	23.10	58.78
Nonane (-n)	9.98	6.46	16.44
Decane (-n)	18.43	11.93	30.37
Water	11.07	7.16	18.23

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Los Mestenios - T2 - Condensate PTE
City:	Gavilan
State:	New Mexico
Company:	Harvest Four Corners, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	400 Barrel Condensate Storage Tank

Tank Dimensions

Shell Height (ft):	16.00
Diameter (ft):	13.50
Liquid Height (ft) :	15.00
Avg. Liquid Height (ft):	7.50
Volume (gallons):	16,061.00
Turnovers:	57.90
Net Throughput(gal/yr):	929,922.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	0.00
Radius (ft) (Dome Roof)	13.50

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Los Mestenios - T2 - Condensate PTE - Vertical Fixed Roof Tank
Gavilan, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate	All	67.36	53.93	80.79	59.23	3.4523	2.6161	4.3471	66.3334			95.42	
2,2,4-Trimethylpentane (isooctane)						0.7338	0.4989	1.0546	114.2300	0.0038	0.0011	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4274	0.9846	2.0237	78.1100	0.0097	0.0058	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Butane (-n)						29.9357	23.3576	34.6684	58.1230	0.0259	0.3227	58.12	Option 1: VP60 = 26.1 VP70 = 31.31
Cyclohexane						1.4738	1.0254	2.0729	84.1600	0.0375	0.0230	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Cyclopentane						4.9596	3.6370	6.6394	70.1300	0.0004	0.0007	70.13	Option 1: VP60 = 4.177 VP70 = 5.24
Decane (-n)						0.0395	0.0291	0.0536	142.2900	0.2813	0.0046	142.29	Option 1: VP60 = .033211 VP70 = .041762
Ethylbenzene						0.1396	0.0876	0.2162	106.1700	0.0054	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Heptane (-n)						0.7600	0.5088	1.1128	100.2000	0.1272	0.0403	100.20	Option 3: A=37358, B=8.2585
Hexane (-n)						2.3100	1.6303	3.2059	86.1700	0.0653	0.0628	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Iso-Butane						43.3083	34.4026	53.8185	58.1230	0.0097	0.1743	58.12	Option 1: VP60 = 38.14 VP70 = 45.16
Isopentane						11.8640	8.7212	15.5743	72.1500	0.0402	0.1985	72.15	Option 1: VP60 = 10.005 VP70 = 12.53
Methylcyclohexane						0.6886	0.4673	0.9913	98.1800	0.0978	0.0280	98.18	Option 2: A=6.823, B=1270.763, C=221.42
Nonane (-n)						0.0784	0.0568	0.1080	128.2600	0.0767	0.0025	128.26	Option 1: VP60 = .065278 VP70 = .08309
Octane (-n)						0.1769	0.1254	0.2493	114.2300	0.1216	0.0090	114.23	Option 1: VP60 = .145444 VP70 = .188224
Pentane (-n)						8.0308	5.9649	10.6537	72.1500	0.0361	0.1209	72.15	Option 3: A=27691, B=7.558
Toluene						0.4136	0.2726	0.6120	92.1300	0.0044	0.0008	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Water						0.3402	0.2160	0.5229	18.0150	0.0196	0.0028	18.02	Option 1: VP60 = .263 VP70 = .3679
Xylenes (mixed isomers)						0.1165	0.0728	0.1813	106.1700	0.0377	0.0018	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Los Mestenios - T2 - Condensate PTE - Vertical Fixed Roof Tank
Gavilan, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	2,151.7664
Vapor Space Volume (cu ft):	1,349.2223
Vapor Density (lb/cu ft):	0.0405
Vapor Space Expansion Factor:	0.2940
Vented Vapor Saturation Factor:	0.3670
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,349.2223
Tank Diameter (ft):	13.5000
Vapor Space Outage (ft):	9.4260
Tank Shell Height (ft):	16.0000
Average Liquid Height (ft):	7.5000
Roof Outage (ft):	0.9260
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.9260
Dome Radius (ft):	13.5000
Shell Radius (ft):	6.7500
Vapor Density	
Vapor Density (lb/cu ft):	0.0405
Vapor Molecular Weight (lb/lb-mole):	66.3334
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Daily Avg. Liquid Surface Temp. (deg. R):	527.0322
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.9042
Tank Paint Solar Absorptance (Shell):	0.6800
Tank Paint Solar Absorptance (Roof):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.2940
Daily Vapor Temperature Range (deg. R):	53.7176
Daily Vapor Pressure Range (psia):	1.7309
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	2.6161
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	4.3471
Daily Avg. Liquid Surface Temp. (deg R):	527.0322
Daily Min. Liquid Surface Temp. (deg R):	513.6028
Daily Max. Liquid Surface Temp. (deg R):	540.4617
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3670
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	3.4523
Vapor Space Outage (ft):	9.4260
Working Losses (lb):	3,472.2012

Vapor Molecular Weight (lb/lb-mole):	66.3334
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Annual Net Throughput (gal/yr.):	929,922.0000
Annual Turnovers:	57.9000
Turnover Factor:	0.6848
Maximum Liquid Volume (gal):	16,061.0000
Maximum Liquid Height (ft):	15.0000
Tank Diameter (ft):	13.5000
Working Loss Product Factor:	1.0000

Total Losses (lb):	5,623.9676

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Los Mestenios - T2 - Condensate PTE - Vertical Fixed Roof Tank
Gavilan, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Condensate	3,472.20	2,151.77	5,623.97
Iso-Butane	605.09	374.98	980.06
Butane (-n)	1,120.36	694.30	1,814.66
Isopentane	689.38	427.22	1,116.60
Pentane (-n)	419.94	260.24	680.18
Cyclopentane	2.53	1.57	4.10
Hexane (-n)	218.18	135.21	353.38
Cyclohexane	79.88	49.50	129.39
Heptane (-n)	139.85	86.67	226.52
Methylcyclohexane	97.39	60.35	157.74
2,2,4-Trimethylpentane (isooctane)	3.99	2.47	6.46
Benzene	19.99	12.39	32.38
Toluene	2.63	1.63	4.26
Ethylbenzene	1.10	0.68	1.78
Xylenes (mixed isomers)	6.36	3.94	10.30
Octane (-n)	31.12	19.28	50.40
Nonane (-n)	8.70	5.39	14.10
Decane (-n)	16.08	9.96	26.04
Water	9.65	5.98	15.63

Simulation Report

Symmetry

File Name:	Los Mestenios Emissions Flash Model 12.21.2021
Company:	VMG, a Schlumberger Technology
Customer:	
Project:	
Job No:	
Prepared By:	
Report Date:	Tuesday, December 21, 2021
Unit Set:	Field

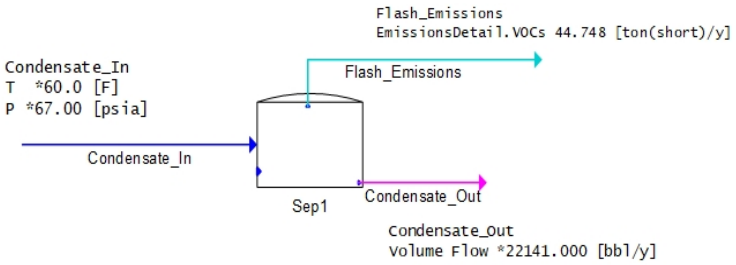
File: U:\Environmental\Los Mestenios Emissions Flash Model 12.21.2021.vsym

Symmetry

Main Flowsheet

*Bold face throughout the report denotes specified values.

*Italic face throughout the report denotes recycle values.


Flash_Emissions
EmissionsDetail.VOCs 44.748 [ton(short)/y]
Condensate_In
T *60.0 [F]
P *67.00 [psia]
Flash_Emissions
Condensate_In
Sep1
Condensate_Out
Condensate_Out
Volume Flow *22141.000 [bbl/y]

/Condensate_In (Material Stream)

Thermo Model: APRNGL2

Connections

Material Inlets

	Connection	Up Stream Unit Op
In	<Disconnected>	---

Material Outlets

	Connection	Down Stream Unit Op
Out	Sep1.In0	---

Allocation / Product Allocation

Auto Calculate	**False**	Is Up To Date	False
Status	Y?No Results		

Equilibrium Results

	Bulk	**Vap**	**Liq0**	**Liq1**
Phase Frac [Fraction]	1.00	0.0390	0.8649	0.0962
T [F]	60.0	60.0	60.0	60.0
P [psia]	67.00	67.00	67.00	67.00
Mole Flow [lbmol/h]	7.04	0.27	6.09	0.68
Mass Flow [lb/h]	657.72	5.59	639.94	12.19
Volume Flow [ft3/s]	0.010	0.006	0.004	0.000
Fraction [Fraction]				
NITROGEN	0.0012	0.0273	1.69E-04	1.39E-06
METHANE	0.0497	0.8415	0.0195	9.28E-05
CARBON DIOXIDE	1.14E-04	0.0011	8.10E-05	3.03E-06
ETHANE	0.0102	0.0590	0.0091	9.68E-06
PROPANE	0.0056	0.0105	0.0060	1.15E-06
ISOBUTANE	0.0164	0.0123	0.0184	7.47E-07
n-BUTANE	0.0443	0.0218	0.0503	1.96E-06
ISOPENTANE	0.0523	0.0098	0.0601	5.01E-07
n-PENTANE	0.0462	0.0065	0.0532	4.95E-07
CYCLOPENTANE	4.53E-04	3.28E-05	5.22E-04	1.90E-08
n-HEXANE	0.0672	0.0025	0.0776	1.89E-07
METHYLCYCLOHEXANE	0.0873	8.63E-04	0.1009	3.17E-07
2,2,4-TRIMETHYLPENTANE	0.0029	3.38E-05	0.0033	8.35E-10
BENZENE	0.0110	3.47E-04	0.0127	5.87E-06
CYCLOHEXANE	0.0393	9.37E-04	0.0454	5.73E-07
n-HEPTANE	0.1114	0.0013	0.1288	6.67E-08
TOLUENE	0.0042	3.47E-05	0.0048	5.99E-07
n-OCTANE	0.0931	3.30E-04	0.1076	1.08E-08
ETHYLBENZENE	0.0045	1.30E-05	0.0052	1.82E-07
m-XYLENE	0.0214	4.76E-05	0.0247	7.31E-07
o-XYLENE	0.0096	1.66E-05	0.0112	4.19E-07
n-NONANE	0.0523	5.68E-05	0.0605	5.32E-09
n-DECANE	0.0024	8.18E-07	0.0028	1.01E-10
n-UNDECANE	0.0852	8.06E-06	0.0985	1.31E-09
n-DODECANE	0.0852	2.53E-06	0.0985	6.27E-10
WATER	0.0967	0.0038	4.11E-04	0.9999

/Condensate_Out (Material Stream)

Thermo Model: APRNGL2

Connections

Material Inlets

	Connection	Up Stream Unit Op
In	Sep1.Liq0	---

Material Outlets

	Connection	Down Stream Unit Op
Out	<Disconnected>	---

Allocation / Product Allocation

Auto Calculate	**False**	Is Up To Date	False
Status	Y?No Results		

Equilibrium Results

	Bulk	**Vap**	**Liq0**	**Liq1**
Phase Frac [Fraction]	1.00	0.00	1.00	
T [F]	60.0	60.0	60.0	
P [psia]	13.00	13.00	13.00	
Mole Flow [lbmol/h]	6.47	0.00	6.47	
Mass Flow [lb/h]	640.04	0.00	640.04	
Volume Flow [ft3/s]	0.004	0.000	0.004	
Fraction [Fraction]				
NITROGEN	1.58E-05	0.0148	1.58E-05	
METHANE	0.0024	0.5885	0.0024	
CARBON DIOXIDE	1.59E-05	0.0012	1.59E-05	
ETHANE	0.0026	0.0957	0.0026	
PROPANE	0.0033	0.0316	0.0033	
ISOBUTANE	0.0135	0.0487	0.0135	
n-BUTANE	0.0400	0.0932	0.0400	
ISOPENTANE	0.0529	0.0456	0.0529	
n-PENTANE	0.0476	0.0304	0.0476	
CYCLOPENTANE	4.79E-04	1.58E-04	4.79E-04	
n-HEXANE	0.0720	0.0121	0.0720	
METHYLCYCLOHEXANE	0.0946	0.0041	0.0946	
2,2,4-TRIMETHYLPENTANE	0.0031	1.60E-04	0.0031	
BENZENE	0.0118	0.0017	0.0118	
CYCLOHEXANE	0.0423	0.0045	0.0423	
n-HEPTANE	0.1207	0.0061	0.1207	
TOLUENE	0.0045	1.66E-04	0.0045	
n-OCTANE	0.1011	0.0015	0.1011	
ETHYLBENZENE	0.0049	6.13E-05	0.0049	
m-XYLENE	0.0233	2.24E-04	0.0233	
o-XYLENE	0.0105	7.81E-05	0.0105	
n-NONANE	0.0569	2.62E-04	0.0569	
n-DECANE	0.0026	3.70E-06	0.0026	
n-UNDECANE	0.0926	3.58E-05	0.0926	
n-DODECANE	0.0926	1.10E-05	0.0926	
WATER	0.1035	0.0191	0.1035	

/Flash_Emissions (Material Stream)

Thermo Model: APRNGL2

Connections

Material Inlets

	Connection	Up Stream Unit Op
In	Sep1.Vap	---

Material Outlets

	Connection	Down Stream Unit Op
Out	<Disconnected>	---

Allocation / Product Allocation

Auto Calculate	**False**	Is Up To Date	False
Status	Y?No Results		

Equilibrium Results

	Bulk	**Vap**	**Liq0**	**Liq1**
Phase Frac [Fraction]	1.00	1.00	0.00	
T [F]	60.0	60.0	60.0	
P [psia]	13.00	13.00	13.00	
Mole Flow [lbmol/h]	0.57	0.57	0.00	
Mass Flow [lb/h]	17.67	17.67	0.00	
Volume Flow [ft3/s]	0.067	0.067	0.000	
Fraction [Fraction]				
NITROGEN	0.0148	0.0148	1.58E-05	
METHANE	0.5885	0.5885	0.0024	
CARBON DIOXIDE	0.0012	0.0012	1.59E-05	
ETHANE	0.0957	0.0957	0.0026	
PROPANE	0.0316	0.0316	0.0033	
ISOBUTANE	0.0487	0.0487	0.0135	
n-BUTANE	0.0932	0.0932	0.0400	
ISOPENTANE	0.0456	0.0456	0.0529	
n-PENTANE	0.0304	0.0304	0.0476	
CYCLOPENTANE	1.58E-04	1.58E-04	4.79E-04	
n-HEXANE	0.0121	0.0121	0.0720	
METHYLCYCLOHEXANE	0.0041	0.0041	0.0946	
2,2,4-TRIMETHYLPENTANE	1.60E-04	1.60E-04	0.0031	
BENZENE	0.0017	0.0017	0.0118	
CYCLOHEXANE	0.0045	0.0045	0.0423	
n-HEPTANE	0.0061	0.0061	0.1207	
TOLUENE	1.66E-04	1.66E-04	0.0045	
n-OCTANE	0.0015	0.0015	0.1011	
ETHYLBENZENE	6.13E-05	6.13E-05	0.0049	
m-XYLENE	2.24E-04	2.24E-04	0.0233	
o-XYLENE	7.81E-05	7.81E-05	0.0105	
n-NONANE	2.62E-04	2.62E-04	0.0569	
n-DECANE	3.70E-06	3.70E-06	0.0026	
n-UNDECANE	3.58E-05	3.58E-05	0.0926	
n-DODECANE	1.10E-05	1.10E-05	0.0926	
WATER	0.0191	0.0191	0.1035	

Storage Tank PTE Emissions Calculations

Unit Number: T3
Description: Produced Water Tank

Note: The data on this worksheet applies to each individual emissions unit identified above.

