MarkWest Liberty Midstream & Resources, L.L.C.
1515 Arapahoe Street
Tower 1, Suite 1600
Denver, CO 80202-2126
(800) 730-8388
(303) 290-8700
(303) 825-0920 Fax

January 17, 2024

Sheri Guerrieri
Environmental Engineer Manager
PA DEP SW Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

Re: MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant
Plan Approval Application

Dear Sheri Guerrieri:

MarkWest Liberty Midstream & Resources, L.L.C. (MPLX) hereby submits a plan approval application for the Harmon Creek Gas Plant located at 123 Point Pleasant Rd in Smith Township, Washington County. The Harmon Creek Gas Plant is currently authorized to operate under PA-63-01011 and GP5-63-01011B.

MPLX seeks authorization to install and operate equipment associated with Harmon Creek Cryo III with a processing capacity of 330 MMSCFD and DeEthanizer II. In addition to the equipment currently authorized at the facility, MPLX proposes the installation and operation of the following air emission sources at the facility:

- One (1) cryo plant regenerative heater rated at a maximum heat input of 21.75 MMBtu/hr equipped with flue gas recirculation (FGR);
- Two (2) deethanizer hot medium oil (HMO) heaters rated at a maximum heat input of 73.85 MMBtu/hr equipped with FGR;
- One (1) 500-gallon methanol storage tank;
- One (1) high-pressure pig receiver controlled by the process flare;
- Three (3) electric-driven centrifugal compressors and associated dry gas venting;
- One (1) electric-driven reciprocating compressor; and
- Associated fugitive components.

De minimis emission increases associated with truck loadout operations, in addition to emissions from maintenance blowdowns and some pressure relief devices, where feasible, will be controlled by the existing process flare.

If you have any questions about this application, please contact me at (412) 815-8886 or via email at ajuarez@marathonpetroleum.com.

Sincerely,

Alexandra M. Juarez
Environmental Engineer

Table of Contents

General Information Form

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CENTER FOR ENVIRONMENTAL EXCELLENCE

GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This form is used by the Department of Environmental Protection (DEP) to inform our programs regarding what other DEP permits or authorizations may be needed for the proposed project or activity. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the DEP.

Related ID#s (If Known)				DEP USE ONLY
Client ID#		**APS ID#**		Date Received & General Notes
Site ID#	823541	**Auth ID#**		
Facility ID#	819388			

CLIENT INFORMATION

DEP Client ID#	Client Type/Code	Dun & Bradstreet ID#
	OWOP	

Legal Organization Name or Registered Fictitious Name	Employer ID# (EIN)	Is the EIN a SSN?
MarkWest Liberty Midstream and Resources, L.L.C	30-0528059	☐ Yes ☒ No

State of Incorporation or Registration of Fictious Name
Delaware

☐ **Corporation** ☒ **LLC** ☐ **Partnership** ☐ **LLP** ☐ **LP**
☐ **Sole Proprietorship** ☐ **Association/Organization**
☐ **Estate/Trust** ☐ **Other**

Individual Last Name	First Name	MI	Suffix

Additional Individual Last Name	First Name	MI	Suffix

Mailing Address Line 1	Mailing Address Line 2
1515 Arapahoe St	Tower 1, Suite 1600

Address Last Line – City	State	ZIP+4	Country
Denver	CO	80202-2137	USA

Client Contact Last Name	First Name	MI	Suffix
Juarez	Alexandra	M	

Client Contact Title	Phone	Ext	Cell Phone
Environmental Engineer	412-815-8886		

Email Address	FAX
ajuarez@marathonpetroleum.com	303-573-4954

SITE INFORMATION

DEP Site ID#	Site Name
823541	Harmon Creek Gas Plant

EPA ID# **Estimated Number of Employees to be Present at Site** 25

Description of Site
Natural Gas Processing Plant

Tax Parcel ID(s):

County Name(s)	Municipality(ies)	City	Boro	Twp	State
Washington	Smith	☐	☐	☒	PA
		☐	☐	☐	
		☐	☐	☐	

☐	☐	☐

Site Location Line 1	**Site Location Line 2**	
123 Point Pleasant Rd		
Site Location Last Line – City	**State**	**ZIP+4**
Bulger	PA	15019

