



West Virginia Department of Environmental Protection

Division of Air Quality
601 57th Street
SE Charleston, WV 25304
Phone (304) 926-0475
Fax (304) 926-0479
www.dep.wv.gov

G70-D GENERAL PERMIT REGISTRATION APPLICATION
PREVENTION AND CONTROL OF AIR POLLUTION IN REGARD TO THE CONSTRUCTION, MODIFICATION,
RELOCATION, ADMINISTRATIVE UPDATE AND OPERATION OF
NATURAL GAS PRODUCTION FACILITIES LOCATED AT THE WELL SITE

- | | |
|--|---|
| <input checked="" type="checkbox"/> Construction | <input type="checkbox"/> Class I Administrative Update |
| <input type="checkbox"/> Modification | <input type="checkbox"/> Class II Administrative Update |
| <input type="checkbox"/> Relocation | |

SECTION 1. GENERAL INFORMATION

Name of Applicant (as registered with the WV Secretary of State's Office): **SWN Production Company, LLC**

Federal Employer ID No. (FEIN): **26-4388727**

Applicant's Mailing Address: **179 Innovation Drive**

City: State: **Jane Lew, WV 26378** ZIP Code: **26378**

Facility Name: **QUALITY RECLAMATION Production Facility**

Operating Site Physical Address:
If none available, list road, city or town and zip of facility. **413 CHINKS RUN ROAD**

City: Zip Code: **RIVERSVILLE, 26588** County: **Marion**

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: **-80.158282**
Longitude: **39.569004**

SIC Code: **1311** DAQ Facility ID No. (For existing facilities)


NAICS Code: **211111**

CERTIFICATION OF INFORMATION

This G70-B General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of the Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. Any administratively incomplete or improperly signed or unsigned G70-D Registration Application will be returned to the applicant. Furthermore, if the G70-D forms are not utilized, the application will be returned to the applicant. No substitution of forms is allowed.

I hereby certify that Carla Suszkowski is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Director of the Division of Air Quality immediately.

I hereby certify that all information contained in this G70-B General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible.

Responsible Official Signature: 

Name and Title: **Carla Suszkowski** Phone: **832-796-1000** Fax: **832-796-4818**
Regulatory Manager

Email: **carla_suszkowski@swn.com** Date: **4-5-17**

If applicable: Authorized Representative Signature: _____

Name and Title: _____ Phone: _____ Fax: _____

Email: _____ Date: _____

If applicable: Environmental Contact

Name and Title: **Clayton Murreal** Phone: **304-884-1715** Fax: **832-796-4818**
Staff Regulatory Specialist

Email: **clay_murreal@swn.com**

OPERATING SITE INFORMATION

Briefly describe the proposed new operation and/or any change(s) to the facility:

Addition of three (3) new wells to an existing facility with one (1) well, operating below permit thresholds.

Directions to the facility:

From I-79 N take exit 155. Take the ramp right and travel to the junction with route 7 across from Sheetz. Turn left onto route 7. Travel on route 7 until you reach Route 29(Jakes Run). Turn on Jakes Run and travel 8.41 miles to the county line. At the county line the road changes to route 25. Continue 3 miles to County Route 25/5. Turn on 25/5 and go 0.9 miles to the access road on the right.

ATTACHMENTS AND SUPPORTING DOCUMENTS

I have enclosed the following required documents:

<input type="checkbox"/> Check payable to WVDEP — Division of Air Quality with the appropriate application fee (per 45CSR13 and 45CSR22). <input type="checkbox"/> Check attached to front of application. <input type="checkbox"/> I wish to pay by electronic transfer. Contact for payment (incl. name and email address): <input type="checkbox"/> I wish to pay by credit card. Contact for payment (incl. name and email address): <input checked="" type="checkbox"/> \$500 (Construction, Modification, and Relocation) <input type="checkbox"/> \$300 (Class II Administrative Update) <input checked="" type="checkbox"/> \$1,000 NSPS fee for 40 CFR60, Subpart IIII, JJJJ and/or OOOO 1 <input type="checkbox"/> \$2,500 NESHAP fee for 40 CFR63, Subpart ZZZZ and/or HH 2 1 Only one NSPS fee will apply. 2 Only one NESHAP fee will apply. The Subpart ZZZZ NESHAP fee will be waived for new engines that satisfy requirements by complying with NSPS, Subparts IIII and/or JJJJ. NSPS and NESHAP fees apply to new construction or if the source is being modified.	
<input checked="" type="checkbox"/>	Responsible Official or Authorized Representative Signature (if applicable)
<input checked="" type="checkbox"/>	Single Source Determination Form (must be completed in its entirety) — Attachment A
<input checked="" type="checkbox"/>	Siting Criteria Waiver (if applicable) — Attachment B
<input checked="" type="checkbox"/>	Current Business Certificate — Attachment C
<input checked="" type="checkbox"/>	Process Flow Diagram — Attachment D
<input checked="" type="checkbox"/>	Process Description — Attachment E
<input checked="" type="checkbox"/>	Plot Plan — Attachment F
<input checked="" type="checkbox"/>	Area Map — Attachment G
<input checked="" type="checkbox"/>	G70-D Section Applicability Form — Attachment H
<input checked="" type="checkbox"/>	Emission Units/ERD Table — Attachment I
<input checked="" type="checkbox"/>	Fugitive Emissions Summary Sheet — Attachment J
<input checked="" type="checkbox"/>	Gas Well Affected Facility Data Sheet (if applicable) — Attachment K
<input checked="" type="checkbox"/>	Storage Vessel(s) Data Sheet (include gas sample data, HYSYS, etc.), etc. where applicable) — Attachment L
<input checked="" type="checkbox"/>	Natural Gas Fired Fuel Burning Unit(s) Data Sheet (GPUs, Heater Treaters, In-Line Heaters if applicable) — Attachment M
<input type="checkbox"/>	Internal Combustion Engine Data Sheet(s) (include manufacturer performance data sheet(s) if applicable) — Attachment N
<input checked="" type="checkbox"/>	Tanker Truck Loading Data Sheet (if applicable) — Attachment O
<input type="checkbox"/>	Glycol Dehydration Unit Data Sheet(s) (include wet gas analysis, GRI- GLYCalc ^{1M} input and output reports and information on reboiler if applicable) — Attachment P
<input checked="" type="checkbox"/>	Pneumatic Controllers Data Sheet — Attachment Q
<input type="checkbox"/>	Pneumatic Pump Data Sheet — Attachment R
<input type="checkbox"/>	Air Pollution Control Device/Emission Reduction Device(s) Sheet(s) (include manufacturer performance data sheet(s) if applicable) — Attachment S
<input checked="" type="checkbox"/>	Emission Calculations (please be specific and include all calculation methodologies used) — Attachment T
<input checked="" type="checkbox"/>	Facility-wide Emission Summary Sheet(s) — Attachment U
<input checked="" type="checkbox"/>	Class I Legal Advertisement — Attachment V
<input checked="" type="checkbox"/>	One (1) paper copy and two (2) copies of CD or DVD with pdf copy of application and attachments

ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM

Classifying multiple facilities as one “stationary source” under 45CSR13, 45CSR14, and 45CSR19 is based on the definition of Building, structure, facility, or installation as given in §45-14-2.13 and §45-19-2.12. The definition states:

“Building, Structure, Facility, or Installation” means all of the pollutant -emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same “Major Group” (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).

The source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and will become effective on August 2, 2016. EPA defined the term "adjacent" and stated that equipment and activities in the oil and gas sector that are under common control will be considered of the same source if they are located on the same site or on sites that share equipment and are within 1/4 miles of

Is there equipment and activities in the same industrial grouping (defined by SIC code)?

Yes

No

Is there equipment and activities under the control of the same person/people?

Yes

No

Is there equipment and activities located on the same site or on sites that share equipment and are within 1/4 mile of each other?

Yes

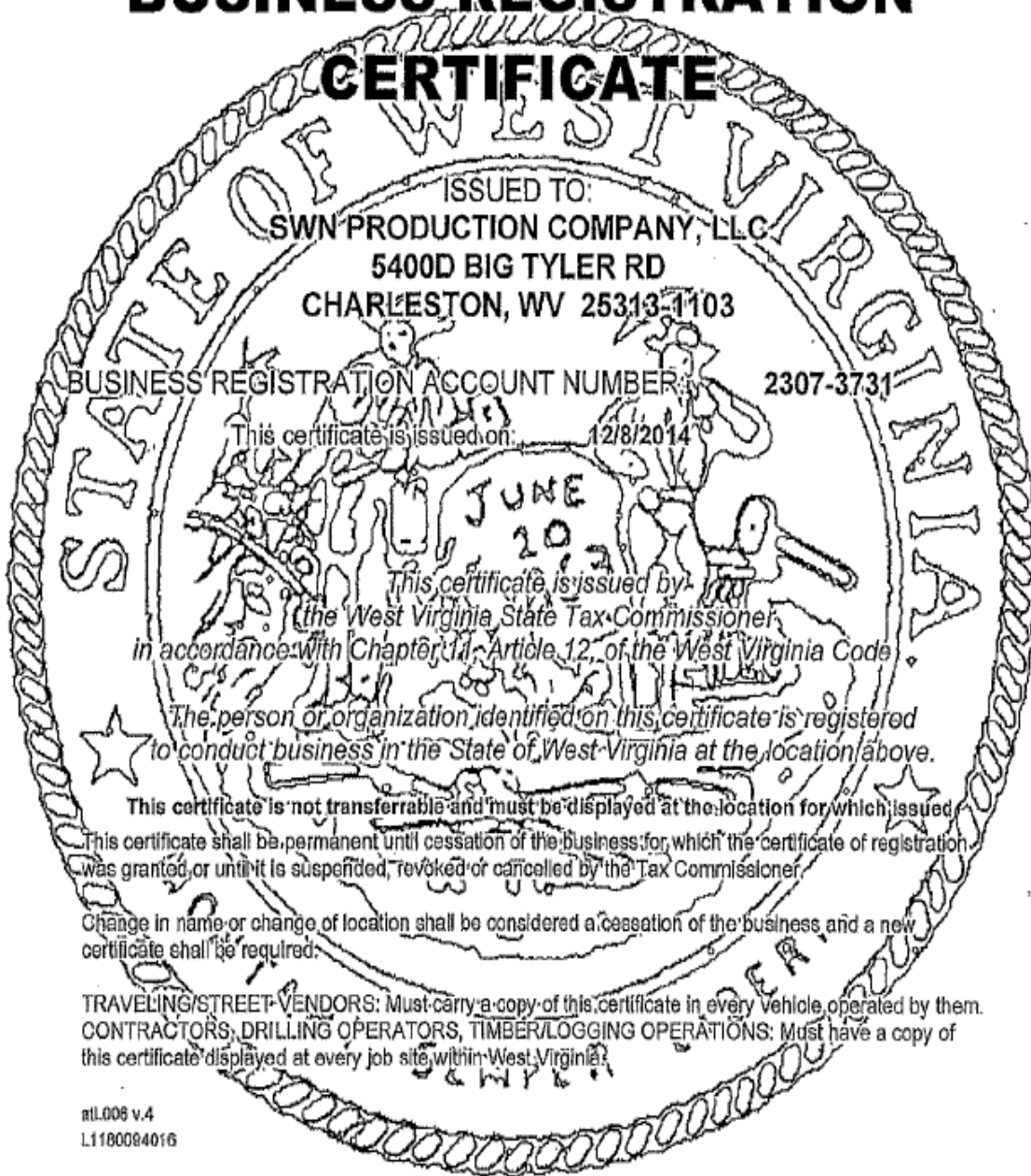
No

ATTACHMENT B - SITING CRITERIA WAIVER

If applicable, please complete this form and it must be notarized.

