# Icon Midstream Pipeline, LLC

## APPLICATION FOR
## NSR (45CSR13)
## CONSTRUCTION PERMIT

### Grumpy Dehydration Facility
### Tyler County, West Virginia

98 Vanadium Road
Bridgeville, PA 15017
(412) 221-1100

# APPLICATION FOR NSR (45CSR13) CONSTRUCTION PERMIT

## Icon Midstream Pipeline, LLC

### Grumpy Dehydration Facility

### Tyler County, West Virginia

**Table of Contents**

# SECTION I

# Application Form

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

**DIVISION OF AIR QUALITY**

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

# *APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)*

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

***FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.***

## *Section I. General*

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
**Icon Midstream Pipeline, LLC**

2. Federal Employer ID No. ***(FEIN):***
**47-1115453**

3. Name of facility *(if different from above):*
Grumpy Dehydration Facility

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
3130 Grants Lake Blvd, Suite 18859

Sugarland, TX 77496

5B. Facility's present physical address:
Off Indian Creek Road

Middlebourne in Tyler County

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

– If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**

– If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: **N/A**

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

– If **YES,** please explain: **Applicant has a lease agreement with the land owner for installation of the facility**

– If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Dehydration facility

10. North American Industry Classification System **(NAICS)** code for the facility:
211111

11A. DAQ Plant ID No. (for existing facilities only):
–

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):

***All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.***

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

**From Middlebourne, proceed south/east on State Route 18 (Main Street) out of town. Proceed approximately 5.8 miles to the junction with CR 1/3 (Indian Creek Road) on the left. From WV 18 and Indian Creek (CR13) intersection, take Indian Creek Rd east for 4.4 miles. Turn left onto lease road, follow north for 1.8 miles to well pad entrance.**

| 12.B. New site address (if applicable): | 12C. Nearest city or town: Middlebourne | 12D. County: Tyler |
|---|---|---|
| 12.E. UTM Northing (KM): 4,368.7 | 12F. UTM Easting (KM): 520.2 | 12G. UTM Zone: 17 |

13. Briefly describe the proposed change(s) at the facility:
**This facility will receive gas from the contiguous Jay-Bee Oil & Gas well pad, dehydrate the gas and inject it into a gather line owned and operated by others. There is no compression at this time.**

| 14A. Provide the date of anticipated installation or change: Upon permit issuance.<br>– If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / / | 14B. Date of anticipated Start-Up if a permit is granted:<br>6/15/16 |
|---|---|

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17. **Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18. **Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

## *Section II. Additional attachments and supporting documents.*

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**
– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

***All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.***

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations
☐ Chemical Processes
☐ Concrete Batch Plant
☐ Grey Iron and Steel Foundry
☐ Haul Road Emissions
☐ Hot Mix Asphalt Plant
☐ Incinerator
☐ Indirect Heat Exchanger
☐ Quarry
☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Storage Tanks
☒ General Emission Unit, specify: **Glycol Dehydration Unit (1) with Reboiler and Still Vent.**

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems
☐ Adsorption Systems
☐ Afterburner
☐ Baghouse
☐ Condenser
☐ Electrostatic Precipitator
☐ Flare
☐ Mechanical Collector
☐ Wet Collecting System
☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

## *Section III. Certification of Information*

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity
☐ Authority of Governmental Agency
☐ Authority of Partnership
☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

***All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.***

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

***Certification of Truth, Accuracy, and Completeness***

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

***Compliance Certification***

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____ *(Please use blue ink)* DATE: 4-4-2016 *(Please use blue ink)*

| | | |
|---|---|---|
| 35B. Printed name of signee: Shane Dowell | | 35C. Title: Operations Manager |
| 35D. E-mail: iconmidstream@gmail.com | 36E. Phone: 304-904-1700 | 36F. FAX: 304-628-3111 |
| 36A. Printed name of contact person (if different from above): | | 36B. Title: |
| 36C. E-mail: | 36D. Phone: | 36E. FAX: |

**PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:**

- ☒ **Attachment A: Business Certificate**
- ☒ **Attachment B: Map(s)**
- ☒ **Attachment C: Installation and Start Up Schedule**
- ☒ **Attachment D: Regulatory Discussion**
- ☒ **Attachment E: Plot Plan**
- ☒ **Attachment F: Detailed Process Flow Diagram(s)**
- ☒ **Attachment G: Process Description**
- ☐ **Attachment H: Material Safety Data Sheets (MSDS)**
- ☒ **Attachment I: Emission Units Table**
- ☒ **Attachment J: Emission Points Data Summary Sheet**
- ☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
- ☒ **Attachment L: Emissions Unit Data Sheet(s)**
- ☐ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☒ **Attachment N: Supporting Emissions Calculations**
- ☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☒ **Attachment P: Public Notice**
- ☐ **Attachment Q: Business Confidential Claims**
- ☐ **Attachment R: Authority Forms**
- ☐ **Attachment S: Title V Permit Revision Information**
- ☒ **Application Fee**

***Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.***

***FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:***

- ☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
- ☐ ***For Title V Administrative Amendments:***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit,***
- ☐ ***For Title V Minor Modifications:***
  - ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  - ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  - ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  - ☐ ***EPA has 45 day review period of a draft permit.***

***All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.***

# SECTION II

# Attachments

# ATTACHMENT A

# Business Certificate

# State of West Virginia

# Certificate

***I, Natalie E. Tennant, Secretary of State,***
***of the State of West Virginia, hereby certify that***

Icon Midstream Pipeline, LLC

has filed the appropriate registration documents in my office according to the provisions of the West Virginia Code and hereby declare the organization listed above as duly registered with the Secretary of State's Office.

***Given under my hand and***
***the Great Seal of West Virginia***
***on this day of***
March 13, 2015

Natalie E Tennant

***Secretary of State***

# ATTACHMENT B

## Area Map


| | |
|---|---|
| DRAWN BY | DJF |
| DATE | 2/22/16 |
| CHECKED BY | RAD |
| SET JOB NO. | 215095 |
| SET DWG FILE | GRUMPY FACm01.dwg |
| DRAWING SCALE | 1"=200' |

SE TECHNOLOGIES

98 Vanadium Road Bridgeville, PA 15017 (412) 221-1100

ICON MIDSTREAM PIPELINE, LLC

GRUMPY DEHYDRATION FACILITY
TYLER COUNTY, WEST VIRGINIA
SITE LOCATION MAP

DRAWING NAME: FIGURE 1

REV. 0

Plot: env045 02/22/2016 12:11 G:\ICON MIDSTREAM, LLC\215095\GRUMPY DEHY FACm01.dwg

# ATTACHMENT C

# Installation and Start-Up Schedule

# Icon Midstream Pipeline, LLC
# Grumpy Dehydration Facility
# Attachment C – Installation and Start-Up Schedule

Installation of the Grumpy Dehydration Facility, emission point S01, will take place upon receipt of approval of this application. Icon will install the equipment and connect to existing gathering lines. It is anticipated that all work can be completed within 30 days of receipt of approval. Start-up of the Facility is anticipated to begin shortly after permit issuance and installation, approximately the 15th day of June, 2016.

# ATTACHMENT D

# Regulatory Discussion

# Icon Midstream Pipeline, LLC

## Grumpy Dehydration Facility
## Attachment D – Regulatory Discussion

Both State and Federal environmental regulations governing air emissions apply to the planned Grumpy Dehydration Facility. The West Virginia Department of Environmental Protection (WVDEP) has been delegated the authority to implement certain federal air quality requirements for the state. Air quality regulations that potentially affect the Facility are discussed herein.

### 1.1 PSD and NSR

The facility will be a minor source with respect to Prevention of Significant Deterioration (PSD) regulations as it will not have the potential to emit more than the annual emission thresholds of any PSD regulated pollutant.

The facility is within an area designated as attainment. Consequently, the facility is not subject to the New Source Review (NSR) regulations.

### 1.2 Title V Operating Permit Program

West Virginia has incorporated provisions of the federal Title V operating permit program. Thresholds for inclusion under the Title V program are 10 tpy of any single Hazardous Air Pollutant (HAP) or 25 tons of any combination of HAP and/or 100 tpy of all other regulated pollutants. Additionally, facilities regulated under certain New Source Performance Standards (NSPS) require facilities to have Title V permits.

The facility will be a minor source. Additionally, the NSPS regulating this facility does not trigger a Title V permit. Hence, a Title V permit will not be required for this facility.

### 1.3 Aggregation

Source aggregation determinations are typically made based on the following criteria:

- Whether the facilities are under common control,
- Whether the facilities belong to the same Major Group (i.e. the first two digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement;
- Whether the facilities are located on one or more contiguous or adjacent properties; and the distance between all pollutant emitting activities,
- Whether the facilities can operate independently

<u>Only if all criteria are met does a permitting authority aggregate the facilities into a single source.</u>

Icon Midstream plans to install its Grumpy Dehydration Facility contiguous with the Jay-Bee Oil & Gas Grumpy Well Pad in Tyler County. The Grumpy Dehydration Facility will receive and manage natural gas from the Grumpy Well Pad, dehydrate the gas and inject into a gathering line owned and operated by others.

There is no gas routed to or received from any other Icon Midstream facility. Hence, no other Icon Midstream facilities in the area should be aggregated with this facility.

The Grumpy Well Pad while under the same general SIC Code, has completely separate ownership (Jay-Bee Oil & Gas) but share common workforces. The facilities do not share common payroll activities. The Grumpy Dehydration Facility supports operation of the Grumpy Well Pad and only exists as a support for gas coming from this well pad. Therefore, emissions from the Grumpy Dehydration Facility should be aggregated with Jay-Bee's Grumpy Well Pad to determine major source status.

## 1.4 New Source Performance Standards

New Source Performance Standards (NSPS) regulations promulgated under 40 CFR 60 require new and reconstructed facilities to control emissions to the level achievable by Best-Available Control Technology (BACT). Specific NSPS requirements potentially applicable to the proposed Facility are as follows:

- 40 CFR 60, Subpart Dc – Standard of Performance for Small Industrial-Commercial Institutional Steam Generating Units
- 40 CFR 60, Subpart OOOO – Standard of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution

### 1.4.1 Subpart Dc

This subpart limits SO2 and PM emissions from boilers and heaters fired by various fuels. While the primary thrust of this set of regulations is to control SOx and PM emissions from coal and oil-fired boilers and heaters, natural gas fired units are also covered under this rule. The planned heater is well below the threshold of coverage for this rule (10 MMBTU/Hr). Thus, this rule does not apply.