Detailed Written Directions to Site

From Pittsburgh head west on Hwy 22 to Exit 60A, stay left on Steubenville Pike (0.9 mi.), turn left onto Creek Road (0.5 mi.), keep left to stay on Point Pleasant Road (1.3 mi.), turn left into Harmon Creek Gas Plant

Site Contact Last Name	**First Name**	**MI**	**Suffix**
Ettore	David	G	
Site Contact Title	**Site Contact Firm**		
Environmental Manager	MarkWest Liberty Midstream and Resources, L.L.C.		
Mailing Address Line 1	**Mailing Address Line 2**		
4600 J. Barry Court	Suite 500		
Mailing Address Last Line – City	**State**	**ZIP+4**	
Canonsburg	**PA**	**15317**	

Phone	**Ext**	**FAX**	**Email Address**
724-873-2803			DGEttore@marathonpetroleum.com

NAICS Codes (Two- & Three-Digit Codes – List All That Apply)	**6-Digit Code** (Optional)
211130	NA

Client to Site Relationship

OWNOP

FACILITY INFORMATION

Modification of Existing Facility	**Yes**	**No**
1. Will this project modify an existing facility, system, or activity?	☒	☐
2. Will this project involve an addition to an existing facility, system, or activity?	☒	☐

If "Yes", check all relevant facility types and provide DEP facility identification numbers below.

	Facility Type	**DEP Fac ID#**		**Facility Type**	**DEP Fac ID#**
☒	Air Emission Plant	819388	☐	Industrial Minerals Mining Operation	
☐	Beneficial Use (water)		☐	Laboratory Location	
☐	Blasting Operation		☐	Land Recycling Cleanup Location	
☐	Captive Hazardous Waste Operation		☐	Mine Drainage Treatment / Land Recycling Project Location	
☐	Coal Ash Beneficial Use Operation		☐	Municipal Waste Operation	
☐	Coal Mining Operation		☐	Oil & Gas Encroachment Location	
☐	Coal Pillar Location		☐	Oil & Gas Location	
☐	Commercial Hazardous Waste Operation		☐	Oil & Gas Water Poll Control Facility	
☐	Dam Location		☐	Public Water Supply System	
☐	Deep Mine Safety Operation -Anthracite		☐	Radiation Facility	
☐	Deep Mine Safety Operation -Bituminous		☐	Residual Waste Operation	
☐	Deep Mine Safety Operation -Ind Minerals		☐	Storage Tank Location	
☐	Encroachment Location (water, wetland)		☐	Water Pollution Control Facility	
☐	Erosion & Sediment Control Facility		☐	Water Resource	
☐	Explosive Storage Location		☐	Other:	

Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
Harmon Creek Gas Plant	40	24	4	80	21	26

Horizontal Accuracy Measure	Feet	*--or--*	Meters	
Horizontal Reference Datum Code	☐	North American Datum of 1927		
	☐	North American Datum of 1983		
	☒	World Geodetic System of 1984		
Horizontal Collection Method Code				
Reference Point Code				
Altitude	Feet	1,171	*--or--*	Meters
Altitude Datum Name	☐	The National Geodetic Vertical Datum of 1929		
	☐	The North American Vertical Datum of 1988 (NAVD88)		
Altitude (Vertical) Location Datum Collection Method Code				
Geometric Type Code				
Data Collection Date				
Source Map Scale Number		Inch(es)	=	Feet
--or--		Centimeter(s)	=	Meters

PROJECT INFORMATION

Project Name

Harmon Creek 3

Project Description

The Harmon Creek III Project will include air emission sources as follows: one (1) regenerative heater rated at 21.75 MMBtu/hr, two (2) hot oil heaters rated at 73.85 MMBtu/hr, four (4) electric-driven compressor vents, one (1) high-pressure pig receiver, and associated fugitive components. Potential de minimis increases at the facility will include closed drain tank loadout emissions, measurement devices, and one (1) new 500-gallon methanol tank. Emissions from maintenance blowdowns, pigging activities, closed drain loadout, and some pressure relief devices, where feasible, from Harmon Creek Cryo III and DeEthanizer II will be controlled by the process flare. The existing plant flare PTE will remain unchanged.