Throughput

70	bbl/turnover	Tank capacity	Harvest Four Corners, LLC
12	turnover/yr	Turnovers per year	Harvest Four Corners, LLC
840	bbl/yr	Annual liquid throughput	bbl/turnover x turnover/yr

Emission Rates

Pollutant	Emission Factor, lb/bbl	Uncontrolled, Emission Rate, tpy
VOC	0.262	1.10E-01
Benzene	0.007	2.94E-03
Ethylbenzene	0.0007	2.94E-04
n-Hexane	0.022	9.24E-03
Toluene	0.009	3.78E-03
Xylene	0.006	2.52E-03

VOC, Benzene, and n-Hexane emission factors are taken from the CDPHE PS Memo 09-02 (Oil & Gas Produced Water Tank Batteries - Regulatory Definitions & Permitting Guidance)
Ethylbenzene, toluene, and xylene emissions factors (Non-Texas) are taken from the TCEQ Project 2010-29 (Emission Factor Determination for Produced Water Storage Tanks) report
Uncontrolled Emission Rates (tpy) = lb/bbl x bbl/yr / 2,000 lb/ton

PS Memo 09-02

To: **Stationary Sources Program, Local Agencies, and Regulated Community**

From: **Chris Laplante and Roland C. Hea, Colorado Air Pollution Control Division**

Date: **February 8, 2010**

Subject: **Oil & Gas Produced Water Tank Batteries**
Regulatory Definitions and Permitting Guidance

This guidance document is intended to answer frequently asked questions concerning oil and gas industry produced water tank batteries. This document does not address any other equipment types that may be part of a common facility with a tank battery. Nothing in this guidance should be construed regarding Air Pollution Control Division (Division) permitting of evaporation ponds or water treatment facilities. Please consult with the Division for information regarding the permitting of evaporation ponds or water treatment facilities.

Revision History

October 1, 2009	Initial issuance.
February 8, 2010	First revision. This guidance document replaces the October 1, 2009 version. Revised language to clarify APEN fee structure, definition of modification, APEN submittals, and produced water exemption.

Topic **Page**

3. EMISSION FACTORS AND SITE SPECIFIC SAMPLING Q&A

3.1. ***What are the State approved default emission factors for produced water tanks?***

County	Produced Water Tank Default Emission Factors[1] (lb/bbl)[2]		
	VOC	Benzene	n-Hexane
Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, & Weld	0.262	0.007	0.022
Garfield, Mesa, Rio Blanco, & Moffat	0.178	0.004	0.010
Remainder of Colorado[3]	0.262	0.007	0.022

[1] Testing may be performed at any site to determine site-specific emissions factors. These default emission factors may be revised by the Division in the future, pending approved data and testing results.

[2] Units of lb/bbl means pounds of emissions per barrel of produced water throughput

[3] For counties not listed in this table, use the emissions factors listed as a conservative measure or perform testing to determine a site-specific emission factor

3.2. ***What type of emissions are included in the produced water tank state default emission factors?***

State default emission factors for produced water tanks include flash, working, and breathing losses.

3.3. ***Are there limits as to when produced water tank state default emission factors may be used?***

State default emission factors may be used at all oil and gas industry tank batteries. The Division intends to work with industry to refine emission factors and may develop separate emission factors for E&P and non-E&P sites.

3.4. ***When are site-specific emission factors required for tank batteries?***

Site-specific emission factors may be developed and used on a voluntary basis for any tank battery. The Division reserves the authority to require site-specific emission factors at any time. Site-specific emission factors may only be applied at the tank battery for which they were developed, unless otherwise approved by the Division.

3.5. ***How is a site-specific emission factor developed?***

A site-specific emission factor for tank batteries is developed by performing a Division approved stack test. A test protocol must be submitted and approved by the Division prior to performing the test. Once a test protocol has been approved by the Division, subsequent testing may be performed following the approved protocol without submittal to the Division.

The Division must be notified of the site specific testing at least 30-days prior to the actual test date.

Emission Factor Determination for Produced Water Storage Tanks

TCEQ Project 2010-29

Prepared for:
Texas Commission on Environmental Quality
Austin, Texas

Prepared by:
ENVIRON International Corporation
Novato, California

Date:
August 2010

ENVIRON Project Number:
06-17477T

Executive Summary

The overall purpose of this Study is to evaluate volatile organic compounds (VOC), speciated VOC and hazardous air pollutant (HAP) emissions from produced water and/or saltwater storage tanks servicing oil and gas wells and to develop appropriate VOC and HAP emission factors. The emission factors are to be used for emission inventory development purposes.

The primary source of information for this study was testing conducted by the Texas Commission on Environmental Quality (TCEQ) under Work Order 522-7-84005-FY10-25, *Upstream Oil & Gas Tank Measurements*, TCEQ Project 2010-39. As part of this referenced testing project, pressurized produced water samples were taken at seven different tank batteries located in Johnson, Wise and Tarrant Counties, Texas (all part of the Eastern Barnett Shale region) and analyzed for flash gas volume and composition. The sample collection and analysis conducted as part of TCEQ Project 2010-39 was done according to strict sampling and quality assurance procedures. In addition to TCEQ Project 2010-39 data, a thorough review of publically-available information sources identified a limited amount of data on produced water emissions. This was supplemented by data provided by two natural gas producers and one petroleum engineering services company. Other than TCEQ Project 2010-39 data, however, it could not be confirmed that any of the data had undergone a rigorous quality assurance process and therefore is considered secondary data, used to support conclusions drawn using the primary data but not used directly in deriving the produced water emission factors.

Emissions from produced water storage tanks consist of flash emissions, working losses and breathing losses. Flash emissions are determined using flash gas analysis. Working and breathing losses are estimated using EPA TANKS 4.09d software. Using this approach and the assumptions detailed within this report, it is determined that working and breathing losses associated with primary data source sites are very small compared to flash emissions and can be ignored without affecting the overall emission factor determination.

Table ES-1 presents the recommended emission factors for VOC and four HAPs – benzene, toluene, ethylbenzene and xylenes – derived from the primary data source sites. For comparative purposes, average emissions from Texas and non-Texas secondary sites are also presented in Table ES-1.

Table ES-1. Recommended Emission Factors and Comparative Data

Pollutant	Average Produced Water Emission Factor by Data Set (lb/bbl)		
	Recommended Emission Factor	Secondary Data – Texas	Secondary Data – Non-Texas
VOC	0.01	0.012	0.18
Benzene	0.0001	0.0012	0.004
Toluene	0.0003	0.0012	0.009
Ethylbenzene	0.000006	0.0001	0.0007
Xylenes	0.00006	0.0003	0.006

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Los Mestenios - T7 - Methanol
City:	Gavilan
State:	New Mexico
Company:	Harvest Four Corners, LLC
Type of Tank:	Horizontal Tank
Description:	500 Gallon Methanol Storage Tank

Tank Dimensions

Shell Length (ft):	6.00
Diameter (ft):	4.00
Volume (gallons):	500.00
Turnovers:	12.00
Net Throughput(gal/yr):	6,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Los Mestenios - T7 - Methanol - Horizontal Tank
Gavilan, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Methyl alcohol	All	67.36	53.93	80.79	59.23	1.8115	1.1881	2.6951	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Los Mestenios - T7 - Methanol - Horizontal Tank
Gavilan, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	36.5024
Vapor Space Volume (cu ft):	48.0243
Vapor Density (lb/cu ft):	0.0103
Vapor Space Expansion Factor:	0.2419
Vented Vapor Saturation Factor:	0.8389
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	48.0243
Tank Diameter (ft):	4.0000
Effective Diameter (ft):	5.5293
Vapor Space Outage (ft):	2.0000
Tank Shell Length (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0103
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.8115
Daily Avg. Liquid Surface Temp. (deg. R):	527.0322
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.9042
Tank Paint Solar Absorptance (Shell):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.2419
Daily Vapor Temperature Range (deg. R):	53.7176
Daily Vapor Pressure Range (psia):	1.5070
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.8115
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	1.1881
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	2.6951
Daily Avg. Liquid Surface Temp. (deg R):	527.0322
Daily Min. Liquid Surface Temp. (deg R):	513.6028
Daily Max. Liquid Surface Temp. (deg R):	540.4617
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8389
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	1.8115
Vapor Space Outage (ft):	2.0000
Working Losses (lb):	8.2917
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.8115
Annual Net Throughput (gal/yr.):	6,000.0000
Annual Turnovers:	12.0000
Turnover Factor:	1.0000

Tank Diameter (ft):	4.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	44.7941

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Los Mestenios - T7 - Methanol - Horizontal Tank
Gavilan, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Methyl alcohol	8.29	36.50	44.79

Green House Gas Emissions Data and Calculations

Sources	Facility Total Emissions				
	CO2, tpy	CH4, tpy	N2O, tpy	GHG, tpy	CO2e, tpy
Engine & Turbine Exhaust	11,586.25	2.19E-01	2.20E-02	11,586.49	11598.29
SSM Blowdowns	1.23	40.98	--	42.21	1025.65
Reciprocating Compressor Venting	1.54	51.19	--	52.73	1281.27
Centrifugal Compressor Venting	4.01	133.35	--	137.36	3337.80
Equipment Leaks	2.15E-01	7.15	--	7.36	178.95
Separators & Storage Tanks (Flash Emissions)	7.79E-02	13.58	--	13.65	339.48
Total	11,593.32	246.46	2.20E-02	11,839.81	17,761.44

Engine & Turbine Exhaust Emissions

Unit Numbers	Description	Emission Factors			Emission Rates		
		CO2, kg/MMBtu	CH4, kg/MMBtu	N2O, kg/MMBtu	CO2, tpy	CH4, tpy	N2O, tpy
1	Solar Saturn T1200	53.06	1.00E-03	1.00E-04	5,544.61	1.04E-01	1.04E-02
2	Waukesha L7042GL	53.06	1.00E-03	1.00E-04	6,010.45	1.13E-01	1.13E-02
3	Scania DS11	73.96	3.00E-03	6.00E-04	31.19	1.27E-03	2.53E-04
	Total				11,586.25	2.19E-01	2.20E-02

The emissions factors are taken from 40 CFR 98, Subpart C, Tables C-1 & C-2
Emission Rates (tpy) = kg/MMBtu x 2.2 lb/kg x MMBtu/yr / 2,000 lb/ton

Unit Numbers	Description	Fuel Types	Operating Times, hr/yr	LHV Design Heat Rates, MMBtu/hr	HHV	
					Design Heat Rates, MMBtu/hr	Fuel Usages, MMBtu/yr
1	Solar Saturn T1200	Nat. Gas	8,760	9.76	10.84	94,997
2	Waukesha L7042GL	Nat. Gas	8,760	10.58	11.76	102,979
3	Scania DS11	Diesel	500	0.69	0.77	383

The fuel types and operating times are provided by Harvest
The LHV design heat rates are taken from manufacturers data
HHV Design Heat Rates (MMBtu/hr) = LHV Design Heat Rates (MMBtu/hr) / 0.9 LHV/HHV
HHV Fuel Usages (MMBtu/yr) = HHV Design Heat Rates (MMBtu/hr) x hr/yr

SSM Blowdown Emissions

Unit Numbers	Description	Total Gas Losses, scf/yr	CO2 Emission Factors, lb/scf	CH4 Emission Factors, lb/scf	Emission Rates	
					CO2, tpy	CH4, tpy
SSM	SSM Blowdowns	2,462,200	0.0010	0.0333	1.23	40.98

The annual blowdown volumes are calculated from data provided by Harvest
The CO2 and CH4 emission factors are calculated from the facility extended gas analysis
Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

Green House Gas Emissions Data and Calculations

Reciprocating Compressor Venting Emissions

Unit Numbers	Description	Emission Rates	
		CO2, tpy	CH4, tpy
NA	Blowdown Valve Leakage	0.15	4.89
NA	Rod Packing Emissions	1.39	46.30
NA	Isolation Valve Leakage	0.00	0.00
	Total	1.54	51.19

Operating or standby mode - includes blowdown valve leakage through blowdown vent stack
Operating mode - includes rod packing emissions
Non-operating depressurized mode - includes isolation valve leakage through open blowdown vents (without blind flanges)
Rod packing gas emissions assume 4 cylinders per compressor
A combination of equations W-26 & W-36 (Subpart W) is used to calculate reciprocating compressor emissions
As the NMED requires CO2 & CH4 emissions rather than CO2e emissions, it is not necessary to include the global warming potential from equation W-36
CO2 Emission Rates (tpy) = # x scf/hr x hr/yr x (CO2 Mole Percent (%) / 100) x CO2 Density (kg/scf)
x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne
CH4 Emission Rates (tpy) = # x scf/hr x hr/yr x (CH4 Mole Percent (%) / 100) x CH4 Density (kg/scf)
x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne

Unit Numbers	Description	Number of Compressors #	Gas Emissions, scf/hr	Operating Times, hr/yr	CO2 Mole Percents, %	CH4 Mole Percents, %	CO2 Density, kg/scf	CH4 Density, kg/scf
NA	Blowdown Valve Leakage	1	33.5	8,760	0.86	78.73	0.0526	0.0192
NA	Rod Packing Emissions	1	317.2	8,760	0.86	78.73	0.0526	0.0192
NA	Isolation Valve Leakage	1	10.5	0	0.86	78.73	0.0526	0.0192

The number of compressors is provided by Harvest
Blowdown valve leakage (33.5 scf/hr) and rod packing emissions occur in operating mode
Blowdown valve leakage (10.5 scf/hr) occurs in standby pressurized mode
Emission factors are the three year rolling average (2012-2014) of all measurements in the Williams Field Services, LLC compressor fleet located at natural gas processing plants
The operating times (the average operating times for all station compressors combined) are provided by Harvest
The facility CO2 and CH4 contents are taken from the facility extended gas analysis
The CO2 & CH4 densities (kg/scf) are taken from Subpart W, Paragraph 98.233(v)

Centrifugal Compressor Venting Emissions

Unit Numbers	Description	Emission Rates	
		CO2, tpy	CH4, tpy
NA	Blowdown Valve Leakage	0.73	24.43
NA	Oil Degassing Vents	3.27	108.92
NA	Isolation Valve Leakage	0.00	0.00
	Total	4.01	133.35

Operating mode - includes blowdown valve leakage (wet and dry seal) and the oil degassing vents (wet seal)
Non-operating depressurized mode - includes isolation valve leakage (wet & dry seal) through open blowdown vents (without blind flanges)
A combination of equations W-22 & W-36 (Subpart W) is used to calculate centrifugal compressor emissions
As the NMED requires CO2 & CH4 emissions rather than CO2e emissions, it is not necessary to include the global warming potential from equation W-36
CO2 Emission Rates (tpy) = # x scf/hr x hr/yr x (CO2 Mole Percent (%) / 100) x CO2 Density (kg/scf)
x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne
CH4 Emission Rates (tpy) = # x scf/hr x hr/yr x (CH4 Mole Percent (%) / 100) x CH4 Density (kg/scf)
x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne

Green House Gas Emissions Data and Calculations

Unit Numbers	Description	Number of Compressors #	Gas Emissions, scf/hr	Operating Times, hr/yr	CO2 Mole Percents, %	CH4 Mole Percents, %	CO2 Density, kg/scf	CH4 Density, kg/scf
NA	Blowdown Valve Leakage	1	167.4	8,760	0.86	78.73	0.0526	0.0192
NA	Oil Degassing Vents	1	746.2	8,760	0.86	78.73	0.0526	0.0192
NA	Isolation Valve Leakage	1	10.8	0	0.86	78.73	0.0526	0.0192

The number of compressors is provided by Harvest
Emission factors are the three year rolling average (2012-2014) of all measurements in the Williams Field Services, LLC compressor fleet located at natural gas processing plants
The operating times (the average operating times for all station compressors combined) are provided by Harvest
The facility CO2 and CH4 contents are taken from the facility extended gas analysis
The CO2 & CH4 densities (kg/scf) are taken from Subpart W, Paragraph 98.233(v)

Equipment Leaks Emissions

Unit Numbers	Description	Emission Rates	
		CO2, tpy	CH4, tpy
NA	Valves	0.2	5.6
NA	Connectors	0.0	0.7
NA	Open-Ended Lines	0.0	0.4
NA	Pressure Relief Valves	0.0	0.5
	Total	0.2	7.1

A combination of equations W-31 & W-36 (Subpart W) is used to calculate uncombusted CO2 & CH4 emissions
As the NMED requires CO2 & CH4 emissions rather than CO2e emissions, it is not necessary to include the global warming potential from equation W-36
CO2 Emission Rate (tpy) = # x scf/hr/component x (CO2 Content (mole %) / 100) x hr/yr x CO2 Density (kg/scf) x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne
CH4 Emission Rate (tpy) = # x scf/hr/component x (CH4 Content (mole %) / 100) x hr/yr x CH4 Density (kg/scf) x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne

Unit Numbers	Description	Number of Components, #	Emission Factors, scf/hr /component	CO2 Contents, mole %	CH4 Contents, mole %	Operating Times, hr/yr	CO2 Density, kg/scf	CH4 Density, kg/scf
NA	Valves	315	0.121	0.86	78.73	8,760	0.0526	0.0192
NA	Connectors	263	0.017	0.86	78.73	8,760	0.0526	0.0192
NA	Open-Ended Lines	88	0.031	0.86	78.73	8,760	0.0526	0.0192
NA	Pressure Relief Valves	19	0.193	0.86	78.73	8,760	0.0526	0.0192

The number of sources are calculated based on the number of compressors and dehydrators at the station (see criteria pollutant and HAP equipment leaks calculations)
The emission factors are taken from Subpart W, Table W-1A (Western U.S. - Gas Service)
The facility CO2 and CH4 contents are taken from the facility extended gas analysis
The operating times are provided by Harvest (default is the entire year)
The CO2 & CH4 densities are taken from Subpart W, Paragraph 98.233(v)

Separators & Storage Tanks (Flash Emissions)

Unit Number	Description	Emission Rates	
		CO2, tpy	CH4, tpy
T1	Condensate Tank	7.79E-02	13.58
T2	Condensate Tank	--	--
	Total	7.79E-02	13.58

Emission rates calculated from VMGSym results

Green House Gas Emissions Data and Calculations

Gas Stream Composition

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Component Weights, lb/lb-mole	Weight Percent of Total, %	Emission Factors, lb/scf
Carbon Dioxide	0.8632	44.01	0.38	1.7805	0.0010
Hydrogen Sulfide	0.0000	34.07	0.00	0.0000	0.0000
Nitrogen	0.4462	28.01	0.12	0.5857	0.0003
Methane	78.7294	16.04	12.63	59.1848	0.0333
Ethane	10.7901	30.07	3.24	15.2064	0.0086
Propane	5.0734	44.09	2.24	10.4835	0.0059
IsoButane	0.8940	58.12	0.52	2.4352	0.0014
Normal Butane	1.5609	58.12	0.91	4.2518	0.0024
IsoPentane	0.5577	72.15	0.40	1.8858	0.0011
Normal Pentane	0.4298	72.15	0.31	1.4534	0.0008
Cyclopentane	0.0189	70.14	0.01	0.0621	0.0000
n-Hexane	0.1299	86.17	0.11	0.5246	0.0003
Cyclohexane	0.0389	84.16	0.03	0.1534	0.0001
Other Hexanes	0.2872	86.18	0.25	1.1600	0.0007
Heptanes	0.0720	100.20	0.07	0.3381	0.0002
Methylcyclohexane	0.0556	98.19	0.05	0.2559	0.0001
2,2,4-Trimethylpentane	0.0028	100.21	0.00	0.0132	0.0000
Benzene	0.0123	78.11	0.01	0.0450	0.0000
Toluene	0.0165	92.14	0.02	0.0713	0.0000
Ethylbenzene	0.0002	106.17	0.00	0.0010	0.0000
Xylenes	0.0024	106.17	0.00	0.0119	0.0000
C8+ heavies	0.0187	110.00	0.02	0.0964	0.0001
Total	100.0001		21.34	100.0000	0.0562
VOC			4.96	--	0.0131

Gas stream composition obtained from Los Mestenios extended gas analysis dated 05/06/2021
Component Weights (lb/lb-mole) = [Mole Percents (%) / 100] x Molecular Weights (lb/lb-mole)
Weight Percent of Total (%) = 100 x Component Weights (lb/lb-mole) / Total Component Weight (lb/lb-mole)
Emission Factors (lb/scf) = [Mole Percents (%) / 100] x Molecular Weights (lb/lb-mole) / 379.4 scf/lb-mole

Table A-1 to Subpart A of Part 98—Global Warming Potentials

GLOBAL WARMING POTENTIALS

[100-Year Time Horizon]

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
Carbon dioxide	124-38-9	CO_2	1
Methane	74-82-8	CH_4	[a]25
Nitrous oxide	10024-97-2	N_2O	[a]298
HFC-23	75-46-7	CHF_3	[a]14,800
HFC-32	75-10-5	CH_2F_2	[a]675
HFC-41	593-53-3	CH_3F	[a]92
HFC-125	354-33-6	C_2HF_5	[a]3,500
HFC-134	359-35-3	$C_2H_2F_4$	[a]1,100
HFC-134a	811-97-2	CH_2FCF_3	[a]1,430
HFC-143	430-66-0	$C_2H_3F_3$	[a]353
HFC-143a	420-46-2	$C_2H_3F_3$	[a]4,470
HFC-152	624-72-6	CH_2FCH_2F	53
HFC-152a	75-37-6	CH_3CHF_2	[a]124
HFC-161	353-36-6	CH_3CH_2F	12
HFC-227ea	431-89-0	C_3HF_7	[a]3,220
HFC-236cb	677-56-5	$CH_2FCF_2CF_3$	1,340
HFC-236ea	431-63-0	CHF_2CHFCF_3	1,370
HFC-236fa	690-39-1	$C_3H_2F_6$	[a]9,810
HFC-245ca	679-86-7	$C_3H_3F_5$	[a]693
HFC-245fa	460-73-1	$CHF_2CH_2CF_3$	1,030
HFC-365mfc	406-58-6	$CH_3CF_2CH_2CF_3$	794
HFC-43-10mee	138495-42-8	$CF_3CFHCFHCF_2CF_3$	[a]1,640
Sulfur hexafluoride	2551-62-4	SF_6	[a]22,800
Trifluoromethyl sulphur pentafluoride	373-80-8	SF_5CF_3	17,700
Nitrogen trifluoride	7783-54-2	NF_3	17,200
PFC-14 (Perfluoromethane)	75-73-0	CF_4	[a]7,390
PFC-116 (Perfluoroethane)	76-16-4	C_2F_6	[a]12,200
PFC-218 (Perfluoropropane)	76-19-7	C_3F_8	[a]8,830
Perfluorocyclopropane	931-91-9	$C\text{-}C_3F_6$	17,340
PFC-3-1-10 (Perfluorobutane)	355-25-9	C_4F_{10}	[a]8,860
PFC-318 (Perfluorocyclobutane)	115-25-3	$C\text{-}C_4F_8$	[a]10,300
PFC-4-1-12 (Perfluoropentane)	678-26-2	C_5F_{12}	[a]9,160
PFC-5-1-14 (Perfluorohexane, FC-72)	355-42-0	C_6F_{14}	[a]9,300
PFC-9-1-18	306-94-5	$C_{10}F_{18}$	7,500
HCFE-235da2 (Isoflurane)	26675-46-7	$CHF_2OCHClCF_3$	350
HFE-43-10pccc (H-Galden 1040x, HG-11)	E1730133	$CHF_2OCF_2OC_2F_4OCHF_2$	1,870

HFE-125	3822-68-2	CHF_2OCF_3	14,900
HFE-134 (HG-00)	1691-17-4	CHF_2OCHF_2	6,320
HFE-143a	421-14-7	CH_3OCF_3	756
HFE-227ea	2356-62-9	$CF_3CHFOCF_3$	1,540
HFE-236ca12 (HG-10)	78522-47-1	$CHF_2OCF_2OCHF_2$	2,800
HFE-236ea2 (Desflurane)	57041-67-5	$CHF_2OCHFCF_3$	989
HFE-236fa	20193-67-3	$CF_3CH_2OCF_3$	487
HFE-245cb2	22410-44-2	$CH_3OCF_2CF_3$	708
HFE-245fa1	84011-15-4	$CHF_2CH_2OCF_3$	286
HFE-245fa2	1885-48-9	$CHF_2OCH_2CF_3$	659
HFE-254cb2	425-88-7	$CH_3OCF_2CHF_2$	359
HFE-263fb2	460-43-5	$CF_3CH_2OCH_3$	11
HFE-329mcc2	134769-21-4	$CF_3CF_2OCF_2CHF_2$	919
HFE-338mcf2	156053-88-2	$CF_3CF_2OCH_2CF_3$	552
HFE-338pcc13 (HG-01)	188690-78-0	$CHF_2OCF_2CF_2OCHF_2$	1,500
HFE-347mcc3 (HFE-7000)	375-03-1	$CH_3OCF_2CF_2CF_3$	575
HFE-347mcf2	171182-95-9	$CF_3CF_2OCH_2CHF_2$	374
HFE-347pcf2	406-78-0	$CHF_2CF_2OCH_2CF_3$	580
HFE-356mec3	382-34-3	$CH_3OCF_2CHFCF_3$	101
HFE-356pcc3	160620-20-2	$CH_3OCF_2CF_2CHF_2$	110
HFE-356pcf2	50807-77-7	$CHF_2CH_2OCF_2CHF_2$	265
HFE-356pcf3	35042-99-0	$CHF_2OCH_2CF_2CHF_2$	502
HFE-365mcf3	378-16-5	$CF_3CF_2CH_2OCH_3$	11
HFE-374pc2	512-51-6	$CH_3CH_2OCF_2CHF_2$	557
HFE-449s1 (HFE-7100)	163702-07-6	$C_4F_9OCH_3$	297
Chemical blend	163702-08-7	$(CF_3)_2CFCF_2OCH_3$	
HFE-569sf2 (HFE-7200)	163702-05-4	$C_4F_9OC_2H_5$	59
Chemical blend	163702-06-5	$(CF_3)_2CFCF_2OC_2H_5$	
Sevoflurane (HFE-347mmz1)	28523-86-6	$CH_2FOCH(CF_3)_2$	345
HFE-356mm1	13171-18-1	$(CF_3)_2CHOCH_3$	27
HFE-338mmz1	26103-08-2	$CHF_2OCH(CF_3)_2$	380
(Octafluorotetramethy-lene) hydroxymethyl group	NA	$X\text{-}(CF_2)_4CH(OH)\text{-}X$	73
HFE-347mmy1	22052-84-2	$CH_3OCF(CF_3)_2$	343
Bis(trifluoromethyl)-methanol	920-66-1	$(CF_3)_2CHOH$	195
2,2,3,3,3-pentafluoropropanol	422-05-9	$CF_3CF_2CH_2OH$	42
PFPMIE (HT-70)	NA	$CF_3OCF(CF_3)CF_2OCF_2OCF_3$	10,300

[a]The GWP for this compound is different than the GWP in the version of Table A-1 to subpart A of part 98 published on October 30, 2009.