### 1.4.2 Subpart OOOO

This Subpart governs emissions from a broad spectrum of operations in the oil and natural gas industries, including operations at processing and fractionation plants. Subpart OOOO is potentially applicable to dehydration units; however, the dehydration unit is exempt from these requirements of per 40 CFR 60.5365(f)(2) because it will not be located at a natural gas processing plant.

## 1.5 National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAPs) promulgated under 40 CFR 63 regulate the emission of Hazardous Air Pollutants (HAPs) from certain industrial processes. In general, these rules apply to major sources of HAPs with a major source being defined as having the potential to emit more than 10 tpy of any individual HAP or 25 tpy of total HAPs. Emissions standards under these rules have been established as the Maximum Achievable Control Technology (MACT) for each source category. The following NESHAP source category standards are potentially applicable to the planned Grumpy Dehydration Facility:

- 40 CFR 63, Subpart HH – National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities
- 40 CFR 63, Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

### 1.5.1 Subpart HH

This Subpart contains MACT standards for major and area source dehydration units located at natural gas production facilities. The proposed equipment for the Facility includes a dehydration unit. Hence, this rule applies.

Exemption criteria are established in 40 CFR 63.764(e)(1). To satisfy the exemption to this subpart, the unit has to satisfy one of the following criteria:
- Annual average flow must be less than 85,000 SCMD (20.0 MMSCFD); or
- Average benzene emissions must be less than 0.9 Mg/yr (1 ton per year).

The average flow through the dehydration unit will exceed 85,000 SCMD; however the potential to emit benzene will be less than 1 ton per year as can be seen in Attachment N; therefore, the dehydration unit is exempt from the requirements of 40 CFR 63 Subpart HH. Although, the dehydration unit is exempt from 40 CFR 63 Subpart HH, records must be maintained of the actual annual benzene emission determination as set forth in 40 CFR 63.774(d)(1).

### 1.5.2 Subpart JJJJJJ

This subpart contains MACT standards for an industrial, commercial, or institutional boiler that is located at an area source of HAPs. This Facility will contain a gas-fired reboiler so it is not subject to this subpart per 40 CFR 63.11195(e).

## 1.6 Chemical Accident Prevention

Subparts B-D of 40 CFR 68 present the requirements for the assessment and subsequent preparation of a Risk Management Plan (RMP) for a facility that stores more than a threshold quantity of a regulated substance listed in 40 CFR 68.130. If a facility stores, handles or processes one or more regulated substances in an amount greater than its corresponding threshold, the facility must prepare and implement an RMP. This permit application proposes to store triethylene glycol which is not a regulated substance per 40 CFR 68.130; therefore, this rule does not apply.

## 1.7 West Virginia State Requirements

### 1.7.1 45 CSR 2

The facility is subject to the opacity requirement of 45 CSR 2. Emissions from the facility cannot exceed 10% over any six minute period.

### 1.7.2 45 CSR 4

This regulation prohibits the emission of objectionable odors. Icon Midstream is obligated to run the station in a manner that does not produce objectionable odors.

### 1.7.3 45 CSR 10

This regulation limits emissions of sulfur oxides. As the sulfur content of the Inlet Gas contains no measurable sulfur, emissions of sulfur oxides is negligible. Thus, while parts of this rule are applicable to the facility, no actions are required on the part of Icon Midstream to attain compliance. The various non-engine combustion units have a design heat input less than 10 MMBTU/Hr and are therefore exempt from the requirements of this rule.

### 1.7.4 45 CSR 13

The state regulations applicable to the permitting of the proposed construction are in Title 45 Series 13 of the Code of State Regulations. The proposed Facility has the potential to emit several regulated pollutants in excess of the thresholds that define a Stationary Source. It will remain less than the thresholds that would classify the facility as a Major Source under 45 CSR 14.

### 1.7.5 45 CSR 16

This series of regulations is an incorporation, by reference, of the New Source Performance Standards (NSPS) codified under 40 CFR 60. As referenced in 1.4 above, the Facility is not subject to NSPS.

### 1.7.6 45 CSR 30

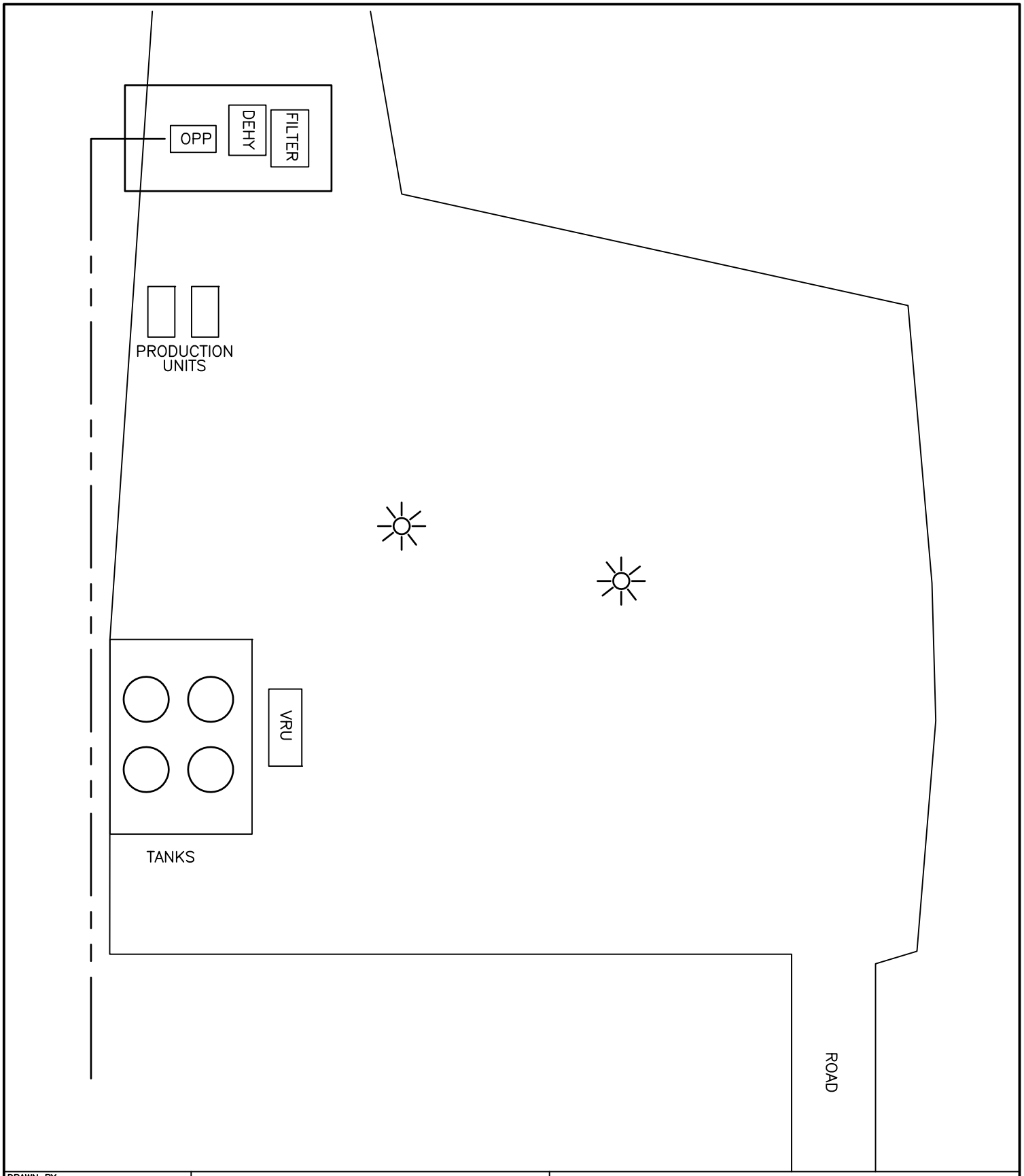
The state regulations applicable to Title V operating permits are in Title 45 Series 30. The Facility, as noted above, does not have the potential to emit any regulated pollutant about the threshold that would define it as a major facility.

### 1.7.7 Other Applicable Requirements

Throughout Series 34, WVDEP has adopted the NESHAPs for Source Categories. NESHAPs have been discussed above.

# ATTACHMENT E

## Plot Plan

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| DATE | 2/22/16 |
| CHECKED BY | RAD |
| SET JOB NO. | 215095 |
| SET DWG FILE | GRUMPYa01.dwg |
| DRAWING SCALE | N.T.S. |

TECHNOLOGIES

98 Vanadium Road Bridgeville, PA 15017 (412) 221-1100

ICON MIDSTREAM PIPELINE, LLC

GRUMPY DEHYDRATION FACILITY
TYLER COUNTY, WEST VIRGINIA
SITE LAYOUT

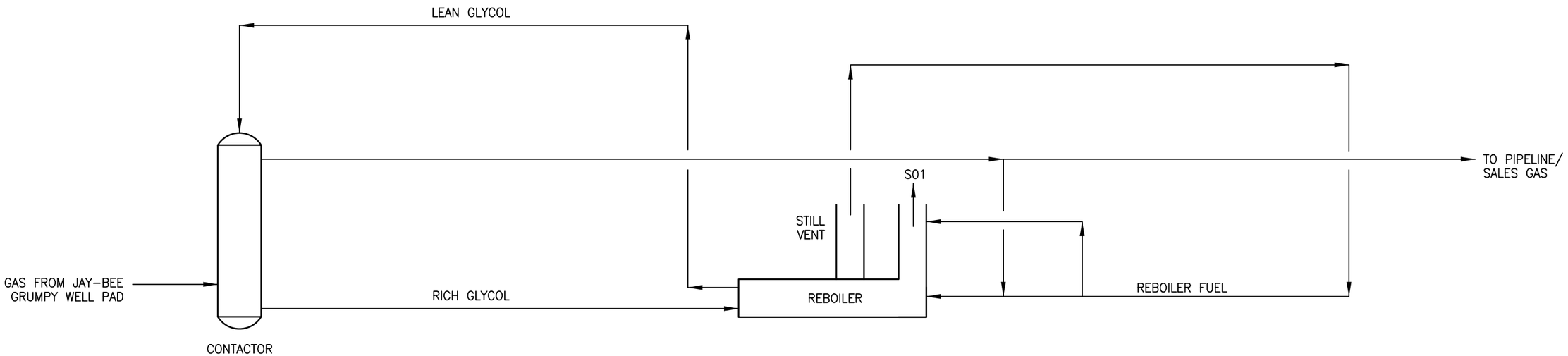
DRAWING NAME: FIGURE 2

REV. 0

Plot: env045 02/22/2016 12:46 G:\ICON MIDSTREAM, LLC\215095\FIGURE 2 GRUMPYa01.dwg

# ATTACHMENT F

# Process Flow Diagram




LEGEND:

↑ EMISSION POINT

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| SET DWG FILE | GRUMPY DEHY FAC FDb01.dwg |
| DRAWING SCALE | N.T.S. |

SE TECHNOLOGIES
98 Vanadium Road Bridgeville, PA 15017 (412) 221-1100

ICON MIDSTREAM PIPELINE, LLC

GRUMPY DEHYDRATION FACILITY
TYLER COUNTY, WEST VIRGINIA
PROCESS FLOW DIAGRAM

DRAWING NAME: FIGURE 3

REV. 1

Plot: env045 03/31/2016 15:37 G:\ICON MIDSTREAM, LLC\215095\GRUMPY DEHY FAC FDb01.dwg

# ATTACHMENT G

# Process Description

# Icon Midstream Pipeline, LLC
# Grumpy Dehydration Facility
# Attachment G – Process Description

Icon Midstream plans to install its Grumpy Dehydration Facility contiguous with the Jay-Bee Oil & Gas Grumpy Well Pad in Tyler County. The Facility will receive and manage natural gas from the contiguous well pad, dehydrate the gas and inject into a gathering line owned and operated by others.