Project Consultant Last Name	First Name	MI	Suffix
None used			

Project Consultant Title	Consulting Firm

Mailing Address Line 1	Mailing Address Line 2

Address Last Line – City	State	ZIP+4

Phone	Ext	FAX	Email Address

Time Schedules	Project Milestone (Optional)
December 2024	Expected Construction Start
November 2025	Expected Construction Completion
December 2025	Expected Start Up

1. Is the project located in or within a 0.5-**mile radius of an Environmental Justice community as defined by DEP?** ☒ Yes ☐ No

To determine if the project is located in or within a 0.5-mile radius of an environmental justice community, please use the online PennEnviroScreen tool. To see specific EJ areas, select the appropriate year of your submittal from the themes box on the right.

2. Have you informed the surrounding community prior to submitting the application to the Department? ☒ Yes ☐ No

Method of notification: nicipal notifications per 25 Pa. Code § 127.413

3. **Have you addressed community concerns that were identified?** ☐ Yes ☐ No ☒ N/A

If no, please briefly describe the community concerns that have been expressed and not addressed.

4. **Is your project funded by state or federal grants?** ☐ Yes ☒ No

Note: If "Yes", specify what aspect of the project is related to the grant and provide the grant source, contact person and grant expiration date.

Aspect of Project Related to Grant

Grant Source: _____

Grant Contact Person: _____

Grant Expiration Date: _____

5. **Is this application for an authorization on Appendix A of the Land Use Policy? (For referenced list, see Appendix A of the Land Use Policy attached to GIF instructions)** ☐ Yes ☒ No

Note: If "No" to Question 5, the application is not subject to the Land Use Policy.

If "Yes" to Question 5, the application is subject to this policy and the Applicant should answer the additional questions in the **Land Use Information** section.

LAND USE INFORMATION

Note: Applicants should submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1. **Is there an adopted county or multi-county comprehensive plan?** ☐ Yes ☐ No

2. **Is there a county stormwater management plan?** ☐ Yes ☐ No

3. **Is there an adopted municipal or multi-municipal comprehensive plan?** ☐ Yes ☐ No

4. **Is there an adopted county-wide zoning ordinance, municipal zoning ordinance or joint municipal zoning ordinance?** ☐ Yes ☐ No

Note: If the Applicant answers "No" to either Questions 1, 3 or 4, the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 5 and 6 below.

If the Applicant answers "Yes" to questions 1, 3 and 4, the Applicant should respond to questions 5 and 6 below.

5. **Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval?** If zoning approval has been received, attach documentation. ☐ Yes ☐ No

6. **Have you attached Municipal and County Land Use Letters for the project?** ☐ Yes ☐ No

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 at PHMC's online portal, PA-SHARE.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	**Is this a coal mining project?** If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0.	☐	Yes	☒	No
1.1	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day?**	☐	Yes	☐	No
1.2	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year?**	☐	Yes	☐	No
1.3	**Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used?**	☐	Yes	☐	No
1.4	**For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
1.5	**Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No
1.6	**Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well?**	☐	Yes	☐	No
2.0	**Is this a non-coal (industrial minerals) mining project?** If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0.	☐	Yes	☒	No
2.1	**Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel?**	☐	Yes	☐	No
2.2	**Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials?**	☐	Yes	☐	No
2.3	**Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)?**	☐	Yes	☐	No
2.4	**For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No

2.5	**Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐ Yes	☐ No
3.0	**Will your project, activity, or authorization have anything to do with a well related to oil or gas production, have construction within 200 feet of, affect an oil or gas well, involve the waste from such a well, or string power lines above an oil or gas well?** If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0.	☒ Yes	☐ No
3.1	**Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?**	☐ Yes	☒ No
3.2	**Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system?** If "Yes", discuss in *Project Description*.	☐ Yes	☐ No
3.3	**Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?**	☐ Yes	☒ No
4.0	**Will the project involve a construction activity that results in earth disturbance?** If "Yes", specify the total disturbed acreage.	☐ Yes	☒ No
	4.0.1 Total Disturbed Acreage		
	4.0.2 Will the project discharge or drain to a special protection water (EV or HQ) or an EV wetland?	☐ Yes	☐ No
	4.0.3 Will the project involve a construction activity that results in earth disturbance in the area of the earth disturbance that are contaminated at levels exceeding residential or non-residential medium-specific concentrations (MSCs) in 25 Pa. Code Chapter 250 at residential or non-residential construction sites, respectively?	☐ Yes	☐ No
5.0	**Does the project involve any of the following: water obstruction and/or encroachment, wetland impacts, or floodplain project by the Commonwealth/political subdivision or public utility?** If "Yes", respond to 5.1-5.7. If "No", skip to Question 6.0.	☐ Yes	☒ No
5.1	**Water Obstruction and Encroachment Projects – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water?**	☐ Yes	☐ No
5.2	**Wetland Impacts – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a wetland?**	☐ Yes	☐ No