Table C-1 to Subpart C of Part 98—Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

DEFAULT CO_2 EMISSION FACTORS AND HIGH HEAT VALUES FOR VARIOUS TYPES OF FUEL

Fuel type	Default high heat value	Default CO_2 emission factor
Coal and coke	mmBtu/short ton	kg CO_2/mmBtu
Anthracite	25.09	103.69
Bituminous	24.93	93.28
Subbituminous	17.25	97.17
Lignite	14.21	97.72
Coal Coke	24.80	113.67
Mixed (Commercial sector)	21.39	94.27
Mixed (Industrial coking)	26.28	93.90
Mixed (Industrial sector)	22.35	94.67
Mixed (Electric Power sector)	19.73	95.52
Natural gas	mmBtu/scf	kg CO_2/mmBtu
(Weighted U.S. Average)	1.026×10^{-3}	53.06
Petroleum products	mmBtu/gallon	kg CO_2/mmBtu
Distillate Fuel Oil No. 1	0.139	73.25
Distillate Fuel Oil No. 2	0.138	73.96
Distillate Fuel Oil No. 4	0.146	75.04
Residual Fuel Oil No. 5	0.140	72.93
Residual Fuel Oil No. 6	0.150	75.10
Used Oil	0.138	74.00
Kerosene	0.135	75.20
Liquefied petroleum gases (LPG)[1]	0.092	61.71
Propane[1]	0.091	62.87
Propylene[2]	0.091	67.77
Ethane[1]	0.068	59.60
Ethanol	0.084	68.44
Ethylene[2]	0.058	65.96
Isobutane[1]	0.099	64.94
Isobutylene[1]	0.103	68.86
Butane[1]	0.103	64.77
Butylene[1]	0.105	68.72
Naphtha (<401 deg F)	0.125	68.02
Natural Gasoline	0.110	66.88
Other Oil (>401 deg F)	0.139	76.22
Pentanes Plus	0.110	70.02

Petrochemical Feedstocks	0.125	71.02
Petroleum Coke	0.143	102.41
Special Naphtha	0.125	72.34
Unfinished Oils	0.139	74.54
Heavy Gas Oils	0.148	74.92
Lubricants	0.144	74.27
Motor Gasoline	0.125	70.22
Aviation Gasoline	0.120	69.25
Kerosene-Type Jet Fuel	0.135	72.22
Asphalt and Road Oil	0.158	75.36
Crude Oil	0.138	74.54
Other fuels—solid	mmBtu/short ton	kg CO_2/mmBtu
Municipal Solid Waste	9.95[3]	90.7
Tires	28.00	85.97
Plastics	38.00	75.00
Petroleum Coke	30.00	102.41
Other fuels—gaseous	mmBtu/scf	kg CO_2/mmBtu
Blast Furnace Gas	0.092×10^{-3}	274.32
Coke Oven Gas	0.599×10^{-3}	46.85
Propane Gas	2.516×10^{-3}	61.46
Fuel Gas[4]	1.388×10^{-3}	59.00
Biomass fuels—solid	mmBtu/short ton	kg CO_2/mmBtu
Wood and Wood Residuals (dry basis)[5]	17.48	93.80
Agricultural Byproducts	8.25	118.17
Peat	8.00	111.84
Solid Byproducts	10.39	105.51
Biomass fuels—gaseous	mmBtu/scf	kg CO_2/mmBtu
Landfill Gas	0.485×10^{-3}	52.07
Other Biomass Gases	0.655×10^{-3}	52.07
Biomass Fuels—Liquid	mmBtu/gallon	kg CO_2/mmBtu
Ethanol	0.084	68.44
Biodiesel (100%)	0.128	73.84
Rendered Animal Fat	0.125	71.06
Vegetable Oil	0.120	81.55

[1]The HHV for components of LPG determined at 60 °F and saturation pressure with the exception of ethylene.

[2]Ethylene HHV determined at 41 °F (5 °C) and saturation pressure.

[3]Use of this default HHV is allowed only for: (a) Units that combust MSW, do not generate steam, and are allowed to use Tier 1; (b) units that derive no more than 10 percent of their annual heat input from MSW and/or tires; and (c) small batch incinerators that combust no more than 1,000 tons of MSW per year.

[4]Reporters subject to subpart X of this part that are complying with §98.243(d) or subpart Y of this part may only use the default HHV and the default CO_2 emission factor for fuel gas combustion under the conditions prescribed in §98.243(d)(2)(i) and (d)(2)(ii) and §98.252(a)(1) and (a)(2), respectively. Otherwise, reporters subject to subpart X or subpart Y shall use either Tier 3 (Equation C-5) or Tier 4.

[5]Use the following formula to calculate a wet basis HHV for use in Equation C-1: $HHV_w = ((100 - M)/100)*HHV_d$where HHV_w = wet basis HHV, M = moisture content (percent) and HHV_d = dry basis HHV from Table C-1.

[78 FR 71950, Nov. 29, 2013]

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Table C-2 to Subpart C of Part 98—Default CH_4 and N_2O Emission Factors for Various Types of Fuel

Fuel type	Default CH_4 emission factor (kg CH_4/mmBtu)	Default N_2O emission factor (kg N_2O/mmBtu)
Coal and Coke (All fuel types in Table C-1)	1.1×10^{-02}	1.6×10^{-03}
Natural Gas	1.0×10^{-03}	1.0×10^{-04}
Petroleum (All fuel types in Table C-1)	3.0×10^{-03}	6.0×10^{-04}
Fuel Gas	3.0×10^{-03}	6.0×10^{-04}
Municipal Solid Waste	3.2×10^{-02}	4.2×10^{-03}
Tires	3.2×10^{-02}	4.2×10^{-03}
Blast Furnace Gas	2.2×10^{-05}	1.0×10^{-04}
Coke Oven Gas	4.8×10^{-04}	1.0×10^{-04}
Biomass Fuels—Solid (All fuel types in Table C-1, except wood and wood residuals)	3.2×10^{-02}	4.2×10^{-03}
Wood and wood residuals	7.2×10^{-03}	3.6×10^{-03}
Biomass Fuels—Gaseous (All fuel types in Table C-1)	3.2×10^{-03}	6.3×10^{-04}
Biomass Fuels—Liquid (All fuel types in Table C-1)	1.1×10^{-03}	1.1×10^{-04}

Note: Those employing this table are assumed to fall under the IPCC definitions of the “Energy Industry” or “Manufacturing Industries and Construction”. In all fuels except for coal the values for these two categories are identical. For coal combustion, those who fall within the IPCC “Energy Industry” category may employ a value of 1g of CH_4/mmBtu.

Table W-1A of Subpart W of Part 98—Default Whole Gas Emission Factors for Onshore Petroleum and Natural Gas Production

Onshore petroleum and natural gas production	Emission factor (scf/hour/ component)
Eastern U.S.	
Population Emission Factors—All Components, Gas Service[1]	
Valve	0.027
Connector	0.003
Open-ended Line	0.061
Pressure Relief Valve	0.040
Low Continuous Bleed Pneumatic Device Vents[2]	1.39
High Continuous Bleed Pneumatic Device Vents[2]	37.3
Intermittent Bleed Pneumatic Device Vents[2]	13.5
Pneumatic Pumps[3]	13.3
Population Emission Factors—All Components, Light Crude Service[4]	
Valve	0.05
Flange	0.003
Connector	0.007
Open-ended Line	0.05
Pump	0.01
Other[5]	0.30
Population Emission Factors—All Components, Heavy Crude Service[6]	
Valve	0.0005
Flange	0.0009
Connector (other)	0.0003
Open-ended Line	0.006
Other[5]	0.003
Western U.S.	
Population Emission Factors—All Components, Gas Service[1]	
Valve	0.121
Connector	0.017
Open-ended Line	0.031
Pressure Relief Valve	0.193
Low Continuous Bleed Pneumatic Device Vents[2]	1.39
High Continuous Bleed Pneumatic Device Vents[2]	37.3
Intermittent Bleed Pneumatic Device Vents[2]	13.5
Pneumatic Pumps[3]	13.3
Population Emission Factors—All Components, Light Crude Service[4]	
Valve	0.05
Flange	0.003

Connector (other)	0.007
Open-ended Line	0.05
Pump	0.01
Other[5]	0.30
Population Emission Factors—All Components, Heavy Crude Service[6]	
Valve	0.0005
Flange	0.0009
Connector (other)	0.0003
Open-ended Line	0.006
Other[5]	0.003

[1]For multi-phase flow that includes gas, use the gas service emissions factors.

[2]Emission Factor is in units of “scf/hour/device.”

[3]Emission Factor is in units of “scf/hour/pump.”

[4]Hydrocarbon liquids greater than or equal to 20°API are considered “light crude.”

[5]“Others” category includes instruments, loading arms, pressure relief valves, stuffing boxes, compressor seals, dump lever arms, and vents.

[6]Hydrocarbon liquids less than 20°API are considered “heavy crude.”

Facility Total Actual Emissions (Criteria Pollutants)

Company: **Harvest Four Corners, LLC**
Facility: **Los Mestenios Compressor Station**
Date: **February 2022**

Unit Number	Description	NOX,		CO,		VOC,		SOX,		TSP,		PM10,		PM2.5,	
		pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy
1	Solar Saturn T1200	4.41	19.30	2.60	11.40	9.13E-02	4.00E-01	3.69E-02	1.61E-01	7.15E-02	3.13E-01	7.15E-02	3.13E-01	7.15E-02	3.13E-01
2	Waukesha 7042GL	4.38	19.20	7.74	33.92	2.92	12.80	5.77E-03	2.53E-02	9.81E-02	4.30E-01	9.81E-02	4.30E-01	9.81E-02	4.30E-01
3	Scania DS11	3.04	1.85E-01	6.56E-01	3.99E-02	2.48E-01	1.51E-02	2.00E-01	1.22E-02	2.14E-01	1.30E-02	2.14E-01	1.30E-02	2.14E-01	1.30E-02
4	Fuel Gas Heater	3.33E-02	1.46E-01	2.80E-02	1.23E-01	1.83E-03	8.03E-03	2.00E-04	8.76E-04	2.53E-03	1.11E-02	2.53E-03	1.11E-02	2.53E-03	1.11E-02
5	Tank Heater	3.33E-02	1.46E-01	2.80E-02	1.23E-01	1.83E-03	8.03E-03	2.00E-04	8.76E-04	2.53E-03	1.11E-02	2.53E-03	1.11E-02	2.53E-03	1.11E-02
SSM	SSM	-	-	-	-	-	4.21	-	-	-	-	-	-	-	-
F1	Leaks	-	-	-	-	1.10	4.81	-	-	-	-	-	-	-	-
L1	Truck Loading (Condensate)	-	-	-	-	-	1.85E-01	-	-	-	-	-	-	-	-
L2	Truck Loading (Produced H2O)	-	-	-	-	-	2.16E-04	-	-	-	-	-	-	-	-
T1	Condensate Tank - 480 bbl	-	-	-	-	-	8.69	-	-	-	-	-	-	-	-
T2	Condensate Tank - 400 bbl	-	-	-	-	-	1.47	-	-	-	-	-	-	-	-
T3	Produced H2O Tank - 70 bbl	-	-	-	-	-	1.72E-02	-	-	-	-	-	-	-	-
T4	Lube Oil Tank - 500 gal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5	Used Oil Tank - 500 gal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T6	Ambitrol Tank - 350 gal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T7	Methanol Tank - 500 gal	-	-	-	-	-	2.24E-02	-	-	-	-	-	-	-	-
	Total	11.90	38.98	11.06	45.61	4.36	32.63	2.43E-01	2.01E-01	3.89E-01	7.78E-01	3.89E-01	7.78E-01	3.89E-01	7.78E-01

Residual oil #6 was used as an estimate for lubrication oil. As the vapor pressure of residual oil #6 is less than 0.2 psia, emissioins from the tank containing lubrication oil are assumed to be insignificant.

Ambitrol is an inhibited ethylene or propylene glycol coolant containing ethylene or propylene glycol, water and less than 5% dipotassium hydrogen phosphate. As the vapor pressures of ethylene glycol and propylene glycol are less than 0.2 psia, emissions from the tank containing Ambitrol are assumed to be insignificant.

Turbine Exhaust Actual Emissions Calculations

Unit Number: 1
Description: Solar Saturn T1200

Horsepower Calculations

6,715	ft above MSL	Elevation	
1,200	hp	Nameplate hp	Mfg. data
1,136	hp	Site-rated hp	Mfg. data

Fuel Consumption

10.84	MMBtu/hr	Hourly fuel consumption	Btu/hp-hr x NMAQB site-rated hp / 1,000,000
12,044	scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
8,760	hr/yr	Annual operating time	Harvest Four Corners, LLC
94,958	MMBtu/yr	Annual fuel consumption	MMBtu/hr x hr/yr
105.51	MMscf/yr	Annual fuel consumption	scf/hr x hr/yr / 1,000,000
900	Btu/scf	Field gas heating value	Nominal heat content

Steady-State Emission Rates

Pollutants	Uncontrolled Emission Rates, pph	tpy
NOX	4.41	19.30
CO	2.60	11.40
VOC	9.13E-02	4.00E-01

Emissions brought forward from Part 71 TV permit R6NM-04-10-M1

Pollutants	Emission Factors, lb/MMBtu	Uncontrolled Emission Rates, pph	tpy
SO2	3.40E-03	3.69E-02	1.61E-01
TSP	6.60E-03	7.15E-02	3.13E-01
PM10	6.60E-03	7.15E-02	3.13E-01
PM2.5	6.60E-03	7.15E-02	3.13E-01

Emission factors taken from AP-42, Table 3.1-2a
Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Notes :

There were no downtimes in 2021.