The dehydration unit will generate emissions from the still vent and re-boiler. There is no flash tank. Vapors from the still vent are comprised of water and various low molecular weight hydrocarbons. This vapor stream will be used as fuel for the reboiler. Excess still vent vapors are routed to the still vent where they are ignited by a glow plug and combusted. Although needs are anticipated to be minimal, supplemental re-boiler fuel is available from the dehydrated gas stream prior to injection into the sales line.

As all still vent vapors are routed to the re-boiler (either as fuel of for destruction in the re-boiler), there is only one emission point at this facility.

Any water condensing in the still vent column will be routed to wastewater tanks at the contiguous Jay-Bee Grumpy Well Pad.

In summary, emission sources at this facility will include only the following:

- One 20 MMSCFD Dehydration Unit – Exterran w/ 300 MBTU/Hr reboiler

# ATTACHMENT I

# Emission Units Table

## Attachment I

## Emission Units Table

**(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)**

| Emission Unit ID[1] | Emission Point ID[2] | Emission Unit Description | Year Installed/ Modified | Design Capacity | Type[3] and Date of Change | Control Device [4] |
|---|---|---|---|---|---|---|
| RBV-1 | S01 | Dehydration Unit Re-boiler Vent | Upon Permit | 0.300 MMBTU/hr | NEW | None |
| RSV-1 | S01 | Dehydration Unit Still Vent | Upon Permit | 20 MMSCFD | NEW | RBV-1 |
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[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

# ATTACHMENT J

# Emission Points Data Summary Sheet

# Attachment J
# EMISSION POINTS DATA SUMMARY SHEET

| Table 1: Emissions Data | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Emission Point ID No. *(Must match Emission Units Table & Plot Plan)* | Emission Point Type[1] | Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)* | | Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)* | | Vent Time for Emission Unit *(chemical processes only)* | | All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)* | Maximum Potential Uncontrolled Emissions [4] | | Maximum Potential Controlled Emissions [5] | | Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)* | Est. Method Used [6] | Emission Concentration [7] (ppmv or mg/m$^4$) |
| | | ID No. | Source | ID No. | Device Type | Short Term[2] | Max (hr/yr) | | lb/hr | ton/yr | lb/hr | ton/yr | | | |
| S01 | Vent | RBV-1 RSV-1 | Re-boiler Vent and Still Vent | RBV-1 | Reboiler (Still Vent routes to reboiler) | C | 8760 | $NO_x$ | 0.03 | 0.13 | | | Gas | EE | |
| | | | | | | | | CO | 0.03 | 0.11 | | | Gas | EE | |
| | | | | | | | | VOC | 3.22 | 14.09 | | | Gas | EE | |
| | | | | | | | | SO2 | <0.01 | <0.01 | | | Gas | EE | |
| | | | | | | | | PM | <0.01 | 0.01 | | | Solid | EE | |
| | | | | | | | | Benzene | 0.03 | 0.10 | | | Gas | EE | |
| | | | | | | | | Formaldehyde | <0.01 | <0.01 | | | Gas | EE | |
| | | | | | | | | CO2e | 96 | 421 | | | Gas | EE | |

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, $CS_2$, VOCs, $H_2S$, Inorganics, Lead, Organics, $O_3$, NO, $NO_2$, $SO_2$, $SO_3$, all applicable Greenhouse Gases (including $CO_2$ and methane), etc. **DO NOT LIST** $H_2$, $H_2O$, $N_2$, $O_2$, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m$^3$) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is $SO_2$, use units of ppmv (See 45CSR10).

**Attachment J**
**EMISSION POINTS DATA SUMMARY SHEET**

| Table 2: Release Parameter Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Emission Point ID No. *(Must match Emission Units Table)* | Inner Diameter (ft.) | Exit Gas | | | Emission Point Elevation (ft) | | UTM Coordinates (km) | |
| | | Temp. (°F) | Volumetric Flow [1] (acfm) *at operating conditions* | Velocity (fps) | Ground Level *(Height above mean sea level)* | Stack Height [2] *(Release height of emissions above ground level)* | Northing | Easting |
| S01 | 0.5 | 212 | 33 | 2.8 | 1335 | 8 | | |
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[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

# ATTACHMENT K

# Fugitive Emissions Data Summary Sheet

## Attachment K

## FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

| APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS |
|---|
| 1.) Will there be haul road activities?<br>☐ Yes ☒ No<br>☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET. |
| 2.) Will there be Storage Piles?<br>☐ Yes ☒ No<br>☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET. |
| 3.) Will there be Liquid Loading/Unloading Operations?<br>☐ Yes ☒ No<br>☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET. |
| 4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation?<br>☐ Yes ☒ No<br>☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET. |
| 5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)?<br>☒ Yes ☐ No<br>☒ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET. |
| 6.) Will there be General Clean-up VOC Operations?<br>☐ Yes ☒ No<br>☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET. |
| 7.) Will there be any other activities that generate fugitive emissions?<br>☐ Yes ☒ No<br>☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form. |
| If you answered “NO” to all of the items above, it is not necessary to complete the following table, “Fugitive Emissions Summary.” |

| **FUGITIVE EMISSIONS SUMMARY** | All Regulated Pollutants - Chemical Name/CAS [1] | Maximum Potential Uncontrolled Emissions [2] | | Maximum Potential Controlled Emissions [3] | | Est. Method Used [4] |
|---|---|---|---|---|---|---|
| | | lb/hr | ton/yr | lb/hr | ton/yr | |
| Haul Road/Road Dust Emissions<br>Paved Haul Roads | | | | | | |
| Unpaved Haul Roads | | | | | | |
| Storage Pile Emissions | | | | | | |
| Loading/Unloading Operations | | | | | | |
| Wastewater Treatment Evaporation & Operations | | | | | | |
| Equipment Leaks | VOC<br>CO2<br>CH4 | Does not apply | 0.054<br>0.001<br>0.169 | Does not apply | 0.054<br>0.001<br>0.169 | EE<br>EE |
| General Clean-up VOC Emissions | | | | | | |
| Other | | | | | | |

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, $CS_2$, VOCs, $H_2S$, Inorganics, Lead, Organics, $O_3$, NO, $NO_2$, $SO_2$, $SO_3$, all applicable Greenhouse Gases (including $CO_2$ and methane), etc. DO NOT LIST $H_2$, $H_2O$, $N_2$, $O_2$, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

# LEAK SOURCE DATA SHEET

| Source Category | Pollutant | Number of Source Components[1] | Number of Components Monitored by Frequency[2] | Average Time to Repair (days)[3] | Estimated Annual Emission Rate (lb/yr)[4] |
|---|---|---|---|---|---|
| Pumps[5] | light liquid VOC[6,7] | | | | |
| | heavy liquid VOC[8] | | | | |
| | Non-VOC[9] | | | | |
| Valves[10] | Gas VOC | 24 | 0 | n/a | 62.11 lb VOC/yr |
| | Light Liquid VOC | | | | |
| | Heavy Liquid VOC | | | | |
| | Non-VOC | 24 | 0 | n/a | 1.05 lb $CO_2$/yr<br>196.14 lb $CH_4$/yr |
| Safety Relief Valves[11] | Gas VOC | 2 | 0 | n/a | 7.67 lb VOC/yr |
| | Non VOC | 2 | 0 | n/a | 0.13 lb lb $CO_2$/yr<br>24.21 lb $CH_4$/yr |
| Open-ended Lines[12] | VOC | 2 | 0 | n/a | 11.69 lb VOC/yr |
| | Non-VOC | 2 | 0 | n/a | 0.20 lb $CO_2$/yr<br>36.93 lb $CH_4$/yr |
| Sampling Connections[13] | VOC | | | | |
| | Non-VOC | | | | |
| Compressors | VOC | | | | |
| | Non-VOC | | | | |
| Flanges | VOC | | | | |
| | Non-VOC | | | | |
| Other - Connectors | VOC | 90 | 0 | n/a | 25.88 lb VOC/yr |
| | Non-VOC | 90 | 0 | n/a | 0.44 lb $CO_2$/yr<br>81.72 lb $CH_4$/yr |

[1 - 13] See notes on the following page.

# ATTACHMENT L

## Emissions Unit Data Sheet(s)

# GLYCOL DEHYDRATION EMISSION UNIT DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| General Glycol Dehydration Unit Data | | Manufacturer and Model | | Exterran HANO-486824035 | |
| | | Max Dry Gas Flow Rate (mmscf/day) | | 20 MMSCFD | |
| | | Design Heat Input (mmBtu/hr) | | 0.300 MMBTU/Hr (re-boiler) | |
| | | Design Type (DEG or TEG) | | TEG | |
| | | Source Status[2] | | NS | |
| | | Date Installed/Modified/Removed[3] | | Upon Permit | |
| | | Regenerator Still Vent APCD[4] | | | |
| | | Control Device ID[4] | | RBV-1 | |
| | | Fuel HV (Btu/scf) | | 735.1 (HHV) | |
| | | $H_2S$ Content (gr/100 scf) | | <0.001% | |
| | | Operation (hrs/yr) | | 8760 | |
| Emission Unit ID/ Emission Point ID[1] | Vent | Reference[5] | Potential Emissions[6] | lbs/hr | tons/yr |
| RBV-1 | Reboiler Vent | AP-42 | $NO_X$ | 0.03 | 0.13 |
| | | AP-42 | CO | 0.03 | 0.11 |
| | | AP-42 | VOC | 0.0017 | 0.007 |
| | | AP-42 | $SO_2$ | <0.0001 | 0.001 |
| | | AP-42 | $PM_{10}$ | <0.01 | 0.01 |
| RSV-1 | Glycol Regenerator Still Vent | GRI-GLYCalc™ | VOC | 3.2 | 14.03 |
| | | GRI-GLYCalc™ | Benzene | 0.023 | 0.10 |
| | | GRI-GLYCalc™ | Ethylbenzene | <0.0001 | <0.0001 |
| | | GRI-GLYCalc™ | Toluene | 0.279 | 1.220 |
| | | GRI-GLYCalc™ | Xylenes | 0.175 | 0.765 |
| | | GRI-GLYCalc™ | n-Hexane | 0.089 | 0.39 |

1. Enter the appropriate Emission Unit ID Numbers and Emission Point ID Numbers for the glycol dehydration unit reboiler vent and glycol regenerator still vent. The glycol dehydration unit reboiler vent and glycol regenerator still vent should be designated RBV-1 and RSV-1, respectively. If the compressor station incorporates multiple glycol dehydration units, a *Glycol Dehydration Emission Unit Data Sheet* shall be completed for each, using Source Identification #s RBV-2 and RSV-2, RBV-3 and RSV-3, etc.