NOT APPLICABLE

**WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION
CERTIFICATE**



ISSUED TO:
SWN PRODUCTION COMPANY, LLC
5400D BIG TYLER RD
CHARLESTON, WV 25313-1103

BUSINESS REGISTRATION ACCOUNT NUMBER: 2307-3731

This certificate is issued on: 12/8/2014

This certificate is issued by
(the West Virginia State Tax Commissioner,
in accordance with Chapter 11, Article 12, of the West Virginia Code.

The person or organization identified on this certificate is registered
to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration
was granted, or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new
certificate shall be required.

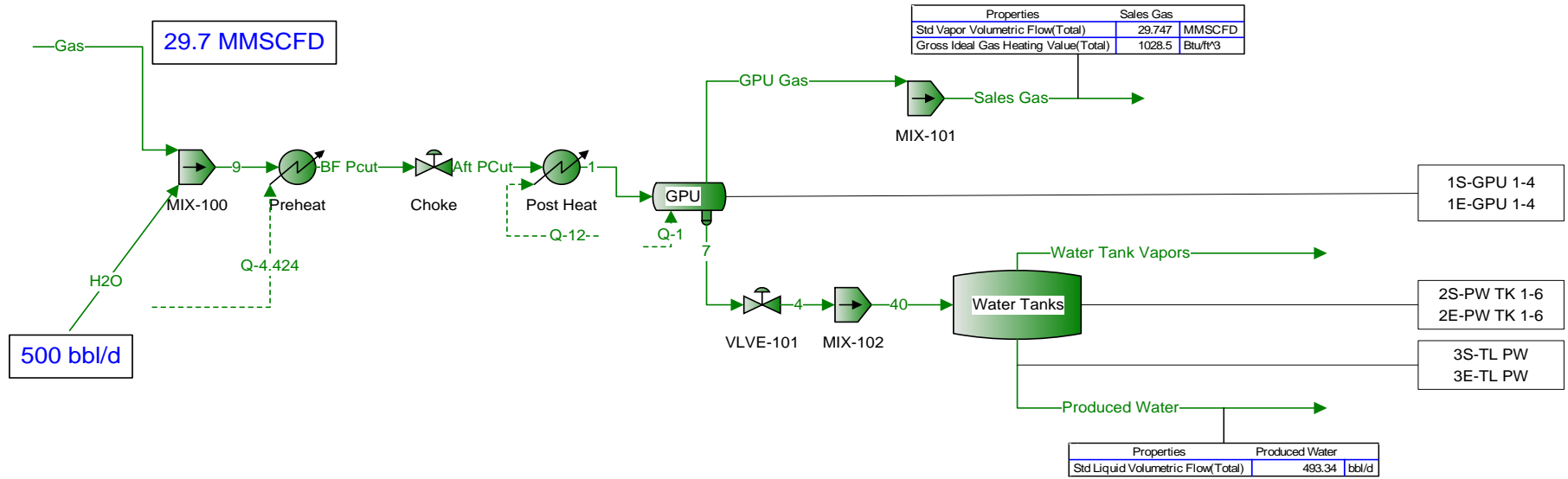
TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them.
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of
this certificate displayed at every job site within West Virginia.

**QUALITY RECLAMATION
Permit Determination**

Attachment D

BLOCK FLOW DIAGRAM

QUALITY RECLAMATION
PVT



Annual tank loss calculations for "40".
 Total working and breathing losses from the Vertical Cylinder are 0.001131 ton/yr.
 Flashing losses are 0.06189 ton/yr.
 Loading losses are 0.001082 ton/yr of loaded liquid.
 * Only Non-Exempt VOCs are reported.
 Vapor adjusted to ensure mass balance

Tank 1-6

**QUALITY RECLAMATION
Permit Determination**

Attachment E

QUALITY RECLAMATION-MRN-PAD1 PROCESS DESCRIPTION

The QUALITY RECLAMATION PAD is an unconventional oil and gas production facility located in Marion County, West Virginia. The facility process is proposed as follows.

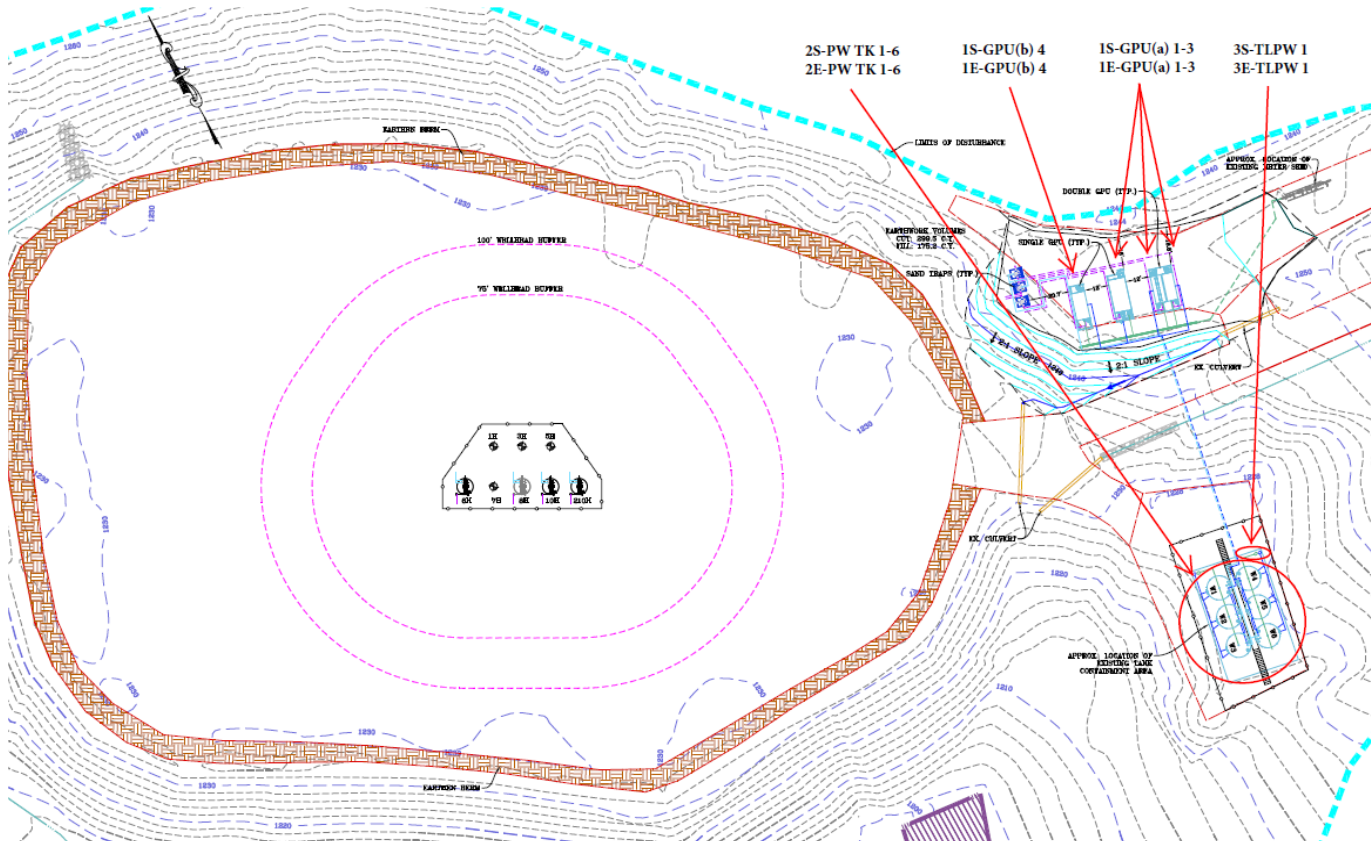
From the wellhead(s), the combined stream flows to the GAS PRODUCTION UNITS [1S -GPU(a) 1-3] [1S -GPU(b) 4] where separation occurs.

Gas from the GAS PRODUCTION UNITS [1S -GPU(a) 1-3] [1S -GPU(b) 4] is routed directly to the SALES LINE.

PRODUCED WATER from the GAS PRODUCTION UNITS [1S -GPU(a) 1-3] [1S -GPU(b) 4] is routed to the WATER TANKS [2S -PW TK 1-6] and loaded out via WATER TRUCK LOADOUT [3S -TLPW 1] .

Vapor from the WATER TANKS [2S -PW TK 1-6] and WATER TRUCK LOADOUT [3S -TLPW 1] is routed to ATMOSPHERE.

ATTACHMENT F – PLOT PLAN



A	

- LEGEND**
- ABOVE GROUND WELL HEAD DISCHARGE PIPING
 - BELOW GROUND WELL HEAD DISCHARGE PIPING
 - ABOVE GROUND GAS PIPING
 - ABOVE GROUND PRODUCED WATER PIPING
 - ABOVE GROUND OIL/CONDENSATE PIPING
 - ABOVE GROUND REINFORCEMENT PIPING
 - BELOW GROUND DISCHARGE PIPING
 - 1200' ELEVATION CONTOUR (2-FOOT INTERVAL)
 - BELOW GROUND 6-INCH SALES PIPING
 - WELL PAD SURFACE LEGITS
- ELECTRICAL WIRING SUPPORT**
- WIRING**
1. 12 PAIR WIRES FROM EACH WELLHEAD TO METERS NEAR THE HEADER
 2. 2 PAIR WIRES FROM HEADERS/METER AREA TO EDGE OF LOGCATHY TRASH ROAD FOR SPD
 3. 4 PAIR WIRES FROM HEADERS/METER AREA TO COMPRESSOR
 4. 24 PAIR WIRES FROM HEADERS/METER AREA TO TANK BATTERY FOR JUNCTION BOX
 5. 4 PAIR WIRES (GRADE) FROM HEADERS/METER AREA TO TANK BATTERY FOR JUNCTION BOX
 6. 12 PAIR WIRES FROM TANK BATTERY/JUNCTION BOX TO COMPRESSOR
 7. 4 PAIR WIRES FROM HEADERS/METER AREA TO THE UNIT
- TRG LINE**
1. UNIT MUST BE 25 FT FROM ANY FURD VESSEL
- NOTES**
1. ALL WIRING USED IS 18 GAUGE (EXCEPT THE 4 PAIR WIRES USED FOR THE TRG WHICH IS 12 GAUGE (EXCEPT APPROXIMATELY 10 - 15 FT OF EXTRA WIRE SHOULD BE LEFT AT ALL JUNCTIONS AND APPROXIMATELY 50 FT OF EXTRA WIRE AT THE COMPRESSOR)
 2. ALL WIRING SHOULD BE APPROXIMATELY 50 FT OF EXTRA WIRE AT THE COMPRESSOR
 3. LINKS COMING FROM EACH SPECIFIC WELLHEAD MUST BE MAJOR/CONTROLLED WITH ITS RESPECTIVE WELL OR CENTER AT THE OTHER END/JUNCTION NEAR THE HEADERS

QUALITY RECLAMATION
MARCELLUS SOUTH DISTRICT

COUNTY: MARION PAD #:

DRAWN BY: IVF DATE: 02/21/2017

CHECKED BY: AL DATE:

PROPERTY INFORMATION

WELL	PROPERTY #	AFE #
8H		
6H		
10H		
210H		

DRAWING #:	
REVISION: A	SHEET #: 1 OF 1
SCALE: 1"=25'	SHEET SIZE: ANSI-D
DO NOT SCALE DRAWING	

sw PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED HEREIN IS THE SOLE PROPERTY OF SOUTHWESTERN ENERGY AND IS LOANED TO YOU FOR CONSTRUCTION PURPOSES ONLY. ANY INFORMATION OR INVENTIONS THEREON SHALL BE THE PROPERTY OF SOUTHWESTERN ENERGY. SOUTHWESTERN ENERGY IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY.