Engine Exhaust Actual Emissions Calculations

Unit Number: 2
Description: Waukesha L7042GL
Type: Four Stroke Lean Burn (Turbocharged)

Horsepower Calculations

6,715	ft above MSL	Elevation	
1,480	hp	Nameplate hp	Mfg. data
1,326	hp	Mfg. Site-rated hp	Mfg. product bulletin Power Derate, S8154-6, April 2001 (loss of 2% for every 1,000 ft over 1,500 ft)

Engine Specifications

1200	rpm	Engine rpm	Mfg. data
7040	cu in	Engine displacement	Mfg. data
124.28	psi	BMEP	792,000 x Mfg. Site-rated hp / (rpm * cu in)

Fuel Consumption

7408	Btu/hp-hr	Brake specific fuel consumption	Mfg. data
9.82	MMBtu/hr	Hourly fuel consumption	Btu/hp-hr x Mfg. site-rated hp / 1,000,000
900	Btu/scf	Field gas heating value	Nominal heat content
10,912	scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
8,760	hr/yr	Annual operating time	Harvest Four Corners, LLC
86,027	MMBtu/yr	Annual fuel consumption	MMBtu/hr x hr/yr
95.59	MMscf/yr	Annual fuel consumption	scf/hr x hr/yr / 1,000,000

Steady-State Emission Rates

Pollutants	Emission Factors, g/hp-hr	Uncontrolled Emission Rates, pph	tpy
NOX	1.50	4.38	19.20
CO	2.65	7.74	33.92
VOC	1.00	2.92	12.80

Emission factors taken from Waukesha Bulletin 7005 0107
Uncontrolled Emission Rates (pph) = g/hp-hr x hp / 453.59 g/lb
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Pollutants	Emission Factors, lb/MMBtu	Uncontrolled Emission Rates, pph	tpy
SO2	5.88E-04	5.77E-03	2.53E-02
TSP	9.99E-03	9.81E-02	4.30E-01
PM10	9.99E-03	9.81E-02	4.30E-01
PM2.5	9.99E-03	9.81E-02	4.30E-01

Emission factors taken from AP-42, Table 3.2-2
Particulate factors include both filterable and condensible emissions
Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Notes:

Since the engine is new and there are no operating hours for 2021, it is assumed the engine will operate 8,760 hours per year.

Engine Exhaust Emissions Calculations

Unit Number: 3
Description: Scania DS11 Diesel Generator (Emergency)

Horsepower

250	hp	Nameplate hp	Mfg. data

The data sheet shows the DS11 has a horsepower rating of 250+. Since the assocaited alternator is rated at 130 kW, the assumption of a site rating at 250 hp should be conservative.

Fuel Consumption

0.69	MMBtu/hr	Hourly fuel consumption	Mfg. data
138,000	Btu/gal	Field gas heating value	Nominal heat content
5.00	gal/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/gal
121.8	hr/yr	Annual operating time	Harvest Four Corners, LLC
609	gal/yr	Hourly fuel consumption	gal/hr x hr/yr
84	MMBtu/yr	Annual fuel consumption	MMBtu/hr x hr/yr

Steady-State Emission Rates

Pollutants	Emission Factors, lb/MMBtu	Uncontrolled Emission Rates, pph	tpy
NO2	4.41	3.04	1.85E-01
CO	9.50E-01	6.56E-01	3.99E-02
VOC	3.60E-01	2.48E-01	1.51E-02
SO2	2.90E-01	2.00E-01	1.22E-02
TSP	3.10E-01	2.14E-01	1.30E-02
PM10	3.10E-01	2.14E-01	1.30E-02
PM2.5	3.10E-01	2.14E-01	1.30E-02
Acetaldehyde	7.67E-04	5.29E-04	3.22E-05
Benzene	9.33E-04	6.44E-04	3.92E-05
Formaldehyde	1.18E-03	8.14E-04	4.96E-05
Naphthalene	8.48E-05	5.85E-05	3.56E-06
Toluene	4.09E-04	2.82E-04	1.72E-05
Xylene	2.85E-04	1.97E-04	1.20E-05

Emission factors taken from AP-42, Tables 3.3-1 & 3.3-2
Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Heater Exhaust Actual Emissions Calculations

Unit Number: 4 & 5
Description: Fuel Gas Heater and Tank Heater

Note: The data on this worksheet applies to each individual emissions unit identified above.

Fuel Consumption

0.30	MMBtu/hr	Capacity	Mfg. data
333	scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
8,760	hr/yr	Annual operating time	Harvest Four Corners, LLC
2,628	MMBtu/yr	Annual fuel consumption	MMBtu/hr x hr/yr
2.92	MMscf/yr	Annual fuel consumption	scf/hr x hr/yr / 1,000,000
900	Btu/scf	Field gas heating value	Nominal heat content

Steady-State Emission Rates

Pollutants	Emission Factors, lb/MMscf	Uncontrolled Emission Rates, pph	tpy
NOX	100	3.33E-02	1.46E-01
CO	84	2.80E-02	1.23E-01
VOC	5.5	1.83E-03	8.03E-03
SO2	0.6	2.00E-04	8.76E-04
TSP	7.60	2.53E-03	1.11E-02
PM10	7.60	2.53E-03	1.11E-02
PM2.5	7.60	2.53E-03	1.11E-02
Lead	5.00E-04	1.67E-07	7.30E-07

Emission factors taken from AP-42, Tables 1.4-1 & 1.4-2
Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Notes:

It is conservatively estimated the heaters will each operate 8,760 hours per year.

Turbine & Compressor Blowdown Actual Emissions Calculations

Unit Number: SSM
Description: Turbine, Compressor & Piping Associated With Station

Throughput

1	# of units	Number of units	Harvest Four Corners, LLC
0	events/yr/unit	Blowdowns per year per unit	Harvest Four Corners, LLC
5,780	scf/event	Gas loss per blowdown (compressor)	Harvest Four Corners, LLC
12,400	scf/event	Gas loss per blowdown (turbine)	Harvest Four Corners, LLC
0	scf/yr	Annual gas loss	# of units x events/yr/unit x [scf/event (compressor) + scf/event (turbine)]

Emission Rates

Pollutants	Emission Factors, lb/scf	Uncontrolled, Emission Rates, tpy
VOC	1.307E-02	0.00

Emission factors calculated from gas composition (see table below)
Uncontrolled Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

Gas Composition

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Carbon dioxide	0.8632	44.01	1.002E-03
Hydrogen sulfide	0.0000	34.07	0.000E+00
Nitrogen	0.4462	28.01	3.295E-04
Methane	78.7294	16.04	3.329E-02
Ethane	10.7901	30.07	8.554E-03
Propane	5.0734	44.09	5.897E-03
Isobutane	0.8940	58.12	1.370E-03
n-Butane	1.5609	58.12	2.392E-03
Isopentane	0.5577	72.15	1.061E-03
n-Pentane	0.4298	72.15	8.176E-04
Cyclopentane	0.0189	70.14	3.495E-05
n-Hexane	0.1299	86.17	2.951E-04
Cyclohexane	0.0389	84.16	8.631E-05
Other hexanes	0.2872	86.18	6.525E-04
Heptanes	0.0720	100.20	1.902E-04
Methylcyclohexane	0.0556	98.19	1.439E-04
Isooctane	0.0028	100.21	7.398E-06
Benzene	0.0123	78.11	2.533E-05
Toluene	0.0165	92.14	4.008E-05
Ethylbenzene	0.0002	106.17	5.598E-07
Xylenes	0.0024	106.17	6.718E-06
C8+ Heavies	0.0187	110.00	5.423E-05
Total	100.0001		
Total VOC			1.307E-02

Gas stream composition obtained from Los Mestenios extended gas analysis dated 05/06/2021
Emission Factors (lb/scf) = (% / 100) x lb/lb-mole / 379.3 scf/lb-mole

Notes:

There were no turbine startups and shutdowns in 2021.

Compressor Blowdown Actual Emissions Calculations

Unit Number: SSM
Description: RICE Compressor & Piping Associated With Station

Throughput

1	# of units	Number of units	Harvest Four Corners, LLC
100	events/yr/unit	Blowdowns per year per unit	Harvest Four Corners, LLC
6,442	scf/event	Gas loss per blowdown	Harvest Four Corners, LLC
644,200	scf/yr	Annual gas loss	# of units x events/yr/unit x scf/event

Emission Rates

Pollutants	Emission Factors, lb/scf	Uncontrolled, Emission Rates, tpy
VOC	1.307E-02	4.21

Emission factors calculated from gas composition (see table below)
Uncontrolled Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

Gas Composition

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Carbon dioxide	0.8632	44.01	1.002E-03
Hydrogen sulfide	0.0000	34.07	0.000E+00
Nitrogen	0.4462	28.01	3.295E-04
Methane	78.7294	16.04	3.329E-02
Ethane	10.7901	30.07	8.554E-03
Propane	5.0734	44.09	5.897E-03
Isobutane	0.8940	58.12	1.370E-03
n-Butane	1.5609	58.12	2.392E-03
Isopentane	0.5577	72.15	1.061E-03
n-Pentane	0.4298	72.15	8.176E-04
Cyclopentane	0.0189	70.14	3.495E-05
n-Hexane	0.1299	86.17	2.951E-04
Cyclohexane	0.0389	84.16	8.631E-05
Other hexanes	0.2872	86.18	6.525E-04
Heptanes	0.0720	100.20	1.902E-04
Methylcyclohexane	0.0556	98.19	1.439E-04
Isooctane	0.0028	100.21	7.398E-06
Benzene	0.0123	78.11	2.533E-05
Toluene	0.0165	92.14	4.008E-05
Ethylbenzene	0.0002	106.17	5.598E-07
Xylenes	0.0024	106.17	6.718E-06
C8+ Heavies	0.0187	110.00	5.423E-05
Total	100.0001		
Total VOC			1.307E-02

Gas stream composition obtained from Los Mestenios extended gas analysis dated 05/06/2021
Emission Factors (lb/scf) = (% / 100) x lb/lb-mole / 379.3 scf/lb-mole

Notes:

Since the engine is new and there are no startups and shutdowns for 2021, it is assumed there will be 100 events during the year.

Equipment Leaks Actual Emissions Calculations

Unit Number: F1
Description: Valves, Connectors, Seals & Open-Ended Lines

Steady-State Emission Rates

Equipment	Number of Components, # of sources	Emission Factors, kg/hr/source	Emission Factors, lb/hr/source	Uncontrolled TOC Emission Rates, pph	tpy
Valves	315	0.0045	0.0099	3.12	13.66
Connectors	263	0.0002	0.0004	0.12	0.51
Pump Seals	0	0.0024	0.0053	0.00	0.00
Compressor Seals	32	0.0088	0.0194	0.62	2.71
Pressure Relief Valves	19	0.0088	0.0194	0.37	1.61
Open-Ended Lines	88	0.0020	0.0044	0.39	1.70
Total				**4.61**	**20.19**

Number of components based on the numbers of compressors and dehydrators at the station (see next page)
Emission factors taken from the EPA "1995 Protocol for Equipment Leak Emission Estimates"
Emission factors (lb/hr/source) = Emission factors (kg/hr/source) x 2.2 lb/kg
Uncontrolled TOC Emission Rates (pph) = lb/hr/source x # of sources
Uncontrolled TOC Emission Rates (tpy) = Uncontrolled TOC Emission Rates (pph) x 8,760 hr/yr / 2,000 lb/ton

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Component Weights, lb/lb-mole	Weight Percent of TOC, %	Uncontrolled Emission Rates, pph	tpy
Carbon dioxide	0.8632	44.010				
Hydrogen sulfide	0.0000	34.070				
Nitrogen	0.4462	28.013				
Methane	78.7294	16.043	1263.056	60.619		
Ethane	10.7901	30.070	324.458	15.572		
Propane	5.0734	44.097	223.722	10.737	4.95E-01	2.17E+00
Isobutane	0.8940	58.123	51.962	2.494	1.15E-01	5.03E-01
n-Butane	1.5609	58.123	90.724	4.354	2.01E-01	8.79E-01
Isopentane	0.5577	72.150	40.238	1.931	8.90E-02	3.90E-01
n-Pentane	0.4298	72.150	31.010	1.488	6.86E-02	3.00E-01
Cyclopentane	0.0189	70.134	1.326	0.064	2.93E-03	1.28E-02
n-Hexane	0.1299	86.177	11.194	0.537	2.48E-02	1.08E-01
Cyclohexane	0.0389	84.161	3.274	0.157	7.24E-03	3.17E-02
Other hexanes	0.2872	86.177	24.750	1.188	5.47E-02	2.40E-01
Heptanes	0.0720	100.204	7.215	0.346	1.60E-02	6.99E-02
Methylcyclohexane	0.0556	98.188	5.459	0.262	1.21E-02	5.29E-02
Isooctane	0.0028	114.231	0.320	0.015	7.07E-04	3.10E-03
Benzene	0.0123	78.114	0.961	0.046	2.13E-03	9.31E-03
Toluene	0.0165	92.141	1.520	0.073	3.36E-03	1.47E-02
Ethylbenzene	0.0002	106.167	0.021	0.001	4.70E-05	2.06E-04
Xylenes	0.0024	106.167	0.255	0.012	5.64E-04	2.47E-03
C8+ Heavies	0.0187	114.231	2.136	0.103	4.72E-03	2.07E-02
Total	100.0001		2083.601			
Total VOC				23.809	1.10	4.81

Gas stream composition obtained from Los Mestenios extended gas analysis dated 05/06/2021
Component Weights (lb/lb-mole) = (% / 100) * Molecular Weights (lb/lb-mole)
Weight Percent of TOC (%) = 100 x Component Weights (lb/lb-mole) / Total Component Weight (lb/lb-mole)
Uncontrolled Emission Rates (pph) = Total Uncontrolled TOC Emission Rate (pph) x (% / 100)
Uncontrolled Emission Rates (tpy) = Total Uncontrolled TOC Emission Rate (tpy) x (% / 100)

Equipment Leaks Actual Emissions Calculations

Unit Number: F1
Description: Valves, Connectors, Seals & Lines

Number of Compression Units at the Facility: 2
Number of Dehydrators at the Facility: 0