5.3	**Floodplain Projects by the Commonwealth, a Political Subdivision of the Commonwealth or a Public Utility – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a floodplain?**	☐ Yes	☐ No
5.4	**Is your project an interstate transmission natural gas pipeline?**	☐ Yes	☐ No
5.5	**Does your project consist of linear construction activities which result in earth disturbance in two or more DEP regions AND three or more counties?**	☐ Yes	☐ No
5.6	**Does your project utilize Floodplain Restoration as a best management practice for Post Construction Stormwater Management?**	☐ Yes	☐ No
5.7	**Does your project utilize Class V Gravity / Injection Wells as a best management practice for Post Construction Stormwater Management?**	☐ Yes	☐ No
6.0	**Will the project involve discharge of construction related stormwater to a dry swale, surface water, ground water or separate storm water system?**	☐ Yes	☒ No
6.1	**Will the project involve discharge of industrial waste stormwater or wastewater from an industrial activity or sewage to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system?**	☐ Yes	☐ No
7.0	**Will the project involve the construction and operation of industrial waste treatment facilities?**	☐ Yes	☒ No
8.0	**Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations?** If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the *Project Description*, where applicable.	☐ Yes	☒ No
8.0.1	**Estimated Proposed Flow (gal/day)**		
9.0	**Will the project involve the subdivision of land, or the generation of 800 gpd or more of sewage on an existing parcel of land or the generation of an additional 400 gpd of sewage on an already-developed parcel, or the generation of 800 gpd or more of industrial wastewater that would be discharged to an existing sanitary sewer system?**	☐ Yes	☒ No
9.0.1	**Was Act 537 sewage facilities planning submitted and approved by DEP?** If "Yes" attach the approval letter. Approval required prior to 105/NPDES approval.	☐ Yes	☐ No
10.0	**Is this project for the beneficial use of biosolids for land application within Pennsylvania?** If "Yes" indicate how much (i.e. gallons or dry tons per year).	☐ Yes	☒ No
10.0.1	**Gallons Per Year (residential septage)**		
10.0.2	**Dry Tons Per Year (biosolids)**		

11.0 **Does the project involve construction, modification or removal of a dam?** If "Yes", identify the dam. ☐ Yes ☒ No

11.0.1 **Dam Name**

12.0 **Will the project interfere with the flow from, or otherwise impact, a dam?** If "Yes", identify the dam. ☐ Yes ☒ No

12.0.1 **Dam Name**

13.0 **Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)?** ☒ Yes ☐ No

13.0.1 If "Yes", is the operation subject to the agricultural exemption in 35 P.S. § 4004.1? ☐ Yes ☒ No

13.0.2 If the answer to 13.0.1 is "No", identify each type of emission followed by the estimated amount of that emission.

Enter all types & amounts of emissions; Detailed emission estimates are attached **separate each set with semicolons.**

14.0 **Does the project include the construction or modification of a drinking water supply to serve 15 or more connections or 25 or more people, at least 60 days out of the year?** If "Yes," check all proposed sub-facilities. ☐ Yes ☒ No

14.0.1 **Number of Persons Served**

14.0.2 **Number of Employee/Guests**

14.0.3 **Number of Connections**

14.0.4 **Sub-Fac: Distribution System** ☐ Yes ☐ No

14.0.5 **Sub-Fac: Water Treatment Plant** ☐ Yes ☐ No

14.0.6 **Sub-Fac: Source** ☐ Yes ☐ No

14.0.7 **Sub-Fac: Pump Station** ☐ Yes ☐ No

14.0.8 **Sub-Fac: Transmission Main** ☐ Yes ☐ No

14.0.9 **Sub-Fac: Storage Facility** ☐ Yes ☐ No

15.0 **Will your project include infiltration of storm water or waste water to ground water within one-half mile of a public water supply well, spring or infiltration gallery?** ☐ Yes ☒ No