ATTACHMENT G - AREA MAP

Proximity Map



Quality Reclamation Pad
 NAD83 UTM Zone 17N
 572.043 4,380.747 Kilometers
 -80.158282 39.569004 Decimal Degrees

- | | |
|------------------------|---------------------|
| Schools | Compressor Stations |
| Residential Structures | Processing Plant |
| Rivers and Lakes | Power Plant |
| Quality Rec .25 Mile | Hospital |
| Quality Rec 300ft | |

ATTACHMENT H – G70-D SECTION APPLICABILITY FORM

**General Permit G70-D Registration
Section Applicability Form**

General Permit G70-B was developed to allow qualified applicants to seek registration for a variety of sources. These sources include gas well affected facilities, storage vessels, gas production units, in-line heaters, heater treaters, glycol dehydration units and associated reboilers, pneumatic controllers, centrifugal compressors, reciprocating compressors, reciprocating internal combustion engines (RICEs), tank truck loading, fugitive emissions, completion combustion devices, flares, enclosed combustion devices, and vapor recovery systems. All registered facilities will be subject to Sections 1.0, 2.0, 3.0, and 4.0.

General Permit G70-B allows the registrant to choose which sections of the permit they are seeking registration under. Therefore, please mark which additional sections that you are applying for registration under. If the applicant is seeking registration under multiple sections, please select all that apply. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

GENERAL PERMIT G70-B APPLICABLE SECTIONS	
<input checked="" type="checkbox"/> Section 5.0	Gas Well Affected Facility (NSPS, Subpart OOOO/OOOOa)
<input checked="" type="checkbox"/> Section 6.0	Storage Vessels Containing Condensate and/or Produced Water ¹
<input type="checkbox"/> Section 7.0	Storage Vessel Affected Facility (NSPS, Subpart OOOO/OOOOa)
<input type="checkbox"/> Section 8.0	Control Devices and Emission Reduction Devices not subject to NSPS Subpart OOOO and/or NESHAP Subpart HH
<input checked="" type="checkbox"/> Section 9.0	Small Heaters and Reboilers not subject to 40CFR60 Subpart Dc
<input type="checkbox"/> Section 10.0	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO/OOOOa)
<input type="checkbox"/> Section 11.0	Centrifugal Compressor Affected Facility (NSPS, Subpart OOOO/OOOOa)
<input type="checkbox"/> Section 12.0	Reciprocating Compressor Affected Facility (NSPS, Subpart OOOO/OOOOa) ²
<input type="checkbox"/> Section 13.0	Reciprocating Internal Combustion Engines, Generator Engines, Microturbines
<input checked="" type="checkbox"/> Section 14.0	Tanker Truck Loading ²
<input type="checkbox"/> Section 15.0	Glycol Dehydration Units ³

1 Applicants that are subject to Section 6 may also be subject to Section 7 if the applicant is subject to the NSPS, Subpart OOOO or OOOOa control requirements or the applicable control device requirements of Section 8.

2 Applicants that are subject to Section 14 may also be subject to control device and emission reduction device requirements of Section 8.

3 Applicants that are subject to Section 15 may also be subject to the requirements of Section 9 (reboilers). Applicants that are subject to Section 15 may also be subject to control device and emission reduction device requirements of Section 8.

ATTACHMENT I – EMISSION UNITS / EMISSION REDUCTION DEVICES (ERD) TABLE

Include ALL emission units and air pollution control devices/ERDs that will be part of this permit application review. Do not include fugitive emission sources in this table. Deminimis storage tanks shall be listed in the Attachment L table. This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

Emission Unit ID ¹	Emission Point ID ²	Emission Unit Description	Year Installed	Manufac. Date ³	Design Capacity		Type ⁴ and Date of Change	Control Device(s) ⁵	ERD(s) ⁶
[1S -GPU(a) 1-3]	[1E -GPU(a) 1-3]	GAS PRODUCTION UNITS	2012	NA	1.00	MMBTU/hr	EXISTING	NONE	NONE
[1S -GPU(b) 4]	[1E -GPU(b) 4]	GAS PRODUCTION UNITS	TBD	NA	1.50	MMBTU/hr	NEW	NONE	NONE
[2S -PW TK 1-6]	[2E -PW TK 1-6]	WATER TANKS	TBD	NA	400	bb1	EXISTING	NONE	NONE
[3S -TLPW 1]	[3E -TLPW 1]	WATER TRUCK LOADOUT	TBD	NA	7,665,000	gal/yr	EXISTING	NONE	NONE

¹For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.

ATTACHMENT J – FUGITIVE EMISSIONS SUMMARY SHEET

Sources of fugitive emissions may include loading operations, equipment leaks, blowdown emissions, etc.
Use extra pages for each associated source or equipment if necessary.

Source/Equipment: Facility									
Leak Detection Method Used		<input type="checkbox"/> Audible, visual, olfactory (AVO) inspections		<input checked="" type="checkbox"/> Infrared (FLIR) cameras		<input type="checkbox"/> Other (please describe)		<input type="checkbox"/> None required	
Component Type	Closed Vent System	Count	Source of Leak Factors (EPA, other (specify))	Stream type (gas, liquid, etc.)	Estimated Emissions (tpy)				
					VOC	HAP	GHG (CO _{2e})		
Pumps	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0	EPA	<input checked="" type="checkbox"/> Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Both	0.00	0.00	0.00		
Valves	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	36	EPA	<input checked="" type="checkbox"/> Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Both	0.28	0.00	36.81		
Safety Relief Valves	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8	EPA	<input checked="" type="checkbox"/> Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Both	0.54	0.03	0.27		
Open Ended Lines	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2	EPA	<input checked="" type="checkbox"/> Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Both	0.01	0.14	0.91		
Sampling Connections	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6	EPA	<input checked="" type="checkbox"/> Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Both	0.09	0.00	12.00		
Connections (Not sampling)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	156	EPA	<input checked="" type="checkbox"/> Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Both	0.06	0.00	1.79		
Compressors	<input type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Both					
Flanges	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	170	EPA	<input checked="" type="checkbox"/> Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Both	0.10	0.00	13.30		
Other ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Both					

¹ Other equipment types may include compressor seals, relief valves, diaphragms, drains, meters, etc.

Please provide an explanation of the sources of fugitive emissions (e.g. pigging operations, equipment blowdowns, pneumatic controllers, etc.):

Fugitive emissions occur at sealed surfaces associated with production equipment, including equipment leaks, pneumatic controllers and blowdowns.

Please indicate if there are any closed vent bypasses (include component):

No bypasses to atmosphere that are not safety equipment.

Specify all equipment used in the closed vent system (e.g. VRU, ERD, thief hatches, tanker truck loading, etc.)

**Tank Hatches
Truck Loading**

ATTACHMENT K – GAS WELL AFFECTED FACILITY DATA SHEET

Complete this data sheet if you are the owner or operator of a gas well affected facility for which construction, modification or reconstruction commenced after August 23, 2011. This form must be completed for natural gas well affected facilities regardless of when flowback operations occur (or have occurred).

API Number	Date of Flowback	Date of Well Completion	Green Completion and/or Combustion Device	Subject to OOOO or OOOOa?
4704902159	06/19/12	05/21/12	GREEN COMPLETION	NO
4704902425	TBD	TBD	GREEN COMPLETION	0000a
4704902421	TBD	TBD	GREEN COMPLETION	0000a
4704902424	TBD	TBD	GREEN COMPLETION	0000a

*Note: If future wells are planned and no API number is available please list as PLANNED.
If there are existing wells that commenced construction prior to August 23, 2011, please acknowledge as existing.*

This is the same API (American Petroleum Institute) well number(s) provided in the well completion notification and as provided to the WVDEP, Office of Oil and Gas for the well permit. The API number may be provided on the application without the state code (047).

Every oil and gas well permitted in West Virginia since 1929 has been issued an API number. This API is used by agencies to identify and track oil and gas wells.

*The API number has the following format: 047-001-00001
Where,
047 = State code. The state code for WV is 047.
001 = County Code. County codes are odd numbers, beginning with 001 (Barbour) and continuing to 109 (Wyoming).
00001= Well number. Each well will have a unique well number.*

ATTACHMENT L – STORAGE VESSEL DATA SHEET

Complete this data sheet if you are the owner or operator of a storage vessel that contains condensate and/or produced water. This form must be completed for *each* new or modified bulk liquid storage vessel(s) that contains condensate and/or produced water . (If you have more than one (1) identical tank (i.e. 4-400 bbl condensate tanks), then you can list all on one (1) data sheet). **Include gas sample analysis, flashing emissions, working and breathing losses, USEPA Tanks, simulation software (ProMax, E&P Tanks, HYSYS, etc.), and any other supporting documents where applicable.**

The following information is REQUIRED:

- Composition of the representative sample used for the simulation
- For each stream that contributes to flashing emissions:
 - Temperature and pressure (inlet and outlet from separator(s))
 - Simulation-predicted composition
 - Molecular weight
 - Flow rate
- Resulting flash emission factor or flashing emissions from simulation
- Working/breathing loss emissions from tanks and/or loading emissions if simulation is used to quantify those emissions

Additional information may be requested if necessary.

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name QUALITY RECLAMATION PRODUCED WATER TANK BATTERY	2. Tank Name [2S -PW TK 1-6]
3. Emission Unit ID number [2S -PW TK 1-6]	4. Emission Point ID number [2E -PW TK 1-6]
5. Date Installed , Modified or Relocated (<i>for existing tanks</i>) Was <input checked="" type="checkbox"/> the tank m <input type="checkbox"/> anufactured after August 23, 2011?	6. Type of change: <input checked="" type="checkbox"/> New construction <input type="checkbox"/> New stored material <input type="checkbox"/> <input type="checkbox"/> Other Relocation
7A. Description of Tank Modification (<i>if applicable</i>) NA	
7B. Will more than one material be stored in this tank? <i>If so, a separate form must be completed for each material.</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
7C. Was USEPA Tanks simulation software utilized? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
PROMAX AP-42 TANK LOSSES STENCIL WAS USED TO DETERMINE TANK EMISSIONS, PLEASE REFER TO THE ATTACHED PROMAX REPORT.	
<p><i>If Yes, please provide the appropriate documentation and items 8-42 below are not required.</i></p>	

**ATTACHMENT M – SMALL HEATERS AND REBOILERS NOT SUBJECT TO
40CFR60 SUBPART DC
DATA SHEET**

Complete this data sheet for each small heater and reboiler not subject to 40CFR60 Subpart Dc at the facility. *The Maximum Design Heat Input (MDHI) must be less than 10 MMBTU/hr.*

Emission Unit ID# ¹	Emission Point ID# ²	Emission Unit Description (manufacturer, model #)	Year Installed/Modified	Type ³ and Date of Change	Maximum Design Heat Input (MMBTU/hr) ⁴	Fuel Heating Value (BTU/scf) ⁵
1S -GPU(a) 1	1E -GPU(a) 1	GAS PRODUCTION UNITS	2012	EXISTING	1.00	905
1S -GPU(a) 2	1E -GPU(a) 2	GAS PRODUCTION UNITS	TBD	NEW	1.00	905
1S -GPU(a) 3	1E -GPU(a) 3	GAS PRODUCTION UNITS	TBD	NEW	1.00	905
1S -GPU(b) 4	1E -GPU(b) 4	GAS PRODUCTION UNITS	TBD	NEW	1.50	905

ATTACHMENT O – TANKER TRUCK LOADING DATA SHEET

Emission Unit ID#:	[3S -TLPW 1]	Emission Point ID#:	[3E -TLPW 1]	Year Installed/Modified:	2012
Emission Unit Description: Produced Water Loadout					
Loading Area Data					
Number of Pumps:	1	Number of Liquids Loaded:	1	Max number of trucks loading at one (1) time:	1
Are tanker trucks pressure tested for leaks at this or any other location? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Required					
If Yes, Please describe:					
Provide description of closed vent system and any bypasses.					
NA					
Are any of the following truck loadout systems utilized?					
<input type="checkbox"/> Closed System to tanker truck passing a MACT level annual leak test?					
<input type="checkbox"/> Closed System to tanker truck passing a NSPS level annual leak test?					
<input type="checkbox"/> Closed System to tanker truck not passing an annual leak test and has vapor return?					
Projected Maximum Operating Schedule (for rack or transfer point as a whole)					
Time	Jan – Mar	Apr - Jun	Jul – Sept	Oct - Dec	
Hours/day	24	24	24	24	
Days/week	7	7	7	7	
Bulk Liquid Data (use extra pages as necessary)					
Liquid Name	Produced Water				
Max. Daily Throughput (1000 gal/day)	21.00				
Max. Annual Throughput (1000 gal/yr)	7,665				
Loading Method ¹	SUB				
Max. Fill Rate (gal/min)	77				
Average Fill Time (min/loading)	60				
Max. Bulk Liquid Temperature (°F)	57				
True Vapor Pressure ²	11.24				
Cargo Vessel Condition ³	U				
Control Equipment or Method ⁴	NONE				
Max. Collection Efficiency (%)	0%				
Max. Control Efficiency (%)	0%				
Max.VOC Emission Rate	Loading (lb/hr)	1.32E-03			
	Annual (ton/yr)	1.08E-03			
Max.HAP Emission Rate	Loading (lb/hr)	8.78E-06			
	Annual (ton/yr)	7.18E-06			
Estimation Method ⁵	EPA / PROMAX				

**ATTACHMENT Q – PNEUMATIC CONTROLLERS
DATA SHEET**

Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after August 23, 2011?