Process Equipment Description	Equipment Count						Instrument Count		
	Valves	Connectors	Pump Seals	Compressor Seals	Pressure Relief Valves	Open-end	Flow	Level	Pressure
Station inlet, meter run to pulsation dampener	17	14	0	0	1	13	3	0	3
Pulsation dampener	12	8	0	0	0	2	0	4	1
Compressor suction header	7	4	0	0	0	3	0	0	1
Suction header feed to instrument gas header	3	1	0	0	0	1	0	0	0
Compressor discharge header and bypass to station discharge	6	5	0	0	0	3	0	1	1
Compressor discharge header and suction header bypass lines	4	2	0	0	0	2	0	0	1
Fuel gas header	2	2	0	0	1	2	0	0	1
Instrument gas header	2	2	0	0	1	2	0	0	0
Station discharge header	9	5	0	0	1	6	0	0	2
Fuel gas recovery header	2	2	0	0	1	2	0	0	0
Fuel gas feed and filter loop	15	9	0	0	0	1	0	4	1
Instrument gas feed and filter loop	9	11	0	0	0	3	0	0	0
Produced water storage tank	1	0	0	0	0	1	0	1	0
ESD panel	12	0	0	0	0	0	0	0	0
Starting gas header	6	2	0	0	1	3	0	0	0
Hot gas header	2	2	0	0	0	2	0	0	0
Volume bottle lop	12	4	0	24	1	2	0	0	1
Components from Compressors	88	118	0	8	12	22	0	8	18
Components from dehydrators	0	0	0	0	0	0	0	0	0
Total	209	191	0	32	19	70	3	18	30
Adjusted Total	315	263	0	32	19	88			

The following additions are included in the Adjusted Total:

1 valve is added for each open end line
2 connectors are added for each flow meter
2 valves, 2 connectors and 1 open end line are added for each level gauge
1 connector is added for each pressure gauge

The component count is based on an evaluation of the Sim Mesa Compressor Station (two stage compression)

Truck Loading (Condensate) Actual Emissions Calculations

Unit Number: L1
Description: Truck Loading

Emission Factor

0.6		Saturation factor, S	AP-42, Table 5.2-1 (submerged loading & dedicated service)
2.28	psia	True vapor pressure of liquid, P	TANKS 4.0 output file
78.1	lb/lb-mole	Molecular weight of vapors, M	TANKS 4.0 output file
65	°F	Temperature of liquid	TANKS 4.0 output file
524.6	°R	Temperature of liquid, T	°F + 459.67
2.54	lb/10^3 gal	Emission factor, L	AP-42, Section 5.2, Equation 1 L =12.46 (SPM/T)

Production Rate

145.60	10^3 gal/yr	Maximum annual production rate (= 21,000 bbl/yr, which is approx. max historical throughput plus 10%)	Harvest Four Corners, LLC

Steady-State Emission Rates

Pollutant	Emission Rates, tpy
VOC	1.85E-01

Emission Rate (tpy) = lb/10^3 gal x 10^3 gal/yr / 2,000 lb/ton

Truck Loading (Produced Water) Actual Emissions Calculations

Unit Number: L2
Description: Truck Loading

Emission Factor

0.6		Saturation factor, S	AP-42, Table 5.2-1 (submerged loading & dedicated service)
0.3045	psia (average)	True vapor pressure of liquid, P	Estimated using Antoine's Equation (see calculations below)
18.02	lb/lb-mole	Molecular weight of vapors, M	TANKS 4.0 Database
65	°F (average)	Temperature of liquid	Estimated (see calculations below)
524.67	°R (average)	Temperature of liquid, T	°F + 459.67
0.08	lb/10^3 gal (average)	Emission factor, L	AP-42, Section 5.2, $L = 12.46 \frac{SPM}{T}$

Production Rate

5.53	10^3 gal/yr	Maximum annual production rate	Harvest Four Corners, LLC

Steady-State Emission Rates

Pollutant	Emission Rates, tpy
VOC	2.16E-04

Uncontrolled Emission Rate (tpy) = lb/10^3 gal x 10^3 gal/yr / 2,000 lb/ton

Vapor Pressure of Produced Water:

It is estimated that the true vapor pressure of produced water is approximately equal to the true vapor pressure of pure water. An estimate of the true vapor pressure for water is calculated using Antoine's equation (see AP-42, Section 7.1, Equation 1-25).

Average:

Temperature = 65 °F

log P = A - (B / (C + T))

A = 8.07131
B = 1730.63
C = 233.426
T = 18.33 °C
P = mmHg

P = 10^(A - (B / (C + T))

P = 15.75 mmHg
P = 0.3045 psi

Note: 760 mmHg = 14.7 psia

Storage Tank Actual Emissions Data and Calculations

Unit Number: T1 & T2
Description: Condensate Storage Tanks

Emission Rates

Source/Pollutants	Working/Breathing Losses, ppy	Working/Breathing Losses, tpy	Flash Losses, tpy	Uncontrolled Emission Rates, tpy
T1				
VOC	3,361.70	1.68	7.01	8.69
T2				
VOC	2,937.44	1.47	--	1.47

Working/breathing losses taken from TANKS 4.0 results
Flash VOC emissions taken from VMGSim results
Flash HAP emissions calculated from the flash VOC emissions and the weight % HAP (calculated in the table below)
Unit T2 does not have flash emissions because it is an overflow tank for Unit T1. All flashing occurs in Unit T1.

Condensate Composition (To Determine Working/Breathing Losses)

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Component Weights, lb/lb-mole	Weight Percent, %
Carbon dioxide	0.0016	44.010		
Hydrogen sulfide	0.0000	34.070		
Nitrogen	0.0016	28.013		
Water	10.3467	18.015	186.3954	1.9609
Methane	0.2398	16.043	3.8476	0.0405
Ethane	0.2647	30.070	7.9592	0.0837
Propane	0.3284	44.097	14.4797	0.1523
Isobutane	1.3530	58.123	78.6407	0.8273
n-Butane	4.0043	58.123	232.7417	2.4485
Isopentane	5.2914	72.150	381.7734	4.0163
n-Pentane	4.7618	72.150	343.5631	3.6143
Cyclopentane	0.0479	70.134	3.3588	0.0353
n-Hexane	7.2009	86.177	620.5560	6.5283
Cyclohexane	4.2312	84.161	356.1035	3.7463
Other hexanes	0.0000	86.177	0.0000	0.0000
Heptanes	12.0651	100.204	1208.9690	12.7185
Methylcyclohexane	9.4637	98.188	929.2256	9.7756
Isooctane	0.3125	114.231	35.7007	0.3756
Benzene	1.1780	78.114	92.0162	0.9680
Toluene	0.4530	92.141	41.7421	0.4391
Ethylbenzene	0.4864	106.167	51.6357	0.5432
Xylenes	3.3752	106.167	358.3340	3.7697
n-Octane	10.1150	114.232	1155.4546	12.1555
n-Nonane	5.6876	128.259	729.4821	7.6743
n-Decane	18.7903	142.286	2673.5942	28.1266
Total	100.0000		9505.5736	100.0000

Gas stream composition obtained from VGMSym output
Component Weights (lb/lb-mole) = (% / 100) * Molecular Weights (lb/lb-mole)
Weight Percent of TOC (%) = 100 x Component Weights (lb/lb-mole) / Total Component Weight (lb/lb-mole)
In TANKS 4, the methane, ethane, and propane percentages are included with isobutane and n-butane (an even distribution)

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Los Mestenios - T1 - Condensate ACT
City:	Gavilan
State:	New Mexico
Company:	Harvest Four Corners, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	490 Barrel Condensate Storage Tank

Tank Dimensions

Shell Height (ft):	16.00
Diameter (ft):	14.75
Liquid Height (ft) :	15.00
Avg. Liquid Height (ft):	7.50
Volume (gallons):	19,173.00
Turnovers:	7.60
Net Throughput(gal/yr):	145,596.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	0.00
Radius (ft) (Dome Roof)	14.75

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Los Mestenios - T1 - Condensate ACT - Vertical Fixed Roof Tank
Gavilan, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate	All	67.36	53.93	80.79	59.23	3.4523	2.6161	4.3471	66.3334			95.42	
2,2,4-Trimethylpentane (isooctane)						0.7338	0.4989	1.0546	114.2300	0.0038	0.0011	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4274	0.9846	2.0237	78.1100	0.0097	0.0058	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Butane (-n)						29.9357	23.3576	34.6684	58.1230	0.0259	0.3227	58.12	Option 1: VP60 = 26.1 VP70 = 31.31
Cyclohexane						1.4738	1.0254	2.0729	84.1600	0.0375	0.0230	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Cyclopentane						4.9596	3.6370	6.6394	70.1300	0.0004	0.0007	70.13	Option 1: VP60 = 4.177 VP70 = 5.24
Decane (-n)						0.0395	0.0291	0.0536	142.2900	0.2813	0.0046	142.29	Option 1: VP60 = .033211 VP70 = .041762
Ethylbenzene						0.1396	0.0876	0.2162	106.1700	0.0054	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Heptane (-n)						0.7600	0.5088	1.1128	100.2000	0.1272	0.0403	100.20	Option 3: A=37358, B=8.2585
Hexane (-n)						2.3100	1.6303	3.2059	86.1700	0.0653	0.0628	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Iso-Butane						43.3083	34.4026	53.8185	58.1230	0.0097	0.1743	58.12	Option 1: VP60 = 38.14 VP70 = 45.16
Isopentane						11.8640	8.7212	15.5743	72.1500	0.0402	0.1985	72.15	Option 1: VP60 = 10.005 VP70 = 12.53
Methylcyclohexane						0.6886	0.4673	0.9913	98.1800	0.0978	0.0280	98.18	Option 2: A=6.823, B=1270.763, C=221.42
Nonane (-n)						0.0784	0.0568	0.1080	128.2600	0.0767	0.0025	128.26	Option 1: VP60 = .065278 VP70 = .08309
Octane (-n)						0.1769	0.1254	0.2493	114.2300	0.1216	0.0090	114.23	Option 1: VP60 = .145444 VP70 = .188224
Pentane (-n)						8.0308	5.9649	10.6537	72.1500	0.0361	0.1209	72.15	Option 3: A=27691, B=7.558
Toluene						0.4136	0.2726	0.6120	92.1300	0.0044	0.0008	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Water						0.3402	0.2160	0.5229	18.0150	0.0196	0.0028	18.02	Option 1: VP60 = .263 VP70 = .3679
Xylenes (mixed isomers)						0.1165	0.0728	0.1813	106.1700	0.0377	0.0018	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Los Mestenios - T1 - Condensate ACT - Vertical Fixed Roof Tank
Gavilan, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	2,577.2156
Vapor Space Volume (cu ft):	1,625.2961
Vapor Density (lb/cu ft):	0.0405
Vapor Space Expansion Factor:	0.2940
Vented Vapor Saturation Factor:	0.3649
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,625.2961
Tank Diameter (ft):	14.7500
Vapor Space Outage (ft):	9.5117
Tank Shell Height (ft):	16.0000
Average Liquid Height (ft):	7.5000
Roof Outage (ft):	1.0117
Roof Outage (Dome Roof)	
Roof Outage (ft):	1.0117
Dome Radius (ft):	14.7500
Shell Radius (ft):	7.3750
Vapor Density	
Vapor Density (lb/cu ft):	0.0405
Vapor Molecular Weight (lb/lb-mole):	66.3334
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Daily Avg. Liquid Surface Temp. (deg. R):	527.0322
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.9042
Tank Paint Solar Absorptance (Shell):	0.6800
Tank Paint Solar Absorptance (Roof):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.2940
Daily Vapor Temperature Range (deg. R):	53.7176
Daily Vapor Pressure Range (psia):	1.7309
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	2.6161
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	4.3471
Daily Avg. Liquid Surface Temp. (deg R):	527.0322
Daily Min. Liquid Surface Temp. (deg R):	513.6028
Daily Max. Liquid Surface Temp. (deg R):	540.4617
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3649
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	3.4523
Vapor Space Outage (ft):	9.5117
Working Losses (lb):	793.8586

Vapor Molecular Weight (lb/lb-mole):	66.3334
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Annual Net Throughput (gal/yr.):	145,596.0000
Annual Turnovers:	7.6000
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	19,173.0000
Maximum Liquid Height (ft):	15.0000
Tank Diameter (ft):	14.7500
Working Loss Product Factor:	1.0000

Total Losses (lb):	3,371.0743

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Los Mestenios - T1 - Condensate ACT - Vertical Fixed Roof Tank
Gavilan, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Condensate	793.86	2,577.22	3,371.07
Iso-Butane	138.34	449.12	587.46
Water	2.21	7.16	9.37
Butane (-n)	256.15	831.58	1,087.73
Isopentane	157.62	511.69	669.30
Pentane (-n)	96.01	311.70	407.71
Cyclopentane	0.58	1.88	2.46
Hexane (-n)	49.88	161.94	211.82
Cyclohexane	18.26	59.29	77.56
Heptane (-n)	31.97	103.80	135.78
Methylcyclohexane	22.27	72.28	94.55
2,2,4-Trimethylpentane (isooctane)	0.91	2.96	3.87
Benzene	4.57	14.84	19.41
Toluene	0.60	1.95	2.55
Ethylbenzene	0.25	0.81	1.07
Xylenes (mixed isomers)	1.45	4.72	6.17
Octane (-n)	7.11	23.10	30.21
Nonane (-n)	1.99	6.46	8.45
Decane (-n)	3.68	11.93	15.61

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Los Mestenios - T2 - Condensate ACT
City:	Gavilan
State:	New Mexico
Company:	Harvest Four Corners, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	400 Barrel Condensate Storage Tank

Tank Dimensions

Shell Height (ft):	16.00
Diameter (ft):	13.50
Liquid Height (ft) :	15.00
Avg. Liquid Height (ft):	7.50
Volume (gallons):	16,061.00
Turnovers:	9.07
Net Throughput(gal/yr):	145,596.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	0.00
Radius (ft) (Dome Roof)	13.50