16.0 **Is your project to be served by an existing public water supply?** If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project. ☐ Yes ☒ No

16.0.1 **Supplier's Name**

16.0.2 **Letter of Approval from Supplier is Attached** ☐ Yes ☐ No

17.0 **Will this project be served by on-lot drinking water wells?** ☐ Yes ☒ No

18.0 **Will this project involve a new or increased drinking water withdrawal from a river, stream, spring, lake, well or other water bod(ies)?** If "Yes," reference Safe Drinking Water Program. ☐ Yes ☒ No

18.0.1 **Source Name**

19.0	**Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste?** If "Yes," indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed. **19.0.1 Type & Amount**	☐ Yes	☒ No
20.0	**Will your project involve the removal of coal, minerals, contaminated media, or solid waste as part of any earth disturbance activities?**	☐ Yes	☒ No
21.0	**Does your project involve installation of a field constructed underground storage tank?** If "Yes," list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **21.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No
22.0	**Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility?** If "Yes," list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **22.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No
23.0	**Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724?** If "Yes," list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **23.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No
24.0	**Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **24.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No
	NOTE: If the project includes the installation of a regulated storage tank system, including diesel emergency generator systems, the project may require the use of a Department Certified Tank Handler. For a full list of regulated storage tanks and substances, please go to www.dep.pa.gov search term storage tanks		
25.0	**Will the intended activity involve the use of a radiation source?**	☐ Yes	☒ No

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

For applicants supplying an EIN number: I am applying for a permit or authorization from the Pennsylvania Department of Environmental Protection (DEP). As part of this application, I will provide DEP with an accurate EIN number for the applicant entity. By filing this application with DEP, I hereby authorize DEP to confirm the accuracy of the EIN number provided with the Pennsylvania Department of Revenue. As applicant, I further consent to the Department of Revenue discussing the same with DEP prior to issuance of the Commonwealth permit or authorization.

Type or Print Name Robert W. Shough

Signature	Title	Date
Robert W Shough III	Operations Director	1/18/24

Plan Approval Application Forms

2700-PM-AQ0007 Rev. 7/2004

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Submit in Triplicate

PROCESSES

Application for Plan Approval to Construct, Modify or Reactivate an Air Contamination Source and/or Install an Air Cleaning Device

This application must be submitted with the General Information Form (GIF).

Before completing this form, read the instructions provided for the form.

Section A - Facility Name, Checklist And Certification

Organization Name or Registered Fictitious Name/Facility Name: MarkWest Liberty Midstream & Resources, LLC

DEP Client ID# (if known): 30-0528059

Type of Review required and Fees:

- ☐ Source which is not subject to NSPS, NESHAPs, MACT, NSR and PSD: ..... $____
- ☒ Source requiring approval under NSPS or NESHAPS or both: $7,500
- ☐ Source requiring approval under NSR regulations: ..... $____
- ☐ Source requiring the establishment of a MACT limitation: ..... $____
- ☐ Source requiring approval under PSD: ..... $____

Applicant's Checklist

Check the following list to make sure that all the required documents are included.

- ☒ **General Information Form (GIF)**
- ☒ **Processes Plan Approval Application**
- ☒ **Compliance Review Form** or provide reference of most recently submitted compliance review form for facilities submitting on a periodic basis: ____
- ☒ **Copy and Proof of County and Municipal Notifications**
- ☒ **Permit Fees**
- ☒ **Addendum A:** Source Applicable Requirements (only applicable to existing Title V facility)

Certification of Truth, Accuracy and Completeness by a Responsible Official

I, Rob Shough, certify under penalty of law in 18 Pa. C. S. A. §4904, and 35 P.S. §4009(b) (2) that based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate and complete.

(Signature): Rob Shough III Date: 1/18/24

Name (Print): Robert W. Shough Title: Operation Director

OFFICIAL USE ONLY

Application No. ____ Unit ID ____ Site ID ____

DEP Client ID #: ____ APS. ID ____ AUTH. ID ____

Date Received ____ Date Assigned ____ Reviewed By ____

Date of 1st Technical Deficiency ____ Date of 2nd Technical Deficiency ____

Comments: ____

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.