Yes No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after August 23, 2011?

Yes No

Please list approximate number.

QUALITY RECLAMATION
Registration

ATTACHMENT T

SUPPORTING CALCULATIONS

QUALITY RECLAMATION-MRN-PAD1
GPU Detail Sheet

Equipment ID [1S -GPU(a) 1-3]
 Equipment Count 3
 Equipment Usage 1.00 MMBtu/hr GPU(s)
 Fuel Heating Value 905 Btu/scf
 Design Heat Rate* 1.00 MMBtu/hr
 Site Heat Rate* 3.00 MMBtu/hr
 Potential Operation 8760 hr/yr
 Potential Fuel Usage 29.04 MMscf/yr

* These are heat release rates and not the duty for the heater

Potential Emissions

Pollutant	Emission Factor (lb/MMscf)	Nominal Rating (MMBtu/hr)	Hrs of Operation (hrs/yr)	Estimated Emissions		Source of Emission Factor
				(lb/hr)	(tpy)	
NOx	100.00	3.000	8760	0.33	1.45	AP-42 ¹
CO	84.00	3.000	8760	0.28	1.22	AP-42 ¹
VOC	5.50	3.000	8760	0.02	0.08	AP-42 ²
SO2	0.60	3.000	8760	0.00	0.01	AP-42 ²
PM10	7.60	3.000	8760	0.03	0.11	AP-42 ²
Benzene	0.002	3.000	8760	0.00	3.05E-05	AP-42 ³
Toluene	0.003	3.000	8760	0.00	4.94E-05	AP-42 ³
Ethylbenzene	0.000	3.000	8760	0.00	0.00E+00	
Xylenes	0.000	3.000	8760	0.00	0.00E+00	
N-Hexane	1.80	3.000	8760	0.01	2.61E-02	AP-42 ³
224-TMP	0.00	3.000	8760	0.00	0.00E+00	
Formaldehyde	0.08	3.000	8760	0.00	1.09E-03	AP-42 ³
Total HAPs	1.89	3.000	8760	0.01	2.74E-02	AP-42 ³
CO ₂	120000.00	3.000	8760	397.79	1742.32	AP-42 ²
CH ₄	2.30	3.000	8760	0.01	0.03	AP-42 ²
CO ₂ e					1743.02	

¹ EPA AP-42, Volume I, Fifth Edition - July 1998, Table 1.4-1, Emission Factors for Nitrogen Oxides (NOx) and Carbon Monoxide (CO) from Natural Gas Combustion

² EPA AP-42, Volume I, Fifth Edition - July 1998, Table 1.4-2, Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

³ EPA AP-42, Volume I, Fifth Edition - July 1998, Table 1.4-3, Emission Factors for Speciated Organic Compounds from Natural Gas Combustion

QUALITY RECLAMATION-MRN-PAD1
GPU Detail Sheet

Equipment ID [1S -GPU(b) 4]
 Equipment Count 1
 Equipment Usage 1.50 MMBtu/hr GPU(s)
 Fuel Heating Value 905 Btu/scf
 Design Heat Rate* 1.50 MMBtu/hr
 Site Heat Rate* 1.50 MMBtu/hr
 Potential Operation 8760 hr/yr
 Potential Fuel Usage 14.52 MMscf/yr

* These are heat release rates and not the duty for the heater

Potential Emissions

Pollutant	Emission Factor (lb/MMscf)	Nominal Rating (MMBtu/hr)	Hrs of Operation (hrs/yr)	Estimated Emissions		Source of Emission Factor
				(lb/hr)	(tpy)	
NOx	100.00	1.500	8760	0.17	0.73	AP-42 ¹
CO	84.00	1.500	8760	0.14	0.61	AP-42 ¹
VOC	5.50	1.500	8760	0.01	0.04	AP-42 ²
SO2	0.60	1.500	8760	0.00	0.00	AP-42 ²
PM10	7.60	1.500	8760	0.01	0.06	AP-42 ²
Benzene	0.002	1.500	8760	0.00	0.0000	AP-42 ³
Ethylbenzene	0.000	1.500	8760	0.00	0.0000	
Toluene	0.003	1.500	8760	0.00	0.0000	AP-42 ³
Xylenes	0.000	1.500	8760	0.00	0.0000	
N-Hexane	1.80	1.500	8760	0.00	0.0131	AP-42 ³
224-TMP	0.00	1.500	8760	0.00	0.0000	
Formaldehyde	0.08	1.500	8760	0.00	0.0005	AP-42 ³
Total HAPs	1.89	1.500	8760	0.00	0.01	AP-42 ³
CO ₂	120000.00	1.500	8760	198.90	871.16	AP-42 ²
CH ₄	2.30	1.500	8760	0.00	0.02	AP-42 ²
CO ₂ e					871.51	

¹ EPA AP-42, Volume I, Fifth Edition - July 1998, Table 1.4-1, Emission Factors for Nitrogen Oxides (NOx) and Carbon Monoxide (CO) from Natural Gas Combustion

² EPA AP-42, Volume I, Fifth Edition - July 1998, Table 1.4-2, Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

³ EPA AP-42, Volume I, Fifth Edition - July 1998, Table 1.4-3, Emission Factors for Speciated Organic Compounds from Natural Gas Combustion

Produced Water

QUALITY RECLAMATION
Tank Detail Sheet

Source ID Number [2S -PW TK 1-6]
 Equipment ID PW TK
 Tank Description Produced Water Storage Tanks
 Tank Usage Produced Water
 Tank Count 6
 Tank Capacity 400 bbl
 Tank Contents Produced Water
 Emission Controls NONE
 Tank Orientation Vertical, above ground
 Shell Height / Length 20 ft
 Shell Diameter 12 ft
 Roof Slope 0.0625 ft
 Roof Type Cone
 Tank Construction Welded (Welded, Bolted, Fiberglass)
 Roof color & condition White, good (eg. light brown, good)
 shell color & condition White, good (eg. white, fair)
 FR Primary Seal N/A
 FR Secondary Seal N/A
 Vent pressure setting 0.5 +/- psig
 VOC Control Efficiency 0%
 Hours of operation 8760 hr/yr
 Water Production 182,500.00 bbl/yr
 Water Production 500.00 bbl/day
 Oil in water 0.00 % Oil
 Oil in water 0 bbl/yr Oil

Potential Tank Emissions

Pollutant		Hrs of Operation (hrs/yr)	Estimated Emissions ¹		Source of Emission Factor
			(lb/hr)	(tpy)	
VOC	Flash	8760	1.41E-02	6.19E-02	ProMax
VOC	W&B	8760	2.58E-04	1.13E-03	ProMax
Total		8760	1.44E-02	6.30E-02	
CH ₄	W,B & Flash	8760	3.66E+00	1.60E+01	ProMax
HAPS	Flash	8760	4.97E-04	2.18E-03	ProMax
	Benzene Flash	8760	0.00E+00	0.00E+00	ProMax
	Toluene Flash	8760	0.00E+00	0.00E+00	ProMax
	Ethylbenzene Flash	8760	0.00E+00	0.00E+00	ProMax
	Xylenes Flash	8760	0.00E+00	0.00E+00	ProMax
	n-Hexane Flash	8760	4.97E-04	2.18E-03	ProMax
HAPS	W&B	8760	1.71E-06	7.50E-06	ProMax
	Benzene W&B	8760	0.00E+00	0.00E+00	ProMax
	Toluene W&B	8760	0.00E+00	0.00E+00	ProMax
	Ethylbenzene W&B	8760	0.00E+00	0.00E+00	ProMax
	Xylenes W&B	8760	0.00E+00	0.00E+00	ProMax
	n-Hexane W&B	8760	1.71E-06	7.50E-06	ProMax

Potential Loading Emissions

Pollutant		Hrs of Operation (hrs/yr)	Uncontrolled		Source of Emission Factor
			(lb/hr)	(tpy)	
VOC	Loading	8760	1.32E-03	1.08E-03	ProMax
CH ₄	Loading	8760	6.29E-02	2.76E-01	ProMax
TOTAL HAPS	Loading	8760	8.78E-06	7.18E-06	ProMax
	Benzene Loading	8760	0.00E+00	0.00E+00	ProMax
	Toluene Loading	8760	0.00E+00	0.00E+00	ProMax
	Ethylbenzene Loading	8760	0.00E+00	0.00E+00	ProMax
	Xylenes Loading	8760	0.00E+00	0.00E+00	ProMax
	n-Hexane Loading	8760	8.78E-06	7.18E-06	ProMax

Produced Water

Flashing Emissions Report

Annual Emissions

Tank flashed at the stream
temperature (56.81 °F) and the

Components	Flashing Losses (ton/yr)
Mixture	6.19E-02
C3	5.51E-02
iC4	5.47E-04
nC4	4.08E-03
2,2-Dimethylbutane	0.00E+00
iC5	0.00E+00
nC5	0.00E+00
2,2-Dimethylpropane	0.00E+00
Cyclopentane	0.00E+00
2,3-Dimethylbutane	0.00E+00
2-Methylpentane	0.00E+00
3-Methylpentane	0.00E+00
C6	2.18E-03
Methylcyclopentane	0.00E+00
Benzene	0.00E+00
Cyclohexane	0.00E+00
2-Methylhexane	0.00E+00
3-Methylhexane	0.00E+00
2,2,4-Trimethylpentane	0.00E+00
C7	0.00E+00
Methylcyclohexane	0.00E+00
Toluene	0.00E+00
C8	0.00E+00
Ethylbenzene	0.00E+00
m-Xylene	0.00E+00
o-Xylene	0.00E+00
C9	0.00E+00
C10	0.00E+00
C11	0.00E+00
C12	0.00E+00
C13	0.00E+00
C14	0.00E+00
C15	0.00E+00
C16	0.00E+00
C17	0.00E+00
C18	0.00E+00
C19	0.00E+00
C20	0.00E+00
C21	0.00E+00
C22	0.00E+00
C23	0.00E+00
C24	0.00E+00
C25	0.00E+00
C26	0.00E+00
C27	0.00E+00
C28	0.00E+00
C29	0.00E+00
C30	0.00E+00