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Los Mestenios - T2 - Condensate ACT - Vertical Fixed Roof Tank
Gavilan, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate	All	67.36	53.93	80.79	59.23	3.4523	2.6161	4.3471	66.3334			95.42	
2,2,4-Trimethylpentane (isooctane)						0.7338	0.4989	1.0546	114.2300	0.0038	0.0011	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4274	0.9846	2.0237	78.1100	0.0097	0.0058	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Butane (-n)						29.9357	23.3576	34.6684	58.1230	0.0259	0.3227	58.12	Option 1: VP60 = 26.1 VP70 = 31.31
Cyclohexane						1.4738	1.0254	2.0729	84.1600	0.0375	0.0230	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Cyclopentane						4.9596	3.6370	6.6394	70.1300	0.0004	0.0007	70.13	Option 1: VP60 = 4.177 VP70 = 5.24
Decane (-n)						0.0395	0.0291	0.0536	142.2900	0.2813	0.0046	142.29	Option 1: VP60 = .033211 VP70 = .041762
Ethylbenzene						0.1396	0.0876	0.2162	106.1700	0.0054	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Heptane (-n)						0.7600	0.5088	1.1128	100.2000	0.1272	0.0403	100.20	Option 3: A=37358, B=8.2585
Hexane (-n)						2.3100	1.6303	3.2059	86.1700	0.0653	0.0628	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Iso-Butane						43.3083	34.4026	53.8185	58.1230	0.0097	0.1743	58.12	Option 1: VP60 = 38.14 VP70 = 45.16
Isopentane						11.8640	8.7212	15.5743	72.1500	0.0402	0.1985	72.15	Option 1: VP60 = 10.005 VP70 = 12.53
Methylcyclohexane						0.6886	0.4673	0.9913	98.1800	0.0978	0.0280	98.18	Option 2: A=6.823, B=1270.763, C=221.42
Nonane (-n)						0.0784	0.0568	0.1080	128.2600	0.0767	0.0025	128.26	Option 1: VP60 = .065278 VP70 = .08309
Octane (-n)						0.1769	0.1254	0.2493	114.2300	0.1216	0.0090	114.23	Option 1: VP60 = .145444 VP70 = .188224
Pentane (-n)						8.0308	5.9649	10.6537	72.1500	0.0361	0.1209	72.15	Option 3: A=27691, B=7.558
Toluene						0.4136	0.2726	0.6120	92.1300	0.0044	0.0008	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Water						0.3402	0.2160	0.5229	18.0150	0.0196	0.0028	18.02	Option 1: VP60 = .263 VP70 = .3679
Xylenes (mixed isomers)						0.1165	0.0728	0.1813	106.1700	0.0377	0.0018	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Los Mestenios - T2 - Condensate ACT - Vertical Fixed Roof Tank
Gavilan, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	2,151.7664
Vapor Space Volume (cu ft):	1,349.2223
Vapor Density (lb/cu ft):	0.0405
Vapor Space Expansion Factor:	0.2940
Vented Vapor Saturation Factor:	0.3670
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,349.2223
Tank Diameter (ft):	13.5000
Vapor Space Outage (ft):	9.4260
Tank Shell Height (ft):	16.0000
Average Liquid Height (ft):	7.5000
Roof Outage (ft):	0.9260
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.9260
Dome Radius (ft):	13.5000
Shell Radius (ft):	6.7500
Vapor Density	
Vapor Density (lb/cu ft):	0.0405
Vapor Molecular Weight (lb/lb-mole):	66.3334
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Daily Avg. Liquid Surface Temp. (deg. R):	527.0322
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.9042
Tank Paint Solar Absorptance (Shell):	0.6800
Tank Paint Solar Absorptance (Roof):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.2940
Daily Vapor Temperature Range (deg. R):	53.7176
Daily Vapor Pressure Range (psia):	1.7309
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	2.6161
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	4.3471
Daily Avg. Liquid Surface Temp. (deg R):	527.0322
Daily Min. Liquid Surface Temp. (deg R):	513.6028
Daily Max. Liquid Surface Temp. (deg R):	540.4617
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3670
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	3.4523
Vapor Space Outage (ft):	9.4260
Working Losses (lb):	793.8586

Vapor Molecular Weight (lb/lb-mole):	66.3334
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.4523
Annual Net Throughput (gal/yr.):	145,596.0000
Annual Turnovers:	9.0700
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	16,061.0000
Maximum Liquid Height (ft):	15.0000
Tank Diameter (ft):	13.5000
Working Loss Product Factor:	1.0000

Total Losses (lb):	2,945.6250

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Los Mestenios - T2 - Condensate ACT - Vertical Fixed Roof Tank
Gavilan, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Condensate	793.86	2,151.77	2,945.63
Iso-Butane	138.34	374.98	513.32
Butane (-n)	256.15	694.30	950.45
Isopentane	157.62	427.22	584.83
Pentane (-n)	96.01	260.24	356.25
Cyclopentane	0.58	1.57	2.15
Hexane (-n)	49.88	135.21	185.09
Cyclohexane	18.26	49.50	67.77
Heptane (-n)	31.97	86.67	118.64
Methylcyclohexane	22.27	60.35	82.62
2,2,4-Trimethylpentane (isooctane)	0.91	2.47	3.38
Benzene	4.57	12.39	16.96
Toluene	0.60	1.63	2.23
Ethylbenzene	0.25	0.68	0.93
Xylenes (mixed isomers)	1.45	3.94	5.39
Octane (-n)	7.11	19.28	26.40
Nonane (-n)	1.99	5.39	7.38
Decane (-n)	3.68	9.96	13.64
Water	2.21	5.98	8.19

Simulation Report

Symmetry

File Name:	Los Mestenios Emissions Flash Model 2021 Actuals 1.14.2022
Company:	VMG, a Schlumberger Technology
Customer:	
Project:	
Job No:	
Prepared By:	
Report Date:	Friday, January 14, 2022
Unit Set:	Field

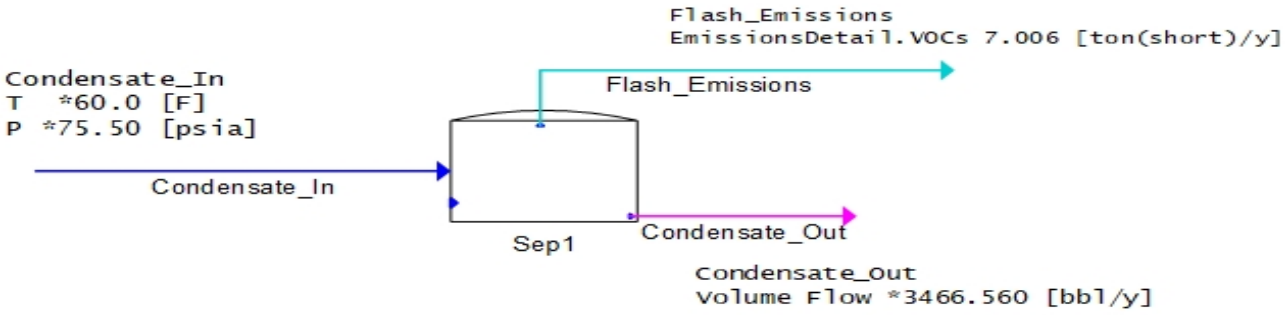
File: U:\Environmental\Condensate Flash Calcs\Los Mestenios Emissions Flash Model 2021 Actuals 1.14.2022.vsym

Symmetry

Main Flowsheet

*Bold face throughout the report denotes specified values.

*Italic face throughout the report denotes recycle values.


Flash_Emissions
EmissionsDetail.VOCs 7.006 [ton(short)/y]
Condensate_In
T *60.0 [F]
P *75.50 [psia]
Flash_Emissions
Condensate_In
Sep1
Condensate_Out
Condensate_Out
Volume Flow *3466.560 [bbl/y]

/Condensate_In (Material Stream)

Thermo Model: APRNGL2

Connections

Material Inlets

	Connection	Up Stream Unit Op
In	<Disconnected>	---

Material Outlets

	Connection	Down Stream Unit Op
Out	Sep1.In0	---

Allocation / Product Allocation

Auto Calculate	**False**	Is Up To Date	False
Status	Y?No Results		

Equilibrium Results

	Bulk	**Vap**	**Liq0**	**Liq1**
Phase Frac [Fraction]	1.00	0.0357	0.8681	0.0962
T [F]	60.0	60.0	60.0	60.0
P [psia]	75.50	75.50	75.50	75.50
Mole Flow [lbmol/h]	1.10	0.04	0.96	0.11
Mass Flow [lb/h]	102.98	0.79	100.28	1.91
Fraction [Fraction]				
NITROGEN	0.0012	0.0290	2.02E-04	1.66E-06
METHANE	0.0497	0.8514	0.0222	1.06E-04
CARBON DIOXIDE	1.14E-04	0.0011	8.69E-05	3.25E-06
ETHANE	0.0102	0.0547	0.0094	1.01E-05
PROPANE	0.0056	0.0095	0.0060	1.16E-06
ISOBUTANE	0.0164	0.0110	0.0184	7.48E-07
n-BUTANE	0.0443	0.0196	0.0503	1.96E-06
ISOPENTANE	0.0523	0.0088	0.0599	5.00E-07
n-PENTANE	0.0462	0.0058	0.0530	4.94E-07
CYCLOPENTANE	4.53E-04	2.94E-05	5.21E-04	1.89E-08
n-HEXANE	0.0672	0.0023	0.0773	1.88E-07
METHYLCYCLOHEXANE	0.0873	7.77E-04	0.1006	3.16E-07
2,2,4-TRIMETHYLPENTANE	0.0029	3.05E-05	0.0033	8.33E-10
BENZENE	0.0110	3.11E-04	0.0126	5.85E-06
CYCLOHEXANE	0.0393	8.42E-04	0.0452	5.71E-07
n-HEPTANE	0.1114	0.0011	0.1283	6.65E-08
TOLUENE	0.0042	3.12E-05	0.0048	5.98E-07
n-OCTANE	0.0931	2.98E-04	0.1072	1.07E-08
ETHYLBENZENE	0.0045	1.17E-05	0.0052	1.82E-07
m-XYLENE	0.0214	4.29E-05	0.0247	7.30E-07
o-XYLENE	0.0096	1.50E-05	0.0111	4.18E-07
n-NONANE	0.0523	5.14E-05	0.0603	5.30E-09
n-DECANE	0.0024	7.43E-07	0.0028	1.01E-10
n-UNDECANE	0.0852	7.34E-06	0.0981	1.30E-09
n-DODECANE	0.0852	2.31E-06	0.0981	6.25E-10
WATER	0.0967	0.0034	4.10E-04	0.9999

/Condensate_Out (Material Stream)

Thermo Model: APRNGL2

Connections

Material Inlets

	Connection	Up Stream Unit Op
In	Sep1.Liq0	---

Material Outlets

	Connection	Down Stream Unit Op
Out	<Disconnected>	---

Allocation / Product Allocation

Auto Calculate	**False**	Is Up To Date	False
Status	Y?No Results		

Equilibrium Results

	Bulk	**Vap**	**Liq0**	**Liq1**
Phase Frac [Fraction]	1.00	0.00	1.00	
T [F]	60.0	60.0	60.0	
P [psia]	13.00	13.00	13.00	
Mole Flow [lbmol/h]	1.01	0.00	1.01	
Mass Flow [lb/h]	100.21	0.00	100.21	
Fraction [Fraction]				
NITROGEN	1.58E-05	0.0148	1.58E-05	
METHANE	0.0024	0.5885	0.0024	
CARBON DIOXIDE	1.59E-05	0.0012	1.59E-05	
ETHANE	0.0026	0.0957	0.0026	
PROPANE	0.0033	0.0316	0.0033	
ISOBUTANE	0.0135	0.0487	0.0135	
n-BUTANE	0.0400	0.0932	0.0400	
ISOPENTANE	0.0529	0.0456	0.0529	
n-PENTANE	0.0476	0.0304	0.0476	
CYCLOPENTANE	4.79E-04	1.58E-04	4.79E-04	
n-HEXANE	0.0720	0.0121	0.0720	
METHYLCYCLOHEXANE	0.0946	0.0041	0.0946	
2,2,4-TRIMETHYLPENTANE	0.0031	1.60E-04	0.0031	
BENZENE	0.0118	0.0017	0.0118	
CYCLOHEXANE	0.0423	0.0045	0.0423	
n-HEPTANE	0.1207	0.0061	0.1207	
TOLUENE	0.0045	1.66E-04	0.0045	
n-OCTANE	0.1011	0.0015	0.1011	
ETHYLBENZENE	0.0049	6.13E-05	0.0049	
m-XYLENE	0.0233	2.24E-04	0.0233	
o-XYLENE	0.0105	7.81E-05	0.0105	
n-NONANE	0.0569	2.62E-04	0.0569	
n-DECANE	0.0026	3.70E-06	0.0026	
n-UNDECANE	0.0926	3.58E-05	0.0926	
n-DODECANE	0.0926	1.10E-05	0.0926	
WATER	0.1035	0.0191	0.1035	

/Flash_Emissions (Material Stream)

Thermo Model: APRNGL2

Connections

Material Inlets

	Connection	Up Stream Unit Op
In	Sep1.Vap	---

Material Outlets

	Connection	Down Stream Unit Op
Out	<Disconnected>	---

Allocation / Product Allocation

Auto Calculate	**False**	Is Up To Date	False
Status	Y?No Results		

Equilibrium Results

	Bulk	**Vap**	**Liq0**	**Liq1**
Phase Frac [Fraction]	1.00	1.00	0.00	
T [F]	60.0	60.0	60.0	
P [psia]	13.00	13.00	13.00	
Mole Flow [lbmol/h]	0.09	0.09	0.00	
Mass Flow [lb/h]	2.77	2.77	0.00	
Fraction [Fraction]				
NITROGEN	0.0148	0.0148	1.58E-05	
METHANE	0.5885	0.5885	0.0024	
CARBON DIOXIDE	0.0012	0.0012	1.59E-05	
ETHANE	0.0957	0.0957	0.0026	
PROPANE	0.0316	0.0316	0.0033	
ISOBUTANE	0.0487	0.0487	0.0135	
n-BUTANE	0.0932	0.0932	0.0400	
ISOPENTANE	0.0456	0.0456	0.0529	
n-PENTANE	0.0304	0.0304	0.0476	
CYCLOPENTANE	1.58E-04	1.58E-04	4.79E-04	
n-HEXANE	0.0121	0.0121	0.0720	
METHYLCYCLOHEXANE	0.0041	0.0041	0.0946	
2,2,4-TRIMETHYLPENTANE	1.60E-04	1.60E-04	0.0031	
BENZENE	0.0017	0.0017	0.0118	
CYCLOHEXANE	0.0045	0.0045	0.0423	
n-HEPTANE	0.0061	0.0061	0.1207	
TOLUENE	1.66E-04	1.66E-04	0.0045	
n-OCTANE	0.0015	0.0015	0.1011	
ETHYLBENZENE	6.13E-05	6.13E-05	0.0049	
m-XYLENE	2.24E-04	2.24E-04	0.0233	
o-XYLENE	7.81E-05	7.81E-05	0.0105	
n-NONANE	2.62E-04	2.62E-04	0.0569	
n-DECANE	3.70E-06	3.70E-06	0.0026	
n-UNDECANE	3.58E-05	3.58E-05	0.0926	
n-DODECANE	1.10E-05	1.10E-05	0.0926	
WATER	0.0191	0.0191	0.1035	

Storage Tank Actual Emissions Calculations

Unit Number: T3
Description: Produced Water Tank

Note: The data on this worksheet applies to each individual emissions unit identified above.