The Harmon Creek III Project will include air emission sources as follows: one (1) regenerative heater rated at 21.75 MMBtu/hr, two (2) hot oil heaters rated at 73.85 MMBtu/hr, four (4) electric-driven compressor vents, one (1) high-pressure pig receiver, and associated fugitive components. Potential de minimis increases at the facility will include closed drain tank loadout emissions, measurement devices, and one (1) new 500-gallon methanol tank. Emissions from maintenance blowdowns, pigging activities, closed drain loadout, and some pressure relief devices, where feasible, from Harmon Creek Cryo III and DeEthanizer II will be controlled by the process flare. The existing plant flare PTE will remain unchanged.

Manufacturer	Model No.	Number of Sources
N/A	N/A	8
Source Designation	**Maximum Capacity**	**Rated Capacity**
Various	330 MMSCFD	330 MMSCFD

Type of Material Processed
Natural Gas

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)
None

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
	330 MMSCF		

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Seasonal variations (Months) From to

If variations exist, describe them

2. Fuel

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	0.017 X 10^6 SCF	grain/100 SCF		1153 Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3.1 Burner

Manufacturer	Type and Model No.	Number of Burners
Tulsa Heaters	Enhanced IFGR and CUBL-4W-HC-HZ	1

Description:
Cryo III Regeneration Heater Equipped with Flue Gas Recirculation (Source ID 038, Facility ID H-3711)

Rated Capacity	Maximum Capacity
17.34 MMBtu/hr	21.75 MMBtu/hr

3.2 Burner

Manufacturer	Type and Model No.	Number of Burners
Tulsa Heaters	Enhanced IFGR and CUBL-16W-HC-HZ	1

Description:
DeEthanizer II HMO Heater Equipped with Flue Gas Recirculation (Source ID 039, Facility ID H-3767)

Rated Capacity	Maximum Capacity
62.23 MMBtu/hr	73.85 MMBtu/hr

3.3 Burner

Manufacturer	Type and Model No.	Number of Burners
Tulsa Heaters	Enhanced IFGR and CUBL-16W-HC-HZ	1

Description:
DeEthanizer II HMO Heater Equipped with Flue Gas Recirculation (Source ID 040, Facility ID H-3738)

Rated Capacity	Maximum Capacity
62.23 MMBtu/hr	73.85 MMBtu/hr

4. Process Storage Vessels

A. For Liquids: *(New Source)*

Name of material stored
Methanol

Tank I.D. No.	Manufacturer	Date Installed
TBD	Exterran	Upon Approval

Design Pressure	Capacity (gallons/Meter^3)
16 oz/in2	500

Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)
N/A

Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)
N/A	N/A

Type of Roof: Describe:
None – Horizontal tank

Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):
50 gal	

B. For Solids – *Not Applicable*		
Type: ☐ Silo ☐ Storage Bin ☐Other, Describe		Name of Material Stored
Silo/Storage Bin I.D. No.	Manufacturer	Date Installed
State whether the material will be stored in loose or bags in silos		Capacity (Tons)
Turn over per year in tons		Turn over per day in tons
Describe fugitive dust control system for loading and handling operations		
Describe material handling system		

5. Request for Confidentiality
Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information (Continued)

6. Miscellaneous Information

Attach flow diagram of process giving all (gaseous, liquid and solid) flow rates. Also, list all raw materials charged to process equipment, and the amounts charged (tons/hour, etc.) at rated capacity (give maximum, minimum and average charges describing fully expected variations in production rates). Indicate (on diagram) all points where contaminants are controlled (location of water sprays, collection hoods, or other pickup points, etc.). Describe collection hoods location, design, airflow and capture efficiency. Describe any restriction requested and how it will be monitored.

See Process Flow Description and Diagram appended.

Describe fully the facilities provided to monitor and to record process operating conditions, which may affect the emission of air contaminants. Show that they are reasonable and adequate.

Heaters (038-040) - Fuel usage meters will be installed to monitor fuel consumption by the heaters.
Compressor Vents (601) - Volumetric flow measurements will be conducted as required under NSPS OOOOb.
Process Flare (C601) - The existing meter at the flare header will continue to monitor the flow rate to the process flare.
Fugitives (701) - Leak detection will be conducted in accordance with NSPS OOOOb.
Pigging (801) – Pigging event information will be tracked.