Produced Water

ProMax AP-42 Emissions Report
Annual Emissions

Vertical Cylinder

Components	Working Losses (ton/yr)	Breathing Losses (ton/yr)	Total Losses (ton/yr)
Mixture	9.34E-04	1.97E-04	1.13E-03
C3	8.63E-04	1.82E-04	1.05E-03
iC4	5.63E-06	1.19E-06	6.82E-06
nC4	5.89E-05	1.24E-05	7.13E-05
2,2-Dimethylbutane	0.00E+00	0.00E+00	0.00E+00
iC5	0.00E+00	0.00E+00	0.00E+00
nC5	0.00E+00	0.00E+00	0.00E+00
2,2-Dimethylpropane	0.00E+00	0.00E+00	0.00E+00
Cyclopentane	0.00E+00	0.00E+00	0.00E+00
2,3-Dimethylbutane	0.00E+00	0.00E+00	0.00E+00
2-Methylpentane	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	0.00E+00	0.00E+00	0.00E+00
C6	6.20E-06	1.30E-06	7.50E-06
Methylcyclopentane	0.00E+00	0.00E+00	0.00E+00
Benzene	0.00E+00	0.00E+00	0.00E+00
Cyclohexane	0.00E+00	0.00E+00	0.00E+00
2-Methylhexane	0.00E+00	0.00E+00	0.00E+00
3-Methylhexane	0.00E+00	0.00E+00	0.00E+00
2,2,4-Trimethylpentane	0.00E+00	0.00E+00	0.00E+00
C7	0.00E+00	0.00E+00	0.00E+00
Methylcyclohexane	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00
C8	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00
m-Xylene	0.00E+00	0.00E+00	0.00E+00
o-Xylene	0.00E+00	0.00E+00	0.00E+00
C9	0.00E+00	0.00E+00	0.00E+00
C10	0.00E+00	0.00E+00	0.00E+00
C11	0.00E+00	0.00E+00	0.00E+00
C12	0.00E+00	0.00E+00	0.00E+00
C13	0.00E+00	0.00E+00	0.00E+00
C14	0.00E+00	0.00E+00	0.00E+00
C15	0.00E+00	0.00E+00	0.00E+00
C16	0.00E+00	0.00E+00	0.00E+00
C17	0.00E+00	0.00E+00	0.00E+00
C18	0.00E+00	0.00E+00	0.00E+00
C19	0.00E+00	0.00E+00	0.00E+00
C20	0.00E+00	0.00E+00	0.00E+00
C21	0.00E+00	0.00E+00	0.00E+00
C22	0.00E+00	0.00E+00	0.00E+00
C23	0.00E+00	0.00E+00	0.00E+00
C24	0.00E+00	0.00E+00	0.00E+00
C25	0.00E+00	0.00E+00	0.00E+00
C26	0.00E+00	0.00E+00	0.00E+00
C27	0.00E+00	0.00E+00	0.00E+00
C28	0.00E+00	0.00E+00	0.00E+00
C29	0.00E+00	0.00E+00	0.00E+00
C30	0.00E+00	0.00E+00	0.00E+00

Produced Water

ProMax Loading Losses Report
Annual Emissions

Tank Truck or Rail Tank Car with Submerged Loading: Dedicated Normal Service

Components	Annual Loading Losses (t/yr)	Max. Hourly Loading Losses (lb/hr)
Mixture	1.08E-03	1.32E-03
C3	1.00E-03	1.22E-03
iC4	6.53E-06	7.98E-06
nC4	6.83E-05	8.35E-05
2,2-Dimethylbutane	0.00E+00	0.00E+00
iC5	0.00E+00	0.00E+00
nC5	0.00E+00	0.00E+00
2,2-Dimethylpropane	0.00E+00	0.00E+00
Cyclopentane	0.00E+00	0.00E+00
2,3-Dimethylbutane	0.00E+00	0.00E+00
2-Methylpentane	0.00E+00	0.00E+00
3-Methylpentane	0.00E+00	0.00E+00
C6	7.18E-06	8.78E-06
Methylcyclopentane	0.00E+00	0.00E+00
Benzene	0.00E+00	0.00E+00
Cyclohexane	0.00E+00	0.00E+00
2-Methylhexane	0.00E+00	0.00E+00
3-Methylhexane	0.00E+00	0.00E+00
2,2,4-Trimethylpentane	0.00E+00	0.00E+00
C7	0.00E+00	0.00E+00
Methylcyclohexane	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00
C8	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00
m-Xylene	0.00E+00	0.00E+00
o-Xylene	0.00E+00	0.00E+00
C9	0.00E+00	0.00E+00
C10	0.00E+00	0.00E+00
C11	0.00E+00	0.00E+00
C12	0.00E+00	0.00E+00
C13	0.00E+00	0.00E+00
C14	0.00E+00	0.00E+00
C15	0.00E+00	0.00E+00
C16	0.00E+00	0.00E+00
C17	0.00E+00	0.00E+00
C18	0.00E+00	0.00E+00
C19	0.00E+00	0.00E+00
C20	0.00E+00	0.00E+00
C21	0.00E+00	0.00E+00
C22	0.00E+00	0.00E+00
C23	0.00E+00	0.00E+00
C24	0.00E+00	0.00E+00
C25	0.00E+00	0.00E+00
C26	0.00E+00	0.00E+00
C27	0.00E+00	0.00E+00
C28	0.00E+00	0.00E+00
C29	0.00E+00	0.00E+00
C30	0.00E+00	0.00E+00

**QUALITY RECLAMATION
FUGITIVE UNPAVED HAUL ROAD EMISSIONS**

Facility Data

Vehicle type	Light Vehicles	Medium Trucks	Heavy Trucks
Average vehicle weight ((empty+full)/2) (tons)	2	15	23.5
Number of wheels per vehicle (w)	4	10	18
Average number of round trips/day/vehicle type	2	2	0
Distance per round trip (miles/trip)	1.61	1.61	1.61
Vehicle miles traveled (miles/day)	3.22	3.22	0.02
Number of days operations (days/yr)	365	365	365
Vehicle miles travelled VMT (miles/year)	1175.19	1175.19	7.47
Average vehicle speed (mph)	10	10	10
Average number of round trips/hour/vehicle type	0.08	0.08	0.00
Average number of round trips/year/vehicle type	730.00	730.00	4.64
Estimated maximum number of round trips/hour/vehicle type	3	3	1
Estimated maximum number of round trips/day/vehicle type	6	4	10
Estimated maximum number of round trips/year/vehicle type	2190	1460	5

190 Average Tanker Volume (bbl)
7980 Gallons tanker volume
2.416986 BWPD
0 BOPD
0.01 Tanker Trucks Per Day
3700 Length Lease Road (ft)
550 Longest Pad Side (ft)
8500 Total Round Trip (ft)

$$E = k(s/12)a * (W/3)b * ((365-P) / 365)$$

where:

Days per year

Annual average hours per day of road operations

k = PM Particle Size Multiplier

k = PM₁₀ Particle Size Multiplier

k = PM_{2.5} Particle Size Multiplier

s = Surface Material Silt Content

P = Number of days > 0.01 inch of rain

a = PM Constant

a = PM₁₀ & PM_{2.5} Constant

b = PM, PM₁₀, & PM_{2.5} Constant

Total hourly fleet miles travelled (miles/hr)

Total annual fleet vehicle miles travelled (miles/yr)³

Average Wheels⁴

Average vehicle weight of the fleet (W)⁵

Moisture Ratio

Control Efficiency (CF)

Reference : AP-42, Section 13.2.2 (11/06), Equation 1a and 2

Rate Units Comment

365

18

4.9 lb/VMT AP-42 Section 13.2.2 (11/06), Table 13.2.2-2 (PM)

1.5 lb/VMT AP-42 Section 13.2.2 (11/06), Table 13.2.2-2 (PM10)

0.15 lb/VMT AP-42 Section 13.2.2 (11/06), Table 13.2.2-2 (PM2.5)

3.9 % % State Default Data from AP-42 Data (1999 NEI Data)

150 days/yr AP-42 Section 13.2.2 (11/06), Figure 13.2.2-1

0.7 unitless AP-42 Section 13.2.2 (11/06), Table 13.2.2-2 (PM)

0.9 unitless AP-42 Section 13.2.2 (11/06), Table 13.2.2-2 (PM10 & PM2.5)

0.45 unitless AP-42 Section 13.2.2 (11/06), Table 13.2.2-2

0.27 VMT/hr

2,357.85 VMT/yr

10.67

16 tons

1

0.00% %

Estimated based on 0.2% uncontrolled surface water content assuming no watering EPA - BID Document 13.2.2 - 1998

Based on Moisture Ratio and Figure 13.2.2-2 Control

Vehicle Type	Emission Factors			Control Efficiency	Total Vehicle Miles Travelled		Uncontrolled Emission Rates			Uncontrolled Emission Rates		
	PM	PM ₁₀	PM _{2.5}		Total PM	Total PM ₁₀	Total PM _{2.5}	Total PM	Total PM ₁₀	Total PM _{2.5}		
	(lbs/VMT)	(lbs/VMT)	(lbs/VMT)		(lb/hr)	(lb/hr)	(lb/hr)	(tpy)	(tpy)	(tpy)		
Light Vehicles	1.10	0.27	0.03	0.00%	0.134154	1175.189	0.1469	0.035917	0.003592	0.643423	0.157314	0.015731
Medium Trucks	2.71	0.66	0.07	0.00%	0.134154	1175.189	0.363748	0.088935	0.008893	1.593215	0.389535	0.038953
Heavy Trucks	3.32	0.81	0.08	0.00%	0.000853	7.474781	0.002832	0.000692	6.92E-05	0.012402	0.003032	0.000303
Total =					0.269161	2357.854	0.51348	0.125544	0.012554	2.249041	0.549882	0.054988

QUALITY RECLAMATION
Equipmentt Component Fugitives Estimate

	Counts	Emission Factor ¹ lb/hr/ component	% Control Efficiency	% VOC	VOC Emissions		Benzene	Toluene	E-benzene	Xylene	n-Hexane	%CH4	CH4 Emissions		CO ₂ e	
					lb/hr	tpy	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr		lb/hr	tpy	tpy	
Valve																
Gas/Vapor	36	0.00992	0	17	0.06	0.27	0.07	0.15	0.02	0.24	5.22	94.13	0.34	1.47	36.81	
Light Liquid	0	0.00551	0	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Water/Oil	24	0.000216	0	50	0.00	0.01	0.05	0.28	0.07	0.52	0.35	1.00	0.00	0.00	0.01	
Pumps Seals																
Light Liquid	0	0.02866	0	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Water/Oil	0	0.0000529	0	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	
Flanges																
Gas/Vapor	150	0.00086	0	17	0.02	0.10	0.03	0.06	0.01	0.09	1.89	94.13	0.12	0.53	13.30	
Light Liquid	0	0.000243	0	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Water/Oil	20	0.0000617	0	50	0.00	0.00	0.00	0.01	0.00	0.01	0.01	1.00	0.00	0.00	0.00	
Open-Ended Lines																
Gas/Vapor	2	0.00441	0	17	0.00	0.01	0.00	0.00	0.00	0.01	0.13	94.13	0.01	0.04	0.91	
Light Liquid	0	0.00309	0	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Water/Oil	0	0.0006	0	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	
Other																
Gas/Vapor	6	0.0194	0	17	0.02	0.09	0.02	0.05	0.01	0.08	1.70	94.13	0.11	0.48	12.00	
Light Liquid	0	0.0165	0	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Water/Oil	8	0.0309	0	50	0.12	0.54	2.49	13.32	3.25	25.01	16.48	1.00	0.00	0.01	0.27	
Connectors																
Gas/Vapor	100	0.000441	0	17	0.01	0.03	0.01	0.02	0.00	0.03	0.65	94.13	0.04	0.18	4.55	
Light Liquid	0	0.000463	0	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Water/Oil	56	0.000243	0	50	0.01	0.03	0.14	0.73	0.18	1.38	0.91	1.00	0.00	0.00	0.01	
Total Emissions					0.24	1.07	2.81	14.62	3.53	27.37	27.33		0.62	2.71	67.85	