Throughput

70	bbl/turnover	Tank capacity	Harvest Four Corners, LLC
1.88	turnover/yr	Turnovers per year	Harvest Four Corners, LLC
132	bbl/yr	Annual liquid throughput	bbl/turnover x turnover/yr

Emission Rates

Pollutant	Emission Factor, lb/bbl	Uncontrolled, Emission Rate, tpy
VOC	0.262	1.72E-02

VOC emission factor is taken from the CDPHE PS Memo 09-02 (Oil & Gas Produced Water Tank Batteries - Regulatory Definitions & Permitting Guidance)
Uncontrolled Emission Rates (tpy) = lb/bbl x bbl/yr / 2,000 lb/ton

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Los Mestenios - T7 - Methanol
City:	Gavilan
State:	New Mexico
Company:	Harvest Four Corners, LLC
Type of Tank:	Horizontal Tank
Description:	500 Gallon Methanol Storage Tank

Tank Dimensions

Shell Length (ft):	6.00
Diameter (ft):	4.00
Volume (gallons):	500.00
Turnovers:	12.00
Net Throughput(gal/yr):	6,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Los Mestenios - T7 - Methanol - Horizontal Tank
Gavilan, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Methyl alcohol	All	67.36	53.93	80.79	59.23	1.8115	1.1881	2.6951	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Los Mestenios - T7 - Methanol - Horizontal Tank
Gavilan, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	36.5024
Vapor Space Volume (cu ft):	48.0243
Vapor Density (lb/cu ft):	0.0103
Vapor Space Expansion Factor:	0.2419
Vented Vapor Saturation Factor:	0.8389
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	48.0243
Tank Diameter (ft):	4.0000
Effective Diameter (ft):	5.5293
Vapor Space Outage (ft):	2.0000
Tank Shell Length (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0103
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.8115
Daily Avg. Liquid Surface Temp. (deg. R):	527.0322
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.9042
Tank Paint Solar Absorptance (Shell):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.2419
Daily Vapor Temperature Range (deg. R):	53.7176
Daily Vapor Pressure Range (psia):	1.5070
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.8115
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	1.1881
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	2.6951
Daily Avg. Liquid Surface Temp. (deg R):	527.0322
Daily Min. Liquid Surface Temp. (deg R):	513.6028
Daily Max. Liquid Surface Temp. (deg R):	540.4617
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8389
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	1.8115
Vapor Space Outage (ft):	2.0000
Working Losses (lb):	8.2917
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.8115
Annual Net Throughput (gal/yr.):	6,000.0000
Annual Turnovers:	12.0000
Turnover Factor:	1.0000

Tank Diameter (ft):	4.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	44.7941

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Los Mestenios - T7 - Methanol - Horizontal Tank
Gavilan, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Methyl alcohol	8.29	36.50	44.79

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Section 4

Federal Regulations Applicability

FEDERAL REGULATIONS CITATION	Title	Applies to Entire Facility	Applies to Unit No(s).	Does Not Apply	JUSTIFICATION:
40 CFR 50	NAAQS	✓			This regulation is applicable because it applies to all sources in the United States.
NSPS 40 CFR 60, Subpart A	General Provisions		1, 2 & F1		This regulation is applicable because 40 CFR Part 60 Subpart GG is applicable.
NSPS 40 CFR 60, Subpart K	Standards of Performance for Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978			✓	This regulation is not applicable because the petroleum liquids storage tanks at the facility have capacities less than the minimum applicability threshold capacity of 40,000 gallons (see §60.110(a)).
NSPS 40 CFR 60, Subpart Ka	Standards of Performance for Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984			✓	This regulation is not applicable because the storage tanks at the facility have capacities less than the minimum applicability threshold capacity of 40,000 gallons (see §60.110a(a)).
NSPS 40 CFR 60, Subpart Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984			✓	This regulation is not applicable because all storage tanks at the facility have capacities less than the minimum applicability threshold capacity of 75 cubic meters (19,812 gallons), or they have a capacity between 75 and 151 cubic meters (40,000 gallons) and store a liquid with a maximum true vapor pressure less than 15.0 kPa (2.2 psi), or store petroleum prior to custody transfer (see §60.110b(a) & §60.110b(b) & §60.110b(d)(4)).
NSPS 40 CFR, Subpart GG	Standards of Performance for Stationary Gas Turbines		1		The regulation is applicable as the facility is equipped with a stationary gas turbine with heat input equal to 10 MMBtu/hour or greater, installed on or after October 3, 1977.

FEDERAL REGU-LATIONS CITATION	Title	Applies to Entire Facility	Applies to Unit No(s).	Does Not Apply	JUSTIFICATION:
NSPS 40 CFR 60, Subpart KKK	Standards of Performance for Equipment Leaks of VOC from Onshore Gas Plants			✓	This regulation is not applicable because the facility is not an onshore natural gas processing plant as defined by the subpart (see §60.630(a)(1)). Natural gas processing plant (gas plant) means any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both (see §60.631).
NSPS 40 CFR Part 60 Subpart LLL	Standards of Performance for Onshore Natural Gas Processing: SO_2 Emissions			✓	This regulation is not applicable because the facility is not a natural gas processing plant as defined by the subpart. It is not equipped with a sweetening unit (see §60.640(a)).
NSPS 40 CFR 60, Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines			✓	This regulation is not applicable because the facility is not equipped with stationary compression ignition (CI) internal combustion engines (ICE) that commenced construction after July 11, 2005 and were manufactured after April 1, 2006 (see §60.4200(a)(2)(i)). For the purpose of this subpart, construction commences on the date the engine is ordered by the owner or operator (see §60.4200(a)).
NSPS 40 CFR 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines			✓	This regulation is not applicable because the facility is not equipped with spark ignition (SI) internal combustion engines (ICE) constructed, modified, or reconstructed after June 12, 2006. Units 2 & 3 were constructed prior to the applicability date and have not been modified or reconstructed. See the definitions of construction, modification, and reconstruction referenced in Subpart OOOO below.
NSPS 40 CFR 60 Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution			✓	This regulation is not applicable because the facility is not equipped with "affected" sources that commenced construction, modification or reconstruction after August 23, 2011 and on or before September 18, 2015: gas wells, centrifugal or reciprocating compressors, pneumatic controllers, and storage vessels (see §60.5365). Note that the facility is not a natural gas processing plant as defined by the subpart (see §60.5430). Commenced construction means a continuous program of fabrication, erection or installation (see §60.2). Modification means any physical change in or change in the method of operation of an existing facility which increases emissions or results in new emissions (see §60.2). The following, by themselves, are not modifications: routine maintenance, repair or replacement, production increase without capital expenditure, increase in hours of operation, addition of emission controls, or the relocation or change in ownership of an existing facility (see §60.14). Reconstruction means the replacement of components of an existing facility such that the fixed capital cost of the new components exceeds 50 % of the fixed capital cost required to construct a comparable entirely new facility. Fixed capital cost means the capital needed to provide all the depreciable components (see §60.15).
NSPS 40 CFR 60, Subpart	Standards of Performance for Crude Oil and		2 & F1		This regulation is not applicable because the facility is not equipped with "affected" sources that commenced

FEDERAL REGU-LATIONS CITATION	Title	Applies to Entire Facility	Applies to Unit No(s).	Does Not Apply	JUSTIFICATION:
OOOOa	Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015				construction, modification or reconstruction after September 18, 2015: gas wells, centrifugal or reciprocating compressors, pneumatic controllers, storage vessels, sweetening units, pneumatic pumps, and equipment leaks (see §60.5365a). In general, this regulation may apply if existing affected equipment is replaced or new affected equipment is installed. In particular, this regulation will apply to fugitive emissions components at the facility if any engines and compressors are installed. Fugitive components monitoring is required if a compressor station is modified. For the purpose of fugitive components monitoring as required by this subpart, modification of a compressor station is the addition of a compressor or replacement of a compressor with a larger unit (greater total horsepower) (see §60.5365a(j)). Note that the facility is not a natural gas processing plant as defined by the subpart (see §60.5430a). See the definitions of construction, modification, and reconstruction referenced in Subpart OOOO above. Note that the Waukesha engine has not yet been installed. The facility will not be subject to this regulation until that unit is operational.
NESHAP 40 CFR 61 Subpart A	General Provisions			✓	This regulation is not applicable because no other 40 CFR Part 61 subparts apply (see §61.01(c)).
NESHAP 40 CFR 61 Subpart V	National Emission Standards for Equipment Leaks (Fugitive Emission Sources)			✓	This regulation is not applicable because none of the listed equipment at the facility is in VHAP service. The provisions of this subpart apply to each of the following sources that are intended to operate in volatile hazardous air pollutant (VHAP) service: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by this subpart (see §61.240(a)). VHAP service means a piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 10 percent by weight of VHAP. VHAP means a substance regulated under this subpart for which a standard for equipment leaks of the substance has been promulgated (see §61.241).
MACT 40 CFR 63, Subpart A	General Provisions		2 & 3		This regulation is applicable because 40 CFR 63 Subpart ZZZZ applies (see §63.1(b)).
MACT 40 CFR 63.760 Subpart HH	National Emission Standards for Hazardous Air Pollutants For Oil and Natural Gas Production Facilities			✓	This regulation is not applicable because the facility is not equipped with affected equipment. The facility is an area HAP source. Note that since it is a production field facility (located prior to the point of custody transfer), only HAP emissions from glycol dehydration units and storage vessels are aggregated for a major source determination. Storage vessels include crude oil tanks, condensate tanks, intermediate hydrocarbon liquid tanks, and produced water tanks (see §63.761). At area HAP facilities, the regulation is only applicable to dehydrators (see §63.760(b)(2)).

FEDERAL REGU-LATIONS CITATION	Title	Applies to Entire Facility	Applies to Unit No(s).	Does Not Apply	JUSTIFICATION:
MACT 40 CFR 63, Subpart HHH	National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities			✓	This regulation is not applicable because the facility is not a natural gas transmission and storage facility as defined by the subpart. A compressor station that transports natural gas prior to the point of custody transfer or to a natural gas processing plant (if present) are not considered a part of the natural gas transmission and storage source category (see §63.1270(a)).
MACT 40 CFR 63 Subpart YYYY	National Emissions Standards for Hazardous Air Pollutants for Stationary Combustion Turbines			✓	This regulation is not applicable, as the facility is an area HAP source (see §63.6080).
MACT 40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE MACT)		2 & 3		This regulation is applicable because the facility is equipped with affected sources. The station is an area HAP source as defined by the subpart. For production field facilities, only HAP emissions from engines, turbines, dehydrators, and storage vessels with the potential for flash emissions are aggregated for the HAP major source determination (see §63.6675). Unit 2 is a 4-stroke, lean burn (4SLB) spark ignition (SI) RICE with a site rating of more than 500 hp, and was constructed prior to December 19, 2002. Unit 3 is an emergency generator as defined by the Subpart.
NESHAP 40 CFR 64	Compliance Assurance Monitoring			✓	This regulation is not applicable because no equipment at the facility requires a control device to achieve compliance with emission limits or standards where pre control emissions equal or exceed the major source threshold (100 tons per year). (see §64.2(a)).
NESHAP 40 CFR 68	Chemical Accident Prevention			✓	This regulation is not applicable because the facility does not store any of the identified toxic and flammable substances in quantities exceeding the applicability thresholds (see §68.10(a), §68.115(a), and §68.130 Tables 1-4).
Title V – 40 CFR 70	State Operating Permit Programs			✓	This regulation is not applicable because the facility is located within the exterior boundaries of the Jicarilla Apache Indian Reservation, and therefore not within the jurisdiction of the State of New Mexico Environment Department.
Title V – 40 CFR 71	Federal Operating Permit Programs	✓			This regulation is applicable because the facility is located within the exterior boundaries of the Jicarilla Apache Indian Reservation.
Title IV – Acid Rain 40 CFR 72	Acid Rain			✓	This regulation is not applicable because the facility does not operate a source subject to Title IV of the Clean Air Act (CAA).
Title IV – Acid Rain 40 CFR 73	Sulfur Dioxide Allowance Emissions			✓	This regulation is not applicable because the facility does not operate a source subject to Title IV of the Clean Air Act (CAA).
Title IV – Acid Rain 40 CFR 76	Acid Rain Nitrogen Oxides Emission Reduction			✓	This regulation is not applicable to the facility because it does not operate a source subject to Title IV of the Clean Air Act (CAA).

FEDERAL REGU-LATIONS CITATION	Title	Applies to Entire Facility	Applies to Unit No(s).	Does Not Apply	JUSTIFICATION:
	Program				
Title VI – 40 CFR 82	Protection of Stratospheric Ozone			✓	This regulation is not applicable to the facility because it does not produce, manufacture, transform, destroy, import, or export ozone-depleting substances; does not maintain or service motor vehicle air conditioning units or refrigeration equipment; and does not sell, distribute, or offer for sale or distribution any product that contains ozone-depleting substances.