2. Enter the Source Status using the following codes:

| | | | |
|---|---|---|---|
| NS | Construction of New Source | ES | Existing Source |
| MS | Modification of Existing Source | RS | Removal of Source |

3. Enter the date (or anticipated date) of the glycol dehydration unit's installation (construction of source), modification or removal.

4. Enter the Air Pollution Control Device (APCD) type designation using the following codes and the control device ID number:

| | | | |
|---|---|---|---|
| NA | None | CD | Condenser |
| FL | Flare | CC | Condenser/Combustion Combination |
| TO | Thermal Oxidizer | | |

5. Enter the Potential Emissions Data Reference designation using the following codes:

| | | | |
|---|---|---|---|
| MD | Manufacturer's Data | AP | AP-42 |
| GR | GRI-GLYCalc™ | OT | Other _____ (please list) |

6. Enter the Reboiler Vent and Glycol Regenerator Still Vent Potential to Emit (PTE) for the listed regulated pollutants in lbs per hour and tons per year. The Glycol Regenerator Still Vent potential emissions may be determined using the most recent version of the thermodynamic software model GRI-GLYCalc™ (Radian International LLC & Gas Research Institute). Attach all referenced Potential Emissions Data (or calculations) and the GRI-GLYCalc *Aggregate Calculations Report* to this *Glycol Dehydration Emission Unit Data Sheet(s)*. This PTE data shall be incorporated in the *Emissions Summary Sheet*.

**Include a copy of the GRI-GLYCalc™ analysis. This includes a printout of the aggregate calculations report, which shall include emissions reports, equipment reports, and stream reports.**

**West Virginia Department of Environmental Protection**

DIVISION OF AIR QUALITY : (304) 926-0475
WEB PAGE: http:\\www.wvdep.org

**Division of Air Quality**

**40 CFR Part 63; Subpart HH & HHH Registration Form**

*Complete this form for any oil and natural gas production or natural gas transmission and storage facility that uses an affected unit under HH/HHH, whether subject or not.*

| **Section A: Facility Description** | | | |
|---|---|---|---|
| Affected facility actual annual average natural gas throughput (scf/day): | **20 MMSCF/Day** | | |
| Affected facility actual annual average hydrocarbon liquid throughput: (bbl/day): | **N/A** | | |
| The affected facility processes, upgrades, or stores hydrocarbon liquids prior to custody transfer. | Yes | **X** | No |
| The affected facility processes, upgrades, or stores natural gas prior to the point at which natural gas (NG) enters the NG transmission and storage source category or is delivered to the end user.<br>The affected facility is: ☒ prior to a NG processing plant ☐ a NG processing plant<br>☐ prior to the point of custody transfer and there is no NG processing plant | Yes | **X** | No |
| The affected facility transports or stores natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution company). | Yes | **X** | No |
| The affected facility exclusively processes, stores, or transfers black oil.<br>Initial producing gas-to-oil ratio (GOR): _____scf/bbl API gravity: _____degrees | Yes | **X** | No |

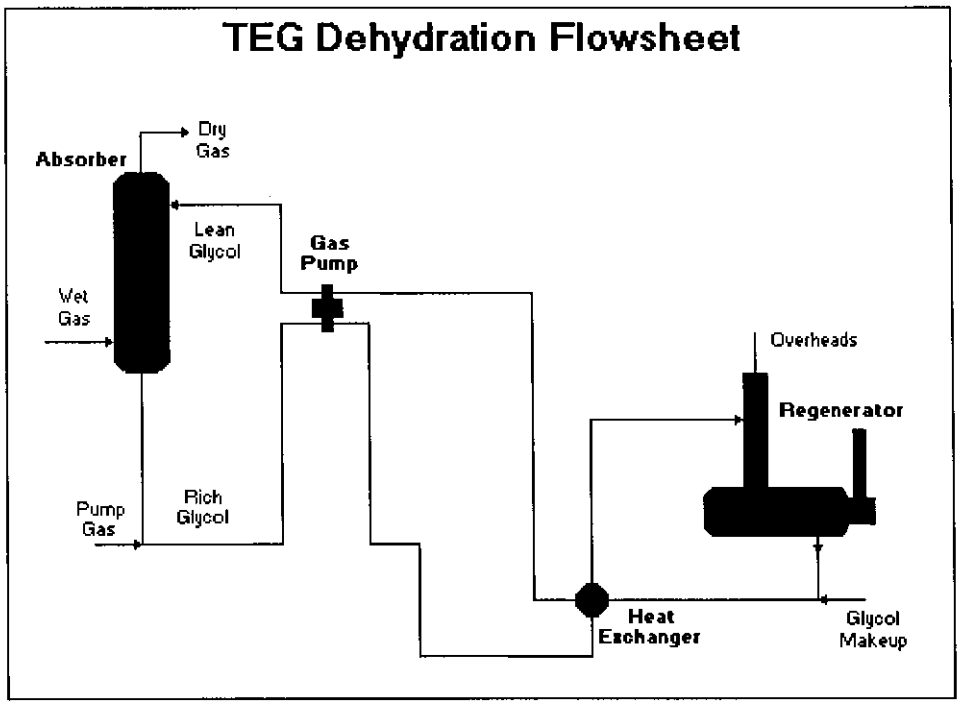
| **Section B: Dehydration Unit (if applicable)** [1] | | | |
|---|---|---|---|
| Description: | **20 MMSCFD Glycol Dehydrator** | | |
| Date of Installation: **Upon Permit** | Annual Operating Hours: **8760** | Burner rating (MMbtu/hr): **0.300** | |
| Exhaust Stack Height (ft): **8** | Stack Diameter (ft): **0.5** | Stack Temp. (ºF): **212** (Still Vent) | |
| Glycol Type: | ☒ TEG ☐ EG ☐ Other: | | |
| Glycol Pump Type: | ☐ Electric ☒ Gas If gas, what is the volume ratio? _0.08_ ACFM/gpm | | |
| Condenser installed? | ☐ Yes ☒ No Exit Temp. ___ºF Condenser Pressure ____psig | | |
| Incinerator/flare installed? | ☒ Yes ☐ No Destruction Eff. 90% | | |
| Other controls installed? | ☐ Yes ☐ No Describe: | | |
| Wet Gas[2]: (Upstream of Contact Tower) | Gas Temp.: __85 ºF Gas Pressure __500_ psig<br>Saturated Gas? ☒ Yes ☐ No If no, water content _____ lb/MMSCF | | |
| Dry Gas: (Downstream of Contact Tower) | Gas Flowrate(MMSCFD) Actual Varies_____ Design 20 MMSCF/Day<br>Water Content __7.0___ lb/MMSCF | | |
| Lean Glycol: | Circulation rate (gpm) Actual[3] ____3.5___ Maximum[4] ___3.5 __<br>Pump make/model: | | |
| Glycol Flash Tank (if applicable): | Temp.: _____ºF Pressure _____ psig Vented? Yes ☐ No ☐<br>If no, describe vapor control: Recycle/recompression | | |
| Stripping Gas (if applicable): | Source of gas: N/A Rate _____ scfm | | |

**Please attach the following required dehydration unit information:**

1. System map indicating the chain of custody information. See Page 43 of this document for an example of a gas flow schematic. It is not intended that the applicant provide this level of detail for all sources. The level of detail that is necessary is to establish where the custody transfer points are located. This can be accomplished by submitting a process flow diagram indicating custody transfer points and the natural gas flow. However, the DAQ reserves the right to request more detailed information in order to make the necessary decisions.
2. Extended gas analysis from the Wet Gas Stream including mole percents of $C_1$-$C_8$, benzene, ethylbenzene, toluene, xylene and n-Hexane, using Gas Processors Association (GPA) 2286 (or similar). A sample should be taken from the inlet gas line, downstream from any inlet separator, and using a manifold to remove entrained liquids from the sample and a probe to collect the sample from the center of the gas line. GPA standard 2166 reference method or a modified version of EPA Method TO-14, (or similar) should be used.
3. GRI-GLYCalc Ver. 3.0 aggregate report based on maximum Lean Glycol circulation rate and maximum throughput.
4. Detailed calculations of gas or hydrocarbon flow rate.