Note

1. Factors from EPA Document EPA-453/R-95-017, November 1995.

Emission Summary Sheet

Emission Unit ID Number	Source Description	NOx		CO		VOC		SOx		PM		PM10	
		TPY	LB/HR	TPY	LB/HR	TPY	LB/HR	TPY	LB/HR	TPY	LB/HR	TPY	LB/HR
[FUGITIVES]	Equipment Component Fugitives Estin	---	---	---	---	1.07	0.24	---	---	2.25	0.51	0.55	0.13
[1S -GPU(a) 1-3]	1.00 MMBtu/hr GPU(s)	1.45	0.33	1.22	0.28	0.08	0.02	0.01	0.00	0.11	0.03	0.11	0.03
[1S -GPU(b) 4]	1.50 MMBtu/hr GPU(s)	0.73	0.17	0.61	0.14	0.04	0.01	0.00	0.00	0.06	0.01	0.06	0.01
[2S -PW TK 1-6]	Produced Water Storage Tanks	---	---	---	---	0.06	0.01	---	---	---	---	---	---
[3S -TLPW 1]	Produced Water Loading	---	---	---	---	0.06	0.01	---	---	---	---	---	---
Total		2.18	0.50	1.83	0.42	1.32	0.30	0.01	0.00	2.41	0.55	0.72	0.16
Total Lb/day		11.93		10.02		7.21		0.07		13.23		3.92	

Emission Unit ID Number	Source Description	Benzene		Toluene		Ethylbenzene		Xylenes		n-Hexane		Formaldehyde	
		TPY	LB/HR	TPY	LB/HR	TPY	LB/HR	TPY	LB/HR	TPY	LB/HR	TPY	LB/HR
[FUGITIVES]	Equipment Component Fugitives Estin	1.41E-03	3.21E-04	7.31E-03	1.67E-03	1.76E-03	4.03E-04	1.37E-02	3.12E-03	1.37E-02	3.12E-03	---	---
[1S -GPU(a) 1-3]	1.00 MMBtu/hr GPU(s)	3.05E-05	6.96E-06	4.94E-05	1.13E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.61E-02	5.97E-03	1.09E-03	2.49E-04
[1S -GPU(b) 4]	1.50 MMBtu/hr GPU(s)	1.52E-05	3.48E-06	2.47E-05	5.64E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.31E-02	2.98E-03	5.44E-04	1.24E-04
[2S -PW TK 1-6]	Produced Water Storage Tanks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.18E-03	4.99E-04	---	---
[3S -TLPW 1]	Produced Water Loading	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.18E-06	8.78E-06	---	---
Total		0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.06	0.01	0.00	0.00
Total Lb/day		0.01		0.04		0.01		0.07		0.30		0.01	

Process Streams	Gas	GPU Gas	H2O	Produced Water	Sales Gas	Water Tank Vapors	40
Composition	Status: Control	Status: Control	Status: Control	Status: Control	Status: Control	Status: Control	Status: Control
Phase: Vapor	From Block: --	GPU	--	Water Tanks	MIX-101	Water Tanks	MIX-102
To Block:	MIX-100	MIX-101	MIX-100	--	--	--	Water Tanks
Mass Fraction	%	%	%	%	%	%	%
H2S	0"	0	0"	0	0	0	0
N2	0.438153*	0.437379	0"	2.29956E-06	0.437379	0.213657	0.000119797
CO2	0.369421*	0.368311	0"	0.00154258	0.368311	3.63500	0.00354060
C1	93.6823*	93.5138	0"	0.00189993	93.5138	85.9005	0.0491350
C2	4.9824*	4.89932	0"	0.000176470	4.89932	5.59046	0.00325053
C3	0.431390*	0.430621	0"	7.00877E-06	0.430621	0.316613	0.000181108
IC4	0.00701992*	0.00700755	0"	4.57609E-08	0.00700755	0.00314674	1.77611E-06
nC4	0.0386095*	0.0385410	0"	4.78225E-07	0.0385410	0.0234698	1.33838E-05
2,2-Dimethylbutane	0"	0	0"	0	0	0	0
IC5	0"	0	0"	0	0	0	0
nC5	0"	0	0"	0	0	0	0
2,2-Dimethylpropane	0"	0	0"	0	0	0	0
Cyclopentane	0"	0	0"	0	0	0	0
2,3-Dimethylbutane	0"	0	0"	0	0	0	0
2-Methylpentane	0"	0	0"	0	0	0	0
3-Methylpentane	0"	0	0"	0	0	0	0
C6	0.124681*	0.124681	0"	5.03794E-08	0.124681	0.0125441	6.94828E-06
Methylcyclopentane	0"	0	0"	0	0	0	0
Benzene	0"	0	0"	0	0	0	0
Cyclohexane	0"	0	0"	0	0	0	0
2-Methylhexane	0"	0	0"	0	0	0	0
3-Methylhexane	0"	0	0"	0	0	0	0
2,2,4-Trimethylpentane	0"	0	0"	0	0	0	0
C7	0"	0	0"	0	0	0	0
Methylcyclohexane	0"	0	0"	0	0	0	0
Toluene	0"	0	0"	0	0	0	0
C8	0"	0	0"	0	0	0	0
Ethylbenzene	0"	0	0"	0	0	0	0
m-Xylene	0"	0	0"	0	0	0	0
o-Xylene	0"	0	0"	0	0	0	0
C9	0"	0	0"	0	0	0	0
C10	0"	0	0"	0	0	0	0
C11	0"	0	0"	0	0	0	0
C12	0"	0	0"	0	0	0	0
C13	0"	0	0"	0	0	0	0
C14	0"	0	0"	0	0	0	0
C15	0"	0	0"	0	0	0	0
C16	0"	0	0"	0	0	0	0
C17	0"	0	0"	0	0	0	0
C18	0"	0	0"	0	0	0	0
C19	0"	0	0"	0	0	0	0
C20	0"	0	0"	0	0	0	0
C21	0"	0	0"	0	0	0	0
C22	0"	0	0"	0	0	0	0
C23	0"	0	0"	0	0	0	0
C24	0"	0	0"	0	0	0	0
C25	0"	0	0"	0	0	0	0
C26	0"	0	0"	0	0	0	0
C27	0"	0	0"	0	0	0	0
C28	0"	0	0"	0	0	0	0
C29	0"	0	0"	0	0	0	0
C30	0"	0	0"	0	0	0	0
H2O	0"	0.180351	100"	99.9984	0.180351	4.30457	99.9438
Oxygen	0"	0	0"	0	0	0	0
Mass Flow	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
H2S	0"	0	0"	0	0	0	0
N2	236.601*	236.593	0"	0.000165513	236.593	0.00846098	0.00082649
CO2	199.486*	199.231	0"	0.111029	199.231	0.143949	0.254978
C1	50588.2*	50584.7	0"	0.136749	50584.7	3.40173	3.53848
C2	2650.44*	2650.20	0"	0.0127016	2650.20	0.221387	0.234088
C3	232.950*	232.937	0"	0.000504482	232.937	0.0125381	0.0130426
IC4	3.79074*	3.79061	0"	3.29368E-06	3.79061	0.000124613	0.000127907
nC4	20.8491*	20.8481	0"	3.44207E-05	20.8481	0.000929423	0.000963843
2,2-Dimethylbutane	0"	0	0"	0	0	0	0
IC5	0"	0	0"	0	0	0	0
nC5	0"	0	0"	0	0	0	0
2,2-Dimethylpropane	0"	0	0"	0	0	0	0
Cyclopentane	0"	0	0"	0	0	0	0
2,3-Dimethylbutane	0"	0	0"	0	0	0	0
2-Methylpentane	0"	0	0"	0	0	0	0
3-Methylpentane	0"	0	0"	0	0	0	0
C6	67.4444*	67.4439	0"	3.62603E-06	67.4439	0.000496758	0.000500384
Methylcyclopentane	0"	0	0"	0	0	0	0
Benzene	0"	0	0"	0	0	0	0
Cyclohexane	0"	0	0"	0	0	0	0
2-Methylhexane	0"	0	0"	0	0	0	0
3-Methylhexane	0"	0	0"	0	0	0	0
2,2,4-Trimethylpentane	0"	0	0"	0	0	0	0
C7	0"	0	0"	0	0	0	0
Methylcyclohexane	0"	0	0"	0	0	0	0
Toluene	0"	0	0"	0	0	0	0
C8	0"	0	0"	0	0	0	0
C10	0"	0	0"	0	0	0	0
C12	0"	0	0"	0	0	0	0
C13	0"	0	0"	0	0	0	0
C14	0"	0	0"	0	0	0	0
C15	0"	0	0"	0	0	0	0
C19	0"	0	0"	0	0	0	0
C28	0"	0	0"	0	0	0	0
C29	0"	0	0"	0	0	0	0
C30	0"	0	0"	0	0	0	0
H2O	0"	97.5576	7295.05*	7197.32	97.5576	0.170464	7197.49
Oxygen	0"	0	0"	0	0	0	0

Process Streams	Gas	GPU Gas	H2O	Produced Water	Sales Gas	Water Tank Vapors	40
Properties	Status: Calculated	Status: Calculated	Status: Calculated	Status: Calculated	Status: Calculated	Status: Calculated	Status: Calculated
Phase: Vapor	From Block: --	GPU	--	Water Tanks	MIX-101	Water Tanks	MIX-102
	To Block: MIX-100	MIX-101	MIX-100	--	--	--	Water Tanks
Property	Units						
Temperature	°F	110°	85°	110°	85.9594	85	85.9594
Pressure	psig	4000°	384.304	4000°	0.5	384.304	0.5
Mole Fraction Vapor	%	100	100	0	0	100	100
Mole Fraction Light Liquid	%	0	0	100	100	0	0
Mole Fraction Heavy Liquid	%	0	0	0	0	0	0
Molecular Weight	lb/lbmol	16.5592	16.5616	18.0153	18.0154	16.5616	17.0142
Mass Density	lb/ft³	12.0916	1.19684	62.0539	62.1165	1.19684	0.0442571
Molar Flow	lbmol/h	3261.01	3266.19	404.937	399.524	3266.19	0.232751
Mass Flow	lb/h	53969.8	54053.3	7295.05	7197.58	54053.3	3.96008
Vapor Volumetric Flow	ft³/h	4465.90	45196.7	117.550	115.872	45196.7	89.4789
Liquid Volumetric Flow	gpm	556.788	5034.91	14.6558	14.4464	5034.91	11.1558
Std Vapor Volumetric Flow	MMSCFD	29.77	29.7472	3.68801	3.63871	29.7472	0.00211981
Std Liquid Volumetric Flow	sgpm	354.406	354.576	14.5833°	14.3892	354.576	0.0246888
Compressibility		0.899338	0.944586	0.190951	0.000752668	0.944586	0.997689
Specific Gravity		0.571745	0.571827	0.984947	0.959592	0.571827	0.587454
API Gravity				9.52142	10.0023		
Enthalpy	Btu/h	-1.09323E+08	-1.06478E+08	-4.94443E+07	-4.90321E+07	-1.06478E+08	-8601.95
Mass Enthalpy	Btu/lb	-2024.51	-1968.42	-6777.78	-6812.31	-1968.42	-2172.17
Mass Cp	Btu/(lb*°F)	0.810698	0.568927	0.972886	0.981258	0.568927	0.512336
Ideal Gas Cp/Cv Ratio		1.28898	1.29628	1.32384	1.32508	1.29615	1.29615
Dynamic Viscosity	cP	0.0236857	0.0117055	0.662986	0.819996	0.0117055	0.0114344
Kinematic Viscosity	cSt	0.122287	0.610568	0.666983	0.824107	0.610568	16.1291
Thermal Conductivity	Btu/(hr*°F)	0.0433396	0.0208325	0.363956	0.354218	0.0208325	0.0192194
Surface Tension	lb/ft			0.00473609	0.004913097		
Net Ideal Gas Heating Value	Btu/ft³	928.351	926.813	0	0.0211863	926.813	882.885
Net Liquid Heating Value	Btu/lb	21266.2	21226.1	-1059.76	-1059.28	21226.1	19634.6
Gross Ideal Gas Heating Value	Btu/ft³	1030.15	1028.52	50.3101	50.3321	1028.52	981.622
Gross Liquid Heating Value	Btu/lb	23599.1	23556.6	0	0.493547	23556.6	21836.8