Describe each proposed modification to an existing source.

The process flare (C601), currently authorized under GP5-63-01011B and PA-63-01011, will control the proposed compressor maintenance blowdowns and emissions from pressure relief valves, where feasible. Actual emissions from the process flare from sources associated with the Harmon Creek III Project is not anticipated to be greater than that included in the previous plan approval application. Therefore, potential emission estimates will not increase.

Identify and describe all fugitive emission points, all relief and emergency valves and any by-pass stacks.

The potential emission estimates attached have accounted for anticipated fugitive emission points associated with the new equipment. Some pressure relief devices, where feasible, will be controlled by the plant flare.

Pumps will be monitored via weekly inspections and monthly Method 21. MPLX conducts a quarterly LDAR program using a gas leak detector approved for Method 21 and/or an OGI camera. In addition, Harmon Creek operators conduct daily AVO inspections on the HC3 fugitive components.

Describe how emissions will be minimized especially during start up, shut down, process upsets and/or disruptions.

One (1) 20” inlet high-pressure pigging receiver is being proposed with HC3. Consistent with the 2018 Consent Decree (CD), the pigging equipment at Harmon Creek will be equipped with pig ramps and grounded steel receptacles that are covered when not in use, and vapors from depressurizing pigging barrels are/will be routed to the process flare. The CD requires high pressure pigging equipment to be connected to a low pressure gathering line where commercially reasonable and technically feasible. The connection of the high pressure launcher to a low pressure line would require MPLX to use more than 100 feet of piping and connect to a line located outside the fence line of the facility. Thus, per the CD, jumper lines at Harmon Creek are not commercially reasonable and technically feasible.

When feasible, emissions from compressor blowdowns and facility outages will be routed to the process flare.

Anticipated Milestones:

i. Expected commencement date of construction/reconstruction/installation: December 2024
ii. Expected completion date of construction/reconstruction/installation: November 2025
iii. Anticipated date of start-up: December 2025

Section C - Air Cleaning Device

1. Precontrol Emissions* - *See Emission Calculations Attached*

Pollutant	Maximum Emission Rate				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM					
PM_{10}					
SO_x					
CO					
NO_x					
VOC					
Others: (e.g., HAPs)	-----	-----	-----	-----	-----

* These emissions must be calculated based on the requested operating schedule and/or process rate, e.g., operating schedule for maximum limits or restricted hours of operation and/or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Gas Cooling – *N/A*

Water quenching ☐ Yes ☐ No Water injection rate _____ GPM

Radiation and convection cooling ☐ Yes ☐ No	Air dilution ☐ Yes ☐ No If yes, _____CFM
Forced Draft ☐ Yes ☐ No	Water cooled duct work ☐ Yes ☐ No
Other	
Inlet Volume _____ACFM @ _____°F _____% Moisture	Outlet Volume _____ACFM @ _____°F _____% Moisture

Describe the system in detail.

Section C - Air Cleaning Device (Continued)

12. Flares *(Existing Source)*

Equipment Specifications

Manufacturer	Type	Model No.
John Zink	☐ Elevated flare ☐ Ground flare ☒ Other Air Assisted Describe	EEF Series

Design Volume (SCFM)	Dimensions of stack (ft.)
Design Volumes provided by manufacturer varies based on different scenarios. Facility Potential Volume: 100 mmscf/yr	Diameter 6'11" Height 199

Residence time (sec.) and outlet temperature (°F)	Turn down ratio	Burner details
N/A	N/A	Waste gas

Describe the flare design (air/steam-assisted or nonassisted), essential auxiliaries including pilot flame monitor of proposed flare with a sketch.

Stable in winds up to a velocity of 160 mph in all positions around the flare tip, the WindPROOF Pilot consists of a tip and tip windshield, ignition and fuel piping, venturi mixer, strainer, and a mixer windshield. Also included are two integral thermowells for thermocouple pilot detection. Two blowers to supply low pressure air are provided with the air assisted flare. The motors driving these blowers are designed to operate with a Variable Frequency Drive (VFD). The VFD allows a wide range of rotational speeds (typically from 10 to 100%).

Describe the operation of the flare's ignition system.

The Zeus Electric Spark Ignitor delivers a spark at the end of a probe mounted on the Zeus