**Section C: Facility NESHAPS Subpart HH/HHH status**

| | | | |
|---|---|---|---|
| Affected facility status: (choose only one) | ☒ Subject to Subpart HH | | |
| | ☐ Subject to Subpart HHH | | |
| | ☐ Not Subject because: | ☐ < 10/25 TPY | |
| | | ☐ Affected facility exclusively handles black oil | |
| | | ☐ The facility wide actual annual average NG throughput is < 650 thousand scf/day and facility wide actual annual average hydrocarbon liquid is < 250 bpd | |
| | | ☐ No affected source is present | |


TEG Dehydration Flowsheet
Dry Gas
Absorber
Lean Glycol
Gas Pump
Wet Gas
Overheads
Regenerator
Pump Gas
Rich Glycol
Heat Exchanger
Glycol Makeup

Good

# Gas Analytical Services

Charleston, WV

844-445-4207

| | | | |
|---|---|---|---|
| **Customer** | : 8788 - JayBee Oil & Gas | **Date Sampled** | : 11/27/2015 |
| **Station ID** | : GRUMPY3 | **Date Analyzed** | : 12/10/2015 |
| **Cylinder ID** | : 0289 | **Effective Date** | : 12/01/2015 |
| **Producer** | : | **Cyl Pressure** | : 935 |
| **Lease** | : Grumpy 3 | **Temp** | : 70 |
| **Area** | : 357 - Union | **Cylinder Type** | : Spot |
| **State** | : | **Sample By** | : J Whipkey |

| COMPONENT | MOL% | GPM@14.73(PSIA) |
|---|---|---|
| Carbon-Dioxide | 0.1500 | 0.000 |
| Nitrogen | 0.6184 | 0.000 |
| Methane | 76.9823 | 0.000 |
| Ethane | 14.6121 | 3.921 |
| Propane | 4.7780 | 1.321 |
| Iso-Butane | 0.6014 | 0.197 |
| N-Butane | 1.1765 | 0.372 |
| Neo-Pentane | 0.0132 | 0.005 |
| Iso-Pentane | 0.2829 | 0.104 |
| N-Pentane | 0.2924 | 0.106 |
| N-Hexane | 0.1102 | 0.071 |
| N-Heptane | 0.0408 | 0.019 |
| N-Octane | 0.0103 | 0.005 |
| N-Nonane | 0.0016 | 0.001 |
| N-Decane | 0.0003 | 0.000 |
| Benzene | 0.0021 | 0.001 |
| Toluene | 0.0066 | 0.002 |
| Ethylbenzene | 0.0006 | 0.000 |
| M-Xylene/P-Xylene | 0.0023 | 0.001 |
| O-Xylene | 0.0005 | 0.000 |
| C6's | 0.1568 | 0.064 |
| C7's | 0.0833 | 0.037 |
| C9's | 0.0082 | 0.004 |
| C10's | 0.0010 | 0.001 |
| C11's | 0.0000 | 0.000 |
| C13's | 0.0001 | 0.000 |
| C15's | 0.0000 | 0.000 |
| C8's | 0.0681 | 0.034 |
| **TOTAL** | **100.0000** | **6.266** |

**Compressibility Factor (Z) @ 14.73 @ 60 Deg. F =** 0.9963 **C5+ GPM** : 0.28500

**Ideal Gravity:** 0.7255 **Real Gravity:** 0.7279 **C5+ Mole %** : 1.0151

| BTU @ (PSIA) | @14.65 | @14.696 | @14.73 | @15.025 |
|---|---|---|---|---|
| **Ideal GPM** | 6.211 | 6.230 | 6.245 | 6.370 |
| **Ideal BTU Dry** | 1,259.32 | 1,263.27 | 1,266.20 | 1,291.55 |
| **Ideal BTU Sat** | 1,237.28 | 1,241.23 | 1,244.16 | 1,269.51 |
| **Real GPM** | 6.233 | 6.253 | 6.267 | 6.393 |

| | | | | |
|---|---|---|---|---|
| **Real BTU Dry** | 1,263.91 | 1,267.89 | 1,270.84 | 1,296.38 |
| **Real BTU Sat** | 1,242.30 | 1,246.28 | 1,249.23 | 1,274.78 |

**Comments:**

**Gas Analysis performed in accordance with GPA 2286** **Sample Count** : 230000007

**Analytical Calculations performed in accordance with GPA 2172** **COC** :

# ATTACHMENT N

## Supporting Emissions Calculations

# Icon Midstream Pipeline,LLC

**Grumpy Dehydration Facility**
**Tyler County, WV**

| Source | Description | NOx lb/hr | CO lb/hr | CO2e lb/hr | VOC lb/hr | SO2 lb/hr | PM lb/hr | n-Hexane lb/hr | benzene lb/hr | formaldehyde lb/hr | Total HAPs lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RBV-1 | 300 MBTU/Hr Reboiler | 0.03 | 0.03 | 36.2 | 0.00 | 0.000 | 0.00 | 0.001 | 0.002 | 0.000 | 0.001 |
| RSV-1 | Controlled Still Vent | | | 59.0 | 3.20 | | | 0.089 | 0.023 | | 0.564 |
| --- | Fittings Fugitive Emissions | | | 1.0 | 0.01 | | | | | | |
| **Total** | | 0.03 | 0.03 | 96 | 3.22 | 0.00 | 0.00 | 0.09 | 0.03 | 0.00 | 0.56 |

| Source | | NOx tpy | CO tpy | CO2e tpy | VOC tpy | SO2 tpy | PM tpy | n-Hexane tpy | benzene tpy | formaldehyde tpy | Total HAPs tpy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RBV-1 | 300 MBTU/Hr Reboiler | 0.13 | 0.11 | 159 | 0.01 | 0.001 | 0.01 | 0.00 | 0.00 | 0.00 | 0.002 |
| RSV-1 | Controlled Still Vent | | | 258 | 14.03 | | | 0.39 | 0.10 | | 2.470 |
| --- | Fittings Fugitive Emissions | | | 4 | 0.05 | | | | | | |
| **Total** | **Proposed** | 0.13 | 0.11 | 421 | 14.09 | 0.00 | 0.01 | 0.39 | 0.10 | 0.00 | 2.47 |
| **Contiguous Jay Bee Grumpy Well Pad (Current Permit Application Update)** | | 3.37 | 9.29 | 4,255 | 44.25 | 0.01 | 12.79 | 1.28 | 0.00 | 0.08 | 1.61 |
| | **Aggregated Emissons** | 3.50 | 9.40 | 4,676 | 58.34 | 0.01 | 12.80 | 1.68 | 0.10 | 0.08 | 4.08 |

# Icon Midstream Pipeline,LLC

## Grumpy Dehydration Facility
## Tyler County, WV

### Dehy Stil Vent Emissions

**SOURCE RSV-1**

### Still Vent Emissions (Controlled)

From Gri GlyCalc 4.0

| | | |
|---|---|---|
| Dry Gas Rate | 20 | MMSCFD |
| Glycol Circulation Rate | 3.5 | gpm |
| Treating Temperature | 85 | Deg F |
| Treating Pressure | 500 | psi |
| Destruction Efficiency of Re-Boiler | 90 | % |

**Data From GLYCalc:**

| | | | | |
|---|---|---|---|---|
| Total HC | 6.6600 | lbs/hr | 29.171 | TPY |
| Methane | 2.3600 | lbs/hr | 10.337 | TPY |
| Total VOC | 3.2040 | lbs/hr | 14.034 | TPY |
| Total HAP | 0.5640 | lbs/hr | 2.470 | TPY |
| benzene | 0.0229 | lbs/hr | 0.100 | TPY |
| toluene | 0.2785 | lbs/hr | 1.220 | TPY |
| ethyl benzene | 0.0000 | lbs/hr | 0.000 | TPY |
| xylene | 0.1746 | lbs/hr | 0.765 | TPY |
| n-hexane | 0.0889 | lbs/hr | 0.389 | TPY |

# Icon Midstream Pipeline,LLC

## Grumpy Dehydration Facility
## Tyler County, WV

### Potential Emission Rates

## Source RBV-1

| | | |
|---|---|---|
| Burner Duty Rating | 300.0 | Mbtu/hr |
| Burner Efficiency | 98.0 | % |
| Gas Heat Content (HHV) | 735.1 | Btu/scf |
| Total Gas Consumption | 9,995 | scfd |
| H2S Concentration | 0.000 | Mole % |
| Hours of Operation | 8760 | |

| | | | | |
|---|---|---|---|---|
| NOx | 0.0300 | lbs/hr | 0.131 | TPY |
| CO | 0.0252 | lbs/hr | 0.110 | TPY |
| CO2 | 36.0 | lbs/hr | 157.7 | TPY |
| CO2e | 36 | lbs/hr | 159 | tpy |
| VOC | 0.0017 | lbs/hr | 0.007 | TPY |
| SO2 | 0.0002 | lbs/hr | 0.001 | TPY |
| H2S | 0.0000 | lbs/hr | 0.000 | TPY |
| PM10 | 0.0023 | lbs/hr | 0.010 | TPY |
| CHOH | 0.0000 | lbs/hr | 0.000 | TPY |
| Benzene | 0.0000 | lbs/hr | 0.000 | TPY |
| N-Hexane | 0.0005 | lbs/hr | 0.002 | TPY |
| Toluene | 0.0000 | lbs/hr | 0.000 | TPY |
| Total HAPs | 0.0006 | lbs/hr | 0.002 | TPY |

**AP-42 Factors Used**

| | | | |
|---|---|---|---|
| **NOx** | **100** | **Lbs/MMCF** | |
| **CO** | **84** | **Lbs/MMCF** | |
| **$CO_2$** | **120,000** | **Lbs/MMCF** | **Global Warming Potential = 1** |
| **VOC** | **5.5** | **Lbs/MMCF** | |
| **PM** | **7.6** | **Lbs/MMCF** | |
| **$SO_2$** | **0.6** | **Lbs/MMCF** | |
| **$CH_4$** | **2.3** | **Lbs/MMCF** | **Global Warming Potential = 25** |
| **$N_2O$** | **2.2** | **Lbs/MMCF** | **Global Warming Potential =298** |
| **HCOH** | **0.075** | **Lbs/MMCF** | |
| **Benzene** | **0.0021** | **Lbs/MMCF** | |
| **n-Hexane** | **1.8** | **Lbs/MMCF** | |
| **Toluene** | **0.0034** | **Lbs/MMCF** | |

# Icon Midstream Pipeline,LLC

**Grumpy Dehydration Facility**
**Tyler County, WV**

## Fugitive VOC Emissions

| | | |
|---|---|---|
| Volatile Organic Compounds, non-methane and non-ethane from gas analysis: | 18.72 | weight percent |
| Methane from gas analysis: | 59.11 | weight percent |
| Carbon Dioxide from gas analysis: | 0.32 | weight percent |
| Gas Density | 0.0585 | lb/scf |

| Emission Source: | Number* | Oil & Gas Production** | VOC % | VOC, lb/hr | VOC TPY | VOC, lb/yr | CO2 lb/hr | CO2 TPY | CO2 lb/yr | CH4 lb/hr | CH4 TPY | CH4 lb/yr | CO2e TPY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Valves:** | | | | | | | | | | | | | |
| Gas/Vapor: | 24 | 0.02700 scf/hr | 18.7 | 0.007 | 0.031 | 62.11 | 0.000 | 0.001 | 1.05 | 0.022 | 0.098 | 196.14 | 2.45 |
| **Relief Valves:** | 2 | 0.04000 scf/hr | 18.7 | 0.001 | 0.004 | 7.67 | 0.000 | 0.000 | 0.13 | 0.003 | 0.012 | 24.21 | 0.30 |
| **Open-ended Lines, gas:** | 2 | 0.06100 sfc/hr | 18.7 | 0.001 | 0.006 | 11.69 | 0.000 | 0.000 | 0.20 | 0.004 | 0.018 | 36.93 | 0.46 |
| **Connectors:** | | | | | | | | | | | | | |
| Gas: | 90 | 0.00300 scf/hr | 18.7 | 0.003 | 0.013 | 25.88 | 0.000 | 0.000 | 0.44 | 0.009 | 0.041 | 81.72 | 1.02 |