Process Streams	Gas	GPU Gas	H2O	Produced Water	Sales Gas	Water Tank Vapors	40
Composition	Status: <small>Selected</small>	Status: <small>Selected</small>	Status: <small>Selected</small>	Status: <small>Selected</small>	Status: <small>Selected</small>	Status: <small>Selected</small>	Status: <small>Selected</small>
Phase: <small>Vapor</small>	From Block: --	GPU	--	Water Tanks	MIX-101	Water Tanks	MIX-102
	To Block: MIX-100	MIX-101	MIX-100	--	--	--	Water Tanks
Mass Fraction	%	%	%	%	%	%	%
H2S	0	0	0	0	0	0	0
N2	0.438153	0.437379			0.437379	0.213657	0.213657
CO2	0.368421	0.368311			0.368311	3.63500	3.63500
C1	93.6823	93.5138			93.5138	85.9005	85.9005
C2	4.90824	4.89932			4.89932	5.59046	5.59046
C3	0.431390	0.430621			0.430621	0.316613	0.316613
iC4	0.00701992	0.00700755			0.00700755	0.00314674	0.00314674
nC4	0.0386095	0.0385410			0.0385410	0.0234698	0.0234698
2,2-Dimethylbutane	0	0			0	0	0
iC5	0	0			0	0	0
nC5	0	0			0	0	0
2,2-Dimethylpropane	0	0			0	0	0
Cyclopentane	0	0			0	0	0
2,3-Dimethylbutane	0	0			0	0	0
2-Methylpentane	0	0			0	0	0
3-Methylpentane	0	0			0	0	0
C6	0.124898	0.124681			0.124681	0.0125441	0.0125441
Methylcyclopentane	0	0			0	0	0
Benzene	0	0			0	0	0
Cyclohexane	0	0			0	0	0
2-Methylhexane	0	0			0	0	0
3-Methylhexane	0	0			0	0	0
2,2,4-Trimethylpentane	0	0			0	0	0
C7	0	0			0	0	0
Methylcyclohexane	0	0			0	0	0
Toluene	0	0			0	0	0
C8	0	0			0	0	0
Ethylbenzene	0	0			0	0	0
m-Xylene	0	0			0	0	0
o-Xylene	0	0			0	0	0
C9	0	0			0	0	0
C10	0	0			0	0	0
C11	0	0			0	0	0
C12	0	0			0	0	0
C13	0	0			0	0	0
C14	0	0			0	0	0
C15	0	0			0	0	0
C16	0	0			0	0	0
C17	0	0			0	0	0
C18	0	0			0	0	0
C19	0	0			0	0	0
C20	0	0			0	0	0
C21	0	0			0	0	0
C22	0	0			0	0	0
C23	0	0			0	0	0
C24	0	0			0	0	0
C25	0	0			0	0	0
C26	0	0			0	0	0
C27	0	0			0	0	0
C28	0	0			0	0	0
C29	0	0			0	0	0
C30	0	0			0	0	0
H2O	0	0.180351			0.180351	4.30457	4.30457
Oxygen	0	0			0	0	0
Mass Flow	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
H2S	0	0			0	0	0
N2	236.601	236.593			236.593	0.00846098	0.00846098
CO2	199.486	199.231			199.231	0.143949	0.143949
C1	50588.2	50584.7			50584.7	3.40173	3.40173
C2	2650.44	2650.20			2650.20	0.221387	0.221387
C3	232.950	232.937			232.937	0.0125381	0.0125381
iC4	3.79074	3.79061			3.79061	0.000124613	0.000124613
nC4	20.8491	20.8481			20.8481	0.000929423	0.000929423
2,2-Dimethylbutane	0	0			0	0	0
iC5	0	0			0	0	0
nC5	0	0			0	0	0
2,2-Dimethylpropane	0	0			0	0	0
Cyclopentane	0	0			0	0	0
2,3-Dimethylbutane	0	0			0	0	0
2-Methylpentane	0	0			0	0	0
3-Methylpentane	0	0			0	0	0
C6	67.4444	67.4439			67.4439	0.000496758	0.000496758
Methylcyclopentane	0	0			0	0	0
Benzene	0	0			0	0	0
Cyclohexane	0	0			0	0	0
2-Methylhexane	0	0			0	0	0
3-Methylhexane	0	0			0	0	0
2,2,4-Trimethylpentane	0	0			0	0	0
C7	0	0			0	0	0
Methylcyclohexane	0	0			0	0	0
Toluene	0	0			0	0	0
C8	0	0			0	0	0
Ethylbenzene	0	0			0	0	0
m-Xylene	0	0			0	0	0
o-Xylene	0	0			0	0	0
C9	0	0			0	0	0
C10	0	0			0	0	0
C11	0	0			0	0	0
C12	0	0			0	0	0
C13	0	0			0	0	0
C14	0	0			0	0	0
C15	0	0			0	0	0
C16	0	0			0	0	0
C17	0	0			0	0	0
C18	0	0			0	0	0
C19	0	0			0	0	0
C20	0	0			0	0	0
C21	0	0			0	0	0
C22	0	0			0	0	0
C23	0	0			0	0	0
C24	0	0			0	0	0
C25	0	0			0	0	0
C26	0	0			0	0	0
C27	0	0			0	0	0
C28	0	0			0	0	0
C29	0	0			0	0	0
C30	0	0			0	0	0
H2O	0	97.5576			97.5576	0.170464	0.170464
Oxygen	0	0			0	0	0

Process Streams	Gas	GPU Gas	H2O	Produced Water	Sales Gas	Water Tank Vapors	40
Properties							
Phase:	Vapor						
Status:	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated
From Block:	--	GPU	--	Water Tanks	MIX-101	Water Tanks	MIX-102
To Block:	MIX-100	MIX-101	MIX-100	--	--	--	Water Tanks
Property	Units						
Temperature	°F	110	85		85	85.9594	85.9594
Pressure	psig	4000	384.304		384.304	0.5	0.5
Mole Fraction Vapor	%	100	100		100	100	100
Mole Fraction Light Liquid	%	0	0		0	0	0
Mole Fraction Heavy Liquid	%	0	0		0	0	0
Molecular Weight	lb/lbmol	16.5692	16.5616		16.5616	17.0142	17.0142
Mass Density	lb/ft³	12.0916	1.19684		1.19684	0.0442571	0.0442571
Molar Flow	lbmol/h	3261.01	3266.19		3266.19	0.232751	0.232751
Mass Flow	lb/h	53999.8	54093.3		54093.3	3.96008	3.96008
Vapor Volumetric Flow	ft³/h	4465.90	45196.7		45196.7	89.4789	89.4789
Liquid Volumetric Flow	gpm	556.788	5634.91		5634.91	11.1558	11.1558
Std Vapor Volumetric Flow	MMSCFD	29.7	29.7472		29.7472	0.00211981	0.00211981
Std Liquid Volumetric Flow	sgpm	354.406	354.576		354.576	0.0246888	0.0246888
Compressibility		0.899339	0.944586		0.944586	0.997689	0.997689
Specific Gravity		0.571745	0.571827		0.571827	0.587454	0.587454
API Gravity							
Enthalpy	Btu/h	-1.09323E+08	-1.06478E+08		-1.06478E+08	-8601.95	-8601.95
Mass Enthalpy	Btu/lb	-3024.51	-1988.42		-1988.42	-2172.17	-2172.17
Mass Cp	Btu/(lb*°F)	0.810698	0.568927		0.568927	0.512336	0.512336
Ideal Gas Cp/Cv Ratio		1.28988	1.29628		1.29628	1.29615	1.29615
Dynamic Viscosity	cP	0.0236857	0.0117055		0.0117055	0.0114344	0.0114344
Kinematic Viscosity	cSt	0.122287	0.610568		0.610568	16.1291	16.1291
Thermal Conductivity	Btu/(ft*h*°F)	0.0433396	0.0208325		0.0208325	0.0192194	0.0192194
Surface Tension	lb/ft						
Net Ideal Gas Heating Value	Btu/ft³	928.351	926.813		926.813	882.885	882.885
Net Liquid Heating Value	Btu/lb	21266.2	21226.1		21226.1	19634.6	19634.6
Gross Ideal Gas Heating Value	Btu/ft³	1030.15	1028.52		1028.52	981.622	981.622
Gross Liquid Heating Value	Btu/lb	23599.1	23556.8		23556.8	21836.8	21836.8

Process Streams	Gas	GPU Gas	H2O	Produced Water	Sales Gas	Water Tank Vapors	40
Composition	Status: <small>Solved</small>	Status: <small>Solved</small>	Status: <small>Solved</small>	Status: <small>Solved</small>	Status: <small>Solved</small>	Status: <small>Solved</small>	Status: <small>Solved</small>
Phase: <small>Light Liquid</small>	From Block: --	GPU	--	Water Tanks	MIX-101	Water Tanks	MIX-102
	To Block:	MIX-100	MIX-101	MIX-100	--	--	Water Tanks
Mass Fraction	%	%	%	%	%	%	%
H2S				0	0		0
N2				0	2.29956E-06		2.29956E-06
CO2				0	0.00154258		0.00154258
C1				0	0.00189993		0.00189993
C2				0	0.000176470		0.000176470
C3				0	7.00877E-06		7.00877E-06
iC4				0	4.57609E-08		4.57609E-08
nC4				0	4.78225E-07		4.78225E-07
2,2-Dimethylbutane				0	0		0
iC5				0	0		0
nC5				0	0		0
2,2-Dimethylpropane				0	0		0
Cyclopentane				0	0		0
2,3-Dimethylbutane				0	0		0
2-Methylpentane				0	0		0
3-Methylpentane				0	0		0
C6				0	5.03794E-08		5.03794E-08
Methylcyclopentane				0	0		0
Benzene				0	0		0
Cyclohexane				0	0		0
2-Methylhexane				0	0		0
3-Methylhexane				0	0		0
2,2,4-Trimethylpentane				0	0		0
C7				0	0		0
Methylcyclohexane				0	0		0
Toluene				0	0		0
C8				0	0		0
Ethylbenzene				0	0		0
m-Xylene				0	0		0
o-Xylene				0	0		0
C9				0	0		0
C10				0	0		0
C11				0	0		0
C12				0	0		0
C13				0	0		0
C14				0	0		0
C15				0	0		0
C16				0	0		0
C17				0	0		0
C18				0	0		0
C19				0	0		0
C20				0	0		0
C21				0	0		0
C22				0	0		0
C23				0	0		0
C24				0	0		0
C25				0	0		0
C26				0	0		0
C27				0	0		0
C28				0	0		0
C29				0	0		0
C30				0	0		0
H2O			100	99.9964			99.9964
Oxygen				0	0		0
Mass Flow	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
H2S				0	0		0
N2				0	0.000165513		0.000165513
CO2				0	0.111029		0.111029
C1				0	0.136749		0.136749
C2				0	0.0127016		0.0127016
C3				0	0.000504482		0.000504482
iC4				0	3.29368E-06		3.29368E-06
nC4				0	3.44207E-05		3.44207E-05
2,2-Dimethylbutane				0	0		0
iC5				0	0		0
nC5				0	0		0
2,2-Dimethylpropane				0	0		0
Cyclopentane				0	0		0
2,3-Dimethylbutane				0	0		0
2-Methylpentane				0	0		0
3-Methylpentane				0	0		0
C6				0	3.62603E-06		3.62603E-06
Methylcyclopentane				0	0		0
Benzene				0	0		0
Cyclohexane				0	0		0
2-Methylhexane				0	0		0
3-Methylhexane				0	0		0
2,2,4-Trimethylpentane				0	0		0
C7				0	0		0
Methylcyclohexane				0	0		0
Toluene				0	0		0
C8				0	0		0
Ethylbenzene				0	0		0
m-Xylene				0	0		0
o-Xylene				0	0		0
C9				0	0		0
C10				0	0		0
C11				0	0		0
C12				0	0		0
C13				0	0		0
C14				0	0		0
C15				0	0		0
C16				0	0		0
C17				0	0		0
C18				0	0		0
C19				0	0		0
C20				0	0		0
C21				0	0		0
C22				0	0		0
C23				0	0		0
C24				0	0		0
C25				0	0		0
C26				0	0		0
C27				0	0		0
C28				0	0		0
C29				0	0		0
C30				0	0		0
H2O			7295.05	7197.32			7197.32
Oxygen				0	0		0