***Fugitive Calculations:***

| | lb/hr | tpy |
|---|---|---|
| VOC | **0.012** | **0.054** |
| CH4 | **0.039** | **0.169** |
| CO2 | **0.000** | **0.001** |
| CO2e | **0.968** | **4.238** |

Notes:
*Numbers are from 40 CFR 98, Table W-1B
**Factors are from 40 CFR 98, Table W-1A (scf/hr), where available. Remaining are API (lb/hr)

# Icon Midstream Pipeline,LLC

**Grumpy Dehydration Facility**
**Tyler County, WV**

## Inlet Gas Composition:

| | Fuel Gas mole % | Fuel M.W. lb/lb-mole | Fuel S.G. | Fuel Wt. % | LHV, dry Btu/scf | HHV, dry Btu/scf | AFR vol/vol | VOC NM / NE | Z Factor | GPM |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, N2 | 0.618 | 0.173 | 0.006 | 0.829 | | | - | | 0.0062 | |
| Carbon Dioxide, CO2 | 0.150 | 0.066 | 0.002 | 0.316 | | | - | | 0.0015 | |
| Hydrogen Sulfide, H2S | 0.000 | 0.000 | 0.000 | 0.000 | 0.0 | 0.0 | 0.000 | | 0.0000 | |
| Helium, He | - | - | - | - | | | - | | - | |
| Oxygen, O2 | - | - | - | - | | | - | | - | |
| Methane, CH4 | 76.982 | 12.350 | 0.426 | 59.108 | 700.1 | 777.5 | 7.336 | | 0.7683 | |
| Ethane, C2H6 | 14.612 | 4.394 | 0.152 | 21.029 | 236.5 | 258.6 | 2.437 | | 0.1449 | 3.887 |
| Propane | 4.778 | 2.107 | 0.073 | 10.084 | 110.6 | 120.2 | 1.138 | 10.084 | 0.0469 | 1.310 |
| Iso-Butane | 0.601 | 0.349 | 0.012 | 1.672 | 18.0 | 19.5 | 0.186 | 1.672 | 0.0058 | 0.196 |
| Normal Butane | 1.177 | 0.684 | 0.024 | 3.274 | 35.4 | 38.4 | 0.365 | 3.274 | 0.0114 | 0.369 |
| Iso Pentane | 0.296 | 0.214 | 0.007 | 1.022 | 10.9 | 11.8 | 0.113 | 1.022 | 0.0030 | 0.108 |
| Normal Pentane | 0.292 | 0.211 | 0.007 | 1.008 | 10.8 | 11.7 | 0.111 | 1.008 | 0.0029 | 0.105 |
| Hexane | 0.267 | 0.119 | 0.008 | 0.570 | 11.8 | 12.7 | 0.121 | 0.570 | 0.0026 | 0.109 |
| Heptane+ | 0.227 | 0.227 | 0.008 | 1.089 | 11.6 | 12.5 | 0.119 | 1.089 | 0.0023 | 0.104 |
| | 100.000 | 20.894 | 0.725 | | 1,145.8 | 1,263.0 | 11.926 | 18.719 | 0.9958 | 6.187 |

**Gas Density (STP) = 0.058**

| | |
|---|---|
| Ideal Gross (HHV) | 1,263.0 |
| Ideal Gross (sat'd) | 1,241.8 |
| GPM | - |
| Real Gross (HHV) | 1,268.3 |
| Real Net (LHV) | 1,150.6 |

# Icon Midstream Pipeline,LLC

**Grumpy Dehydration Facility**
**Tyler County, WV**

## Still Vent Gas Composition Information:

| | Fuel Gas mole % | Fuel M.W. lb/lb-mole | Fuel S.G. | Fuel Wt. % | LHV, dry Btu/scf | HHV, dry Btu/scf | AFR vol/vol | VOC NM / NE | Z Factor | GPM |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, N2 | 0.2350 | 0.066 | 0.002 | 0.293 | | | - | | 0.0023 | |
| Carbon Dioxide, CO2 | 0.1540 | 0.068 | 0.002 | 0.301 | | | - | | 0.0015 | |
| Hydrogen Sulfide, H2S | | - | - | - | | | - | | - | |
| Water | 55.1000 | 9.918 | 0.342 | 44.094 | | | - | | 0.5513 | |
| Oxygen, O2 | | - | - | - | | | - | | - | |
| Methane, CH4 | 29.1000 | 4.669 | 0.161 | 20.756 | 264.6 | 293.9 | 2.773 | | 0.2904 | |
| Ethane, C2H6 | 7.2100 | 2.168 | 0.075 | 9.639 | 116.7 | 127.6 | 1.203 | | 0.0715 | 1.918 |
| Propane | 3.0400 | 1.341 | 0.046 | 5.960 | 70.4 | 76.5 | 0.724 | 5.960 | 0.0299 | 0.833 |
| Iso-Butane | 0.4720 | 0.274 | 0.009 | 1.220 | 14.2 | 15.3 | 0.146 | 1.220 | 0.0046 | 0.154 |
| Normal Butane | 1.1100 | 0.645 | 0.022 | 2.868 | 33.4 | 36.2 | 0.344 | 2.868 | 0.0107 | 0.348 |
| Iso Pentane | 0.2960 | 0.214 | 0.007 | 0.949 | 10.9 | 11.8 | 0.113 | 0.949 | 0.0030 | 0.108 |
| Normal Pentane | 0.3490 | 0.252 | 0.009 | 1.120 | 12.9 | 14.0 | 0.133 | 1.120 | 0.0035 | 0.126 |
| Hexane | 0.4350 | 0.375 | 0.013 | 1.667 | 19.2 | 20.7 | 0.197 | 1.667 | 0.0043 | 0.178 |
| Heptane | 2.4990 | 2.504 | 0.086 | 11.133 | 127.4 | 137.5 | 1.310 | 11.133 | 0.0249 | 1.147 |
| | 100.000 | 22.493 | 0.777 | | 669.8 | 733.6 | 6.942 | 24.917 | 0.9979 | 4.811 |

**Gas Density (STP) = 0.063**

| | |
|---|---|
| Ideal Gross (HHV) | 733.6 |
| Ideal Gross (sat'd) | 721.6 |
| GPM | - |
| Real Gross (HHV) | 735.1 |
| Real Net (LHV) | 671.2 |

**GAS DATA INFORMATION**

Specific Graivity of Air, @ 29.92 in. Hg and 60 -F, 28.9625
One mole of gas occupies, @ 14.696 psia & 32 -F, 359.2 cu ft. per lb-mole
One mole of gas occupies, @ 14.696 psia & 60 -F, 379.64 cu ft. per lb-mole

Hydrogen Sulfide (H2S) conversion chart:

| | | | |
|---|---|---|---|
| 0 grains H2S/100 scf | = | 0.00000 | mole % H2S |
| | | 0.0 | ppmv H2S |
| 0 mole % H2S | = | 0 | grains H2S/100 scf |
| | | 0.0 | ppmv H2S |
| 0 ppmv H2S | = | 0.000 | grains H2S/100 scf |
| | | 0.00000 | mole % H2S |

**Ideal Gas at 14.696 psia and 60°F**

| | | MW lb/mol | Specific Gravity | Lb per Cu Ft | Cu Ft per Lb | LHV, dry Btu/scf | HHV, dry Btu/scf | LHV Btu/lb | HHV Btu/lb | cu ft of air / 1 cu ft of gas | Z factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen | N2 | 28.013 | 0.9672 | 0.0738 | 13.552 | 0 | 0 | 0 | 0 | 0 | 0.9997 |
| Carbon Dioxide | CO2 | 44.010 | 1.5196 | 0.1159 | 8.626 | 0 | 0 | 0 | 0 | 0 | 0.9964 |
| Hydrogen Sulfide | H2S | 34.076 | 1.1766 | 0.0898 | 11.141 | 587 | 637 | 6,545 | 7,100 | 7.15 | 0.9846 |
| Water | H20 | 18.000 | 0.6215 | 0.0474 | 21.091 | 0 | 0 | 0 | 0 | 0 | 1.0006 |
| Oxygen | O2 | 31.999 | 1.1048 | 0.0843 | 11.864 | 0 | 0 | 0 | 0 | 0 | 0.9992 |
| Methane | CH4 | 16.043 | 0.5539 | 0.0423 | 23.664 | 909.4 | 1,010.0 | 21,520 | 23,879 | 9.53 | 0.9980 |
| Ethane | C2H6 | 30.070 | 1.0382 | 0.0792 | 12.625 | 1,618.7 | 1,769.6 | 20,432 | 22,320 | 16.68 | 0.9919 |
| Propane | C3H8 | 44.097 | 1.5226 | 0.1162 | 8.609 | 2,314.9 | 2,516.1 | 19,944 | 21,661 | 23.82 | 0.9825 |
| Iso-Butane | C4H10 | 58.124 | 2.0069 | 0.1531 | 6.532 | 3,000.4 | 3,251.9 | 19,629 | 21,257 | 30.97 | 0.9711 |
| Normal Butane | C4H10 | 58.124 | 2.0069 | 0.1531 | 6.532 | 3,010.8 | 3,262.3 | 19,680 | 21,308 | 30.97 | 0.9667 |
| Iso Pentane | C5H12 | 72.151 | 2.4912 | 0.1901 | 5.262 | 3,699.0 | 4,000.9 | 19,478 | 21,052 | 38.11 | 1.0000 |
| Normal Pentane | C5H12 | 72.151 | 2.4912 | 0.1901 | 5.262 | 3,706.9 | 4,008.9 | 19,517 | 21,091 | 38.11 | 1.0000 |
| Hexane | C6H14 | 86.178 | 2.9755 | 0.2270 | 4.405 | 4,403.8 | 4,755.9 | 19,403 | 20,940 | 45.26 | 0.9879 |
| Heptane | C7H16 | 100.205 | 3.4598 | 0.2639 | 3.789 | 5,100.0 | 5,502.5 | 22,000 | 23,000 | 52.41 | 0.9947 |

**Real Gas at 14.696 psia and 60°F**

| | | MW lb/mol | Specific Gravity | Lb per Cu Ft | Cu Ft per Lb | LHV, dry Btu/scf | HHV, dry Btu/scf | LHV Btu/lb | HHV Btu/lb | cu ft of air / 1 cu ft of gas | Gal/Mole | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen | N2 | 28.013 | 0.9672 | 0.0738 | 13.552 | 0 | 0 | 0 | 0 | 0 | 4.1513 | |
| Carbon Dioxide | CO2 | 44.010 | 1.5196 | 0.1159 | 8.626 | 0 | 0 | 0 | 0 | 0 | 6.4532 | |
| Hydrogen Sulfide | H2S | 34.076 | 1.1766 | 0.0898 | 11.141 | 621 | 672 | 6,545 | 7,100 | 7.15 | 5.1005 | |
| Water | H2O | 18.000 | 0.6215 | 0.0474 | 21.091 | | | | | | 3.8376 | |
| Oxygen | O2 | 31.999 | 1.1048 | 0.0843 | 11.864 | 0 | 0 | 0 | 0 | 0 | 3.3605 | |
| Methane | CH4 | 16.043 | 0.5539 | 0.0423 | 23.664 | 911 | 1,012 | 21,520 | 23,879 | 9.53 | 6.4172 | |
| Ethane | C2H6 | 30.070 | 1.0382 | 0.0792 | 12.625 | 1,631 | 1,783 | 20,432 | 22,320 | 16.68 | 10.126 | |
| Propane | C3H8 | 44.097 | 1.5226 | 0.1162 | 8.609 | 2,353 | 3,354 | 19,944 | 21,661 | 23.82 | 10.433 | |
| Iso-Butane | C4H10 | 58.124 | 2.0069 | 0.1531 | 6.532 | 3,101 | 3,369 | 19,629 | 21,257 | 30.97 | 12.386 | |
| Normal Butane | C4H10 | 58.124 | 2.0069 | 0.1531 | 6.532 | 3,094 | 3,370 | 19,680 | 21,308 | 30.97 | 11.937 | |
| Iso Pentane | C5H12 | 72.151 | 2.4912 | 0.1901 | 5.262 | 3,709 | 4,001 | 19,478 | 21,052 | 38.11 | 13.86 | |
| Normal Pentane | C5H12 | 72.151 | 2.4912 | 0.1901 | 5.262 | 3,698 | 4,009 | 19,517 | 21,091 | 38.11 | 13.713 | |
| Hexane | C6H14 | 86.178 | 2.9755 | 0.2270 | 4.405 | 4,404 | 4,756 | 19,403 | 20,940 | 45.26 | 15.566 | 16.3227 |
| Heptane | C7H16 | 100.205 | 3.4598 | 0.2639 | 3.789 | 5,101 | 5,503 | 22,000 | 23,000 | 52.41 | 17.468 | 17.468 |

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Icon Midstream - Grumpy
File Name: C:\Rogers_Files\Misc\Jay-Bee Oil & Gas\Icon Midstream\Grumpy\Grumpy No Cond.ddf
Date: February 23, 2016

DESCRIPTION:

Description: 20 MMSCFD
Still as Fuel and Excess to Still Column for destruction
No Flash Tank

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 85.00 deg. F
Pressure: 500.00 psig
Wet Gas Water Content: Saturated

| Component | Conc. (vol %) |
|---|---|
| Carbon Dioxide | 0.1500 |
| Nitrogen | 0.6180 |
| Methane | 76.9820 |
| Ethane | 14.6120 |
| Propane | 4.7780 |
| Isobutane | 0.6010 |
| n-Butane | 1.1770 |
| Isopentane | 0.2960 |
| n-Pentane | 0.2920 |
| n-Hexane | 0.1100 |
| Other Hexanes | 0.1570 |
| Heptanes | 0.1240 |
| Benzene | 0.0010 |
| Toluene | 0.0070 |
| Xylenes | 0.0020 |
| C8+ Heavies | 0.0890 |

DRY GAS:

Flow Rate: 20.0 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Flow Rate: 3.5 gpm

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

REGENERATOR OVERHEADS CONTROL DEVICE:

---

| | |
|---|---|
| Control Device: | Combustion Device |
| Destruction Efficiency: | 90.0 % |
| Excess Oxygen: | 5.0 % |
| Ambient Air Temperature: | 60.0 deg. F |

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Icon Midstream - Grumpy
File Name: C:\Rogers_Files\Misc\Jay-Bee Oil & Gas\Icon Midstream\Grumpy\Grumpy No Cond.ddf
Date: February 23, 2016

DESCRIPTION:

Description: 20 MMSCFD
Still as Fuel and Excess to Still Column for destruction
No Flash Tank

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

| Component | lbs/hr | lbs/day | tons/yr |
|---|---|---|---|
| Methane | 2.3603 | 56.647 | 10.3380 |
| Ethane | 1.0960 | 26.305 | 4.8006 |
| Propane | 0.6766 | 16.238 | 2.9634 |
| Isobutane | 0.1386 | 3.325 | 0.6069 |
| n-Butane | 0.3258 | 7.820 | 1.4271 |
| Isopentane | 0.1078 | 2.586 | 0.4720 |
| n-Pentane | 0.1274 | 3.057 | 0.5579 |
| n-Hexane | 0.0889 | 2.134 | 0.3894 |
| Other Hexanes | 0.1007 | 2.417 | 0.4411 |
| Heptanes | 0.2131 | 5.114 | 0.9334 |
| Benzene | 0.0229 | 0.550 | 0.1005 |
| Toluene | 0.2785 | 6.683 | 1.2197 |
| Xylenes | 0.1746 | 4.189 | 0.7646 |
| C8+ Heavies | 0.9492 | 22.780 | 4.1574 |
| Total Emissions | 6.6602 | 159.845 | 29.1718 |
| Total Hydrocarbon Emissions | 6.6602 | 159.845 | 29.1718 |
| Total VOC Emissions | 3.2039 | 76.894 | 14.0332 |
| Total HAP Emissions | 0.5649 | 13.557 | 2.4741 |
| Total BTEX Emissions | 0.4760 | 11.423 | 2.0847 |

UNCONTROLLED REGENERATOR EMISSIONS

| Component | lbs/hr | lbs/day | tons/yr |
|---|---|---|---|
| Methane | 23.6028 | 566.466 | 103.3801 |
| Ethane | 10.9602 | 263.046 | 48.0059 |
| Propane | 6.7657 | 162.377 | 29.6338 |
| Isobutane | 1.3855 | 33.252 | 6.0685 |
| n-Butane | 3.2581 | 78.195 | 14.2706 |
| Isopentane | 1.0776 | 25.861 | 4.7197 |
| n-Pentane | 1.2738 | 30.570 | 5.5791 |
| n-Hexane | 0.8890 | 21.337 | 3.8940 |
| Other Hexanes | 1.0070 | 24.169 | 4.4108 |
| Heptanes | 2.1310 | 51.143 | 9.3336 |
| Benzene | 0.2293 | 5.504 | 1.0045 |
| Toluene | 2.7848 | 66.834 | 12.1972 |
| Xylenes | 1.7456 | 41.894 | 7.6456 |

| | | | |
|---|---|---|---|
| C8+ Heavies | 9.4918 | 227.804 | 41.5741 |
| Total Emissions | 66.6022 | 1598.452 | 291.7175 |
| Total Hydrocarbon Emissions | 66.6022 | 1598.452 | 291.7175 |
| Total VOC Emissions | 32.0392 | 768.940 | 140.3316 |
| Total HAP Emissions | 5.6487 | 135.569 | 24.7413 |
| Total BTEX Emissions | 4.7597 | 114.232 | 20.8473 |

EQUIPMENT REPORTS:

COMBUSTION DEVICE

Ambient Temperature: 60.00 deg. F
Excess Oxygen: 5.00 %
Combustion Efficiency: 90.00 %
Supplemental Fuel Requirement: 2.92e-001 MM BTU/hr

| Component | Emitted | Destroyed |
|---|---|---|
| Methane | 10.00% | 90.00% |
| Ethane | 10.00% | 90.00% |
| Propane | 10.00% | 90.00% |
| Isobutane | 10.00% | 90.00% |
| n-Butane | 10.00% | 90.00% |
| Isopentane | 10.00% | 90.00% |
| n-Pentane | 10.00% | 90.00% |
| n-Hexane | 10.00% | 90.00% |
| Other Hexanes | 10.00% | 90.00% |
| Heptanes | 10.00% | 90.00% |
| Benzene | 10.00% | 90.00% |
| Toluene | 10.00% | 90.00% |
| Xylenes | 10.00% | 90.00% |
| C8+ Heavies | 10.00% | 90.00% |

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages: 1.25
Calculated Dry Gas Dew Point: 3.68 lbs. H2O/MMSCF

Temperature: 85.0 deg. F
Pressure: 500.0 psig
Dry Gas Flow Rate: 20.0000 MMSCF/day
Glycol Losses with Dry Gas: 0.0750 lb/hr
Wet Gas Water Content: Saturated
Calculated Wet Gas Water Content: 63.69 lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio: 4.20 gal/lb H2O

| Component | Remaining in Dry Gas | Absorbed in Glycol |
|---|---|---|
| Water | 5.76% | 94.24% |
| Carbon Dioxide | 99.84% | 0.16% |
| Nitrogen | 99.99% | 0.01% |

| | | |
|---|---|---|
| Methane | 99.99% | 0.01% |
| Ethane | 99.96% | 0.04% |
| Propane | 99.93% | 0.07% |
| Isobutane | 99.90% | 0.10% |
| n-Butane | 99.86% | 0.14% |
| Isopentane | 99.85% | 0.15% |
| n-Pentane | 99.80% | 0.20% |
| n-Hexane | 99.65% | 0.35% |
| Other Hexanes | 99.74% | 0.26% |
| Heptanes | 99.30% | 0.70% |
| Benzene | 86.71% | 13.29% |
| Toluene | 80.42% | 19.58% |
| Xylenes | 62.65% | 37.35% |
| C8+ Heavies | 97.23% | 2.77% |

REGENERATOR

No Stripping Gas used in regenerator.

| Component | Remaining in Glycol | Distilled Overhead |
|---|---|---|
| Water | 37.09% | 62.91% |
| Carbon Dioxide | 0.00% | 100.00% |
| Nitrogen | 0.00% | 100.00% |
| Methane | 0.00% | 100.00% |
| Ethane | 0.00% | 100.00% |
| Propane | 0.00% | 100.00% |
| Isobutane | 0.00% | 100.00% |
| n-Butane | 0.00% | 100.00% |
| Isopentane | 0.33% | 99.67% |
| n-Pentane | 0.36% | 99.64% |
| n-Hexane | 0.41% | 99.59% |
| Other Hexanes | 0.78% | 99.22% |
| Heptanes | 0.45% | 99.55% |
| Benzene | 4.97% | 95.03% |
| Toluene | 7.87% | 92.13% |
| Xylenes | 12.89% | 87.11% |
| C8+ Heavies | 11.74% | 88.26% |