Process Streams	Gas	GPU Gas	H2O	Produced Water	Sales Gas	Water Tank Vapors	40
Properties	Status: Calculated	Status: Calculated	Status: Calculated	Status: Calculated	Status: Calculated	Status: Calculated	Status: Calculated
Phase: Light Liquid	From Block: --	GPU	--	Water Tanks	MIX-101	Water Tanks	MIX-102
	To Block: MIX-100	MIX-101	MIX-100	--	--	--	Water Tanks
Property	Units						
Temperature	°F		110	85.9594			85.9594
Pressure	psig		4000	0.5			0.5
Mole Fraction Vapor	%		0	0			0
Mole Fraction Light Liquid	%		100	100			100
Mole Fraction Heavy Liquid	%		0	0			0
Molecular Weight	lb/lbmol		18.0153	18.0154			18.0154
Mass Density	lb/ft³		62.0539	62.1165			62.1165
Molar Flow	lbmol/h		404.937	399.524			399.524
Mass Flow	lb/h		7295.05	7197.58			7197.58
Vapor Volumetric Flow	ft³/h		117.560	115.872			115.872
Liquid Volumetric Flow	gpm		14.6568	14.4464			14.4464
Std Vapor Volumetric Flow	MMSCFD		3.68801	3.63871			3.63871
Std Liquid Volumetric Flow	sgpm		14.5833	14.3892			14.3892
Compressibility			0.190651	0.000752668			0.000752668
Specific Gravity			0.994947	0.995952			0.995952
API Gravity			9.52142	10.0023			10.0023
Enthalpy	Btu/h		-4.94443E+07	-4.90321E+07			-4.90321E+07
Mass Enthalpy	Btu/lb		-6777.78	-6812.31			-6812.31
Mass Cp	Btu/(lb*°F)		0.972866	0.981258			0.981258
Ideal Gas Cp/Cv Ratio			1.32394	1.32508			1.32508
Dynamic Viscosity	cP		0.662966	0.819096			0.819096
Kinematic Viscosity	cSt		0.666983	0.824107			0.824107
Thermal Conductivity	Btu/(ft*°F)		0.363956	0.354218			0.354218
Surface Tension	lb/ft		0.00473609	0.004913097			0.004913097
Net Ideal Gas Heating Value	Btu/ft³		0	0.0211863			0.0211863
Net Liquid Heating Value	Btu/lb		-1059.76	-1059.28			-1059.28
Gross Ideal Gas Heating Value	Btu/ft³		50.3101	50.3321			50.3321
Gross Liquid Heating Value	Btu/lb		0	0.493547			0.493547

User Value Sets Report

Client Name:	Air Permit	Job:	C:\Users\murrallc\Documents\ProMax Local\QUALITY RECLAMATION 2017-02-14 (CM).pr
Location:	0		
Flowsheet:	Main		

User Value Set 1

User Value [Ambient Temperature]

Parameter	65* °F	Upper Bound	°F
Lower Bound	°F	Enforce Bounds	FALSE

Notes:

Tank 1-6

User Value [BlockReady]

Parameter	1*	Upper Bound	
Lower Bound		Enforce Bounds	FALSE

User Value [ShellLength]

Parameter	20* ft	Upper Bound	ft
Lower Bound	ft	Enforce Bounds	FALSE

User Value [ShellDiam]

Parameter	12* ft	Upper Bound	ft
Lower Bound	ft	Enforce Bounds	FALSE

User Value [BreatherVP]

Parameter	0.0300000* psig	Upper Bound	psig
Lower Bound	psig	Enforce Bounds	FALSE

User Value [BreatherVacP]

Parameter	-0.0300000* psig	Upper Bound	psig
Lower Bound	psig	Enforce Bounds	FALSE

User Value [DomeRadius]

Parameter	ft	Upper Bound	ft
Lower Bound	ft	Enforce Bounds	FALSE

User Value [OpPress]

Parameter	0* psig	Upper Bound	psig
Lower Bound	psig	Enforce Bounds	FALSE

User Value [AvgPercentLiq]

Parameter	50* %	Upper Bound	%
Lower Bound	%	Enforce Bounds	FALSE

User Value [MaxPercentLiq]

Parameter	90* %	Upper Bound	%
Lower Bound	%	Enforce Bounds	FALSE

User Value [AnnNetTP]

Parameter	492.812* bbl/day	Upper Bound	bbl/day
Lower Bound	bbl/day	Enforce Bounds	FALSE

User Value [OREff]			
Parameter	0* %	Upper Bound	%
Lower Bound	%	Enforce Bounds	FALSE
User Value [MaxAvgT]			
Parameter	59.8833* °F	Upper Bound	°F
Lower Bound	°F	Enforce Bounds	FALSE
User Value [MinAvgT]			
Parameter	40.7333* °F	Upper Bound	°F
Lower Bound	°F	Enforce Bounds	FALSE
User Value [BulkLiqT]			
Parameter	50.3283* °F	Upper Bound	°F
Lower Bound	°F	Enforce Bounds	FALSE
User Value [AvgP]			
Parameter	14.1085* psia	Upper Bound	psia
Lower Bound	psia	Enforce Bounds	FALSE
User Value [ThermI]			
Parameter	1202.96* Btu/ft^2/day	Upper Bound	Btu/ft^2/day
Lower Bound	Btu/ft^2/day	Enforce Bounds	FALSE
User Value [AvgWindSpeed]			
Parameter	9.075* mi/h	Upper Bound	mi/h
Lower Bound	mi/h	Enforce Bounds	FALSE
User Value [MaxHourlyLoadingRate]			
Parameter	110* bbl/hr	Upper Bound	bbl/hr
Lower Bound	bbl/hr	Enforce Bounds	FALSE
User Value [EntrainedOilFrac]			
Parameter	1* %	Upper Bound	%
Lower Bound	%	Enforce Bounds	FALSE
User Value [TurnoverRate]			
Parameter	82.6743*	Upper Bound	
Lower Bound		Enforce Bounds	FALSE
User Value [LLossSatFactor]			
Parameter	0.6*	Upper Bound	
Lower Bound		Enforce Bounds	FALSE
User Value [AtmPressure]			
Parameter	14.1085* psia	Upper Bound	psia
Lower Bound	psia	Enforce Bounds	FALSE
User Value [TVP]			
Parameter	10.7698* psia	Upper Bound	psia
Lower Bound	psia	Enforce Bounds	FALSE
User Value [MaxVP]			
Parameter	11.2353* psia	Upper Bound	psia
Lower Bound	psia	Enforce Bounds	FALSE

User Value [MinVP]			
Parameter	10.3090* psia	Upper Bound	psia
Lower Bound	psia	Enforce Bounds	FALSE
User Value [AvgLiqSurfaceT]			
Parameter	51.9351* °F	Upper Bound	°F
Lower Bound	°F	Enforce Bounds	FALSE
User Value [MaxLiqSurfaceT]			
Parameter	56.8136* °F	Upper Bound	°F
Lower Bound	°F	Enforce Bounds	FALSE
User Value [TotalLosses]			
Parameter	0.00113057* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [WorkingLosses]			
Parameter	0.000155660* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [StandingLosses]			
Parameter	3.27684E-05* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [RimSealLosses]			
Parameter	0* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [WithdrawalLoss]			
Parameter	0* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [LoadingLosses]			
Parameter	0.00108247* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [MaxHourlyLoadingLoss]			
Parameter	0.00132393* lb/hr	Upper Bound	lb/hr
Lower Bound	lb/hr	Enforce Bounds	FALSE
User Value [PStar]			
Parameter		Upper Bound	
Lower Bound		Enforce Bounds	FALSE
User Value [AllCTotalLosses]			
Parameter	0.747705* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [AllCLoadingLosses]			
Parameter	0.715894* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [AllCMaxHLoadingLoss]			
Parameter	0.875582* lb/hr	Upper Bound	lb/hr
Lower Bound	lb/hr	Enforce Bounds	FALSE

User Value [AIIcFlashingLosses]			
Parameter	17.4791* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [DeckFittingLosses]			
Parameter	0* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [DeckSeamLosses]			
Parameter	0* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [FlashingLosses]			
Parameter	0.0618869* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [TotalResidual]			
Parameter	31524.5* ton/yr	Upper Bound	ton/yr
Lower Bound	ton/yr	Enforce Bounds	FALSE
User Value [GasMoleWeight]			
Parameter	0.0168657* kg/mol	Upper Bound	kg/mol
Lower Bound	kg/mol	Enforce Bounds	FALSE
User Value [VapReportableFrac]			
Parameter	0.151205* %	Upper Bound	%
Lower Bound	%	Enforce Bounds	FALSE
User Value [LiqReportableFrac]			
Parameter	7.01989E-06* %	Upper Bound	%
Lower Bound	%	Enforce Bounds	FALSE
User Value [FlashReportableFrac]			
Parameter	0.354063* %	Upper Bound	%
Lower Bound	%	Enforce Bounds	FALSE
Notes:			
This User Value Set was programmatically generated. GUID={1166EC9D-8DC5-4DBC-84E5-4BB6464B2309}			

ATTACHMENT V – CLASS I LEGAL ADVERTISEMENT

**AIR QUALITY PERMIT NOTICE
Notice of Application for Permit Application**

Notice is given that SWN Production Company, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for modification under the G70-D for its QUALITY RECLAMATION natural gas and oil production facility located at 413 CHINKS RUN ROAD, RIVERSVILLE in Marion County at latitude -80.15828 and longitude 39.569. From I-79 N take exit 155. Take the ramp right and travel to the junction with route 7 across from Sheetz. Turn left onto route 7. Travel on route 7 until you reach Route 29(Jakes Run). Turn on Jakes Run and travel 8.41 miles to the county line. At the county line the road changes to route 25. Continue 3 miles to County Route 25/5. Turn on 25/5 and go 0.9 miles to the access road on the right.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will now be:

Regulated Pollutant	Potential Annual Emissions in tons per year (tpy)
Carbon Monoxide	1.83
Nitrogen Oxides	2.18
Particulate Matter (PM)	2.41
PM-10	0.72
Sulfur Dioxide	0.01
Total Volatile Organic Compounds	1.32
Total Hazardous Air Pollutants	0.08
Total Carbon Dioxide Equivalent	3,091

Startup of the operation is planned to begin on or about June 4, 2017. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this application for G70-B General Permit Registration should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this, 5-Apr-2017

By: SWN Production Company, LLC
Carla Suszkowski
Regulatory Manager
West Virginia Division
179 Innovation Drive
Jane Lew, WV 26378