STREAM REPORTS:

WET GAS STREAM

Temperature: 85.00 deg. F
Pressure: 514.70 psia
Flow Rate: 8.35e+005 scfh

| Component | Conc. (vol%) | Loading (lb/hr) |
|---|---|---|
| Water | 1.34e-001 | 5.32e+001 |
| Carbon Dioxide | 1.50e-001 | 1.45e+002 |
| Nitrogen | 6.17e-001 | 3.80e+002 |
| Methane | 7.69e+001 | 2.71e+004 |
| Ethane | 1.46e+001 | 9.65e+003 |

| | | |
|---|---|---|
| Propane | 4.77e+000 | 4.63e+003 |
| Isobutane | 6.00e-001 | 7.67e+002 |
| n-Butane | 1.18e+000 | 1.50e+003 |
| Isopentane | 2.96e-001 | 4.69e+002 |
| n-Pentane | 2.92e-001 | 4.63e+002 |
| n-Hexane | 1.10e-001 | 2.08e+002 |
| Other Hexanes | 1.57e-001 | 2.97e+002 |
| Heptanes | 1.24e-001 | 2.73e+002 |
| Benzene | 9.99e-004 | 1.72e+000 |
| Toluene | 6.99e-003 | 1.42e+001 |
| Xylenes | 2.00e-003 | 4.66e+000 |
| C8+ Heavies | 8.89e-002 | 3.33e+002 |
| Total Components | 100.00 | 4.63e+004 |

DRY GAS STREAM

Temperature: 85.00 deg. F
Pressure: 514.70 psia
Flow Rate: 8.33e+005 scfh

| Component | Conc. (vol%) | Loading (lb/hr) |
|---|---|---|
| Water | 7.74e-003 | 3.06e+000 |
| Carbon Dioxide | 1.50e-001 | 1.45e+002 |
| Nitrogen | 6.18e-001 | 3.80e+002 |
| Methane | 7.70e+001 | 2.71e+004 |
| Ethane | 1.46e+001 | 9.65e+003 |
| Propane | 4.78e+000 | 4.63e+003 |
| Isobutane | 6.01e-001 | 7.67e+002 |
| n-Butane | 1.18e+000 | 1.50e+003 |
| Isopentane | 2.96e-001 | 4.68e+002 |
| n-Pentane | 2.91e-001 | 4.62e+002 |
| n-Hexane | 1.10e-001 | 2.08e+002 |
| Other Hexanes | 1.57e-001 | 2.96e+002 |
| Heptanes | 1.23e-001 | 2.71e+002 |
| Benzene | 8.67e-004 | 1.49e+000 |
| Toluene | 5.63e-003 | 1.14e+001 |
| Xylenes | 1.25e-003 | 2.92e+000 |
| C8+ Heavies | 8.66e-002 | 3.24e+002 |
| Total Components | 100.00 | 4.62e+004 |

LEAN GLYCOL STREAM

Temperature: 85.00 deg. F
Flow Rate: 3.50e+000 gpm

| Component | Conc. (wt%) | Loading (lb/hr) |
|---|---|---|
| TEG | 9.84e+001 | 1.94e+003 |
| Water | 1.50e+000 | 2.96e+001 |
| Carbon Dioxide | 1.18e-012 | 2.33e-011 |
| Nitrogen | 2.18e-013 | 4.29e-012 |
| Methane | 4.93e-018 | 9.71e-017 |
| Ethane | 8.60e-008 | 1.69e-006 |
| Propane | 6.67e-009 | 1.31e-007 |
| Isobutane | 1.22e-009 | 2.40e-008 |

| | | |
|---|---|---|
| n-Butane | 2.66e-009 | 5.23e-008 |
| Isopentane | 1.83e-004 | 3.61e-003 |
| n-Pentane | 2.35e-004 | 4.62e-003 |
| n-Hexane | 1.86e-004 | 3.67e-003 |
| Other Hexanes | 4.00e-004 | 7.88e-003 |
| Heptanes | 4.90e-004 | 9.66e-003 |
| Benzene | 6.09e-004 | 1.20e-002 |
| Toluene | 1.21e-002 | 2.38e-001 |
| Xylenes | 1.31e-002 | 2.58e-001 |
| C8+ Heavies | 6.41e-002 | 1.26e+000 |
| Total Components | 100.00 | 1.97e+003 |

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 85.00 deg. F
Pressure: 514.70 psia
Flow Rate: 3.75e+000 gpm
NOTE: Stream has more than one phase.

| Component | Conc. (wt%) | Loading (lb/hr) |
|---|---|---|
| TEG | 9.29e+001 | 1.94e+003 |
| Water | 3.82e+000 | 7.97e+001 |
| Carbon Dioxide | 1.65e-002 | 3.43e-001 |
| Nitrogen | 1.60e-002 | 3.33e-001 |
| Methane | 1.13e+000 | 2.36e+001 |
| Ethane | 5.25e-001 | 1.10e+001 |
| Propane | 3.24e-001 | 6.77e+000 |
| Isobutane | 6.64e-002 | 1.39e+000 |
| n-Butane | 1.56e-001 | 3.26e+000 |
| Isopentane | 5.18e-002 | 1.08e+000 |
| n-Pentane | 6.13e-002 | 1.28e+000 |
| n-Hexane | 4.28e-002 | 8.93e-001 |
| Other Hexanes | 4.86e-002 | 1.01e+000 |
| Heptanes | 1.03e-001 | 2.14e+000 |
| Benzene | 1.16e-002 | 2.41e-001 |
| Toluene | 1.45e-001 | 3.02e+000 |
| Xylenes | 9.60e-002 | 2.00e+000 |
| C8+ Heavies | 5.15e-001 | 1.08e+001 |
| Total Components | 100.00 | 2.09e+003 |

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.92e+003 scfh

| Component | Conc. (vol%) | Loading (lb/hr) |
|---|---|---|
| Water | 5.51e+001 | 5.01e+001 |
| Carbon Dioxide | 1.54e-001 | 3.43e-001 |
| Nitrogen | 2.35e-001 | 3.33e-001 |
| Methane | 2.91e+001 | 2.36e+001 |
| Ethane | 7.21e+000 | 1.10e+001 |
| Propane | 3.04e+000 | 6.77e+000 |
| Isobutane | 4.72e-001 | 1.39e+000 |
| n-Butane | 1.11e+000 | 3.26e+000 |

| | | |
|---|---|---|
| Isopentane | 2.96e-001 | 1.08e+000 |
| n-Pentane | 3.49e-001 | 1.27e+000 |
| n-Hexane | 2.04e-001 | 8.89e-001 |
| Other Hexanes | 2.31e-001 | 1.01e+000 |
| Heptanes | 4.21e-001 | 2.13e+000 |
| Benzene | 5.81e-002 | 2.29e-001 |
| Toluene | 5.98e-001 | 2.78e+000 |
| Xylenes | 3.25e-001 | 1.75e+000 |
| C8+ Heavies | 1.10e+000 | 9.49e+000 |
| Total Components | 100.00 | 1.17e+002 |

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 8.54e+001 scfh

| Component | Conc. (vol%) | Loading (lb/hr) |
|---|---|---|
| Methane | 6.54e+001 | 2.36e+000 |
| Ethane | 1.62e+001 | 1.10e+000 |
| Propane | 6.82e+000 | 6.77e-001 |
| Isobutane | 1.06e+000 | 1.39e-001 |
| n-Butane | 2.49e+000 | 3.26e-001 |
| Isopentane | 6.64e-001 | 1.08e-001 |
| n-Pentane | 7.84e-001 | 1.27e-001 |
| n-Hexane | 4.58e-001 | 8.89e-002 |
| Other Hexanes | 5.19e-001 | 1.01e-001 |
| Heptanes | 9.45e-001 | 2.13e-001 |
| Benzene | 1.30e-001 | 2.29e-002 |
| Toluene | 1.34e+000 | 2.78e-001 |
| Xylenes | 7.31e-001 | 1.75e-001 |
| C8+ Heavies | 2.48e+000 | 9.49e-001 |
| Total Components | 100.00 | 6.66e+000 |

# ATTACHMENT O

# Monitoring, Recordkeeping, Reporting and Testing Plan

# ATTACHMENT O

# Icon Midstream Pipeline, LLC

# Grumpy Dehydration Facility

# Monitoring, Recordkeeping, Reporting and Testing Plan

## I. Monitoring

Icon Midstream (Icon) will monitor actual annual benzene emissions.

## II. Recordkeeping

Icon will maintain accurate operating records of the dehydration unit for each calendar year. Records will include actual annual benzene emissions.

## III. Testing

None anticipated.

## IV. Reporting

Icon will submit certified emission statements on an annual basis in accordance with WVDEP, Division of Air Quality requirements.

# ATTACHMENT P

# Public Notice

Tyler Star News Legals Print Ad Proof

ADNo: 2161 Customer Number: L00411
Customer Name: Company: SE TECHNOLOGIES
Address: 98 VANADIUM ROAD
City/St/Zip: BRIDGEVILLE ,PA 15017
Phone: (412) 221-1100 Solicitor: VV
Category: 10 Class: 1000 Rate: LE-0 Start: 4-6-2016 Stop: 4-6-2016
Lines: 48 Inches: 4.67 Words: 213

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Credit Card: Expire:
Order Number:
Cost: 45.40 Extra Charges: .00 Adjustments: .00
Payments: .00 Discount: .00
Balance: 45.40

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**AIR QUALITY PERMIT NOTICE**

**Notice of Application**

Notice is given that Icon Midstream Pipeline, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit Registration for its Grumpy Dehydration Facility located off of Indian Creek Road near Middlebourne, WV in Tyler County, West Virginia (Lat.39.467595, Long. -80.764129).

The applicant estimates the potential to discharge the following regulated air pollutants:

0.13 tons of Nitrogen Oxides per year

0.11 tons of Carbon Monoxide per year

14.24 tons of Volatile Organics per year

<0.01 tons of Sulfur Dioxide per year

0.01 tons of Particulate Matter per year

0.10 tons of Benzene

0.39 tons of n-Hexane

1.22 tons of Toluene

0.76 tons of Xylene

432 tons of CO2e per year

Startup of the modified operation is planned to begin on or about the 15th day of June, 2016. 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 permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the 6th day of April, 2016.
**TSN 2161 4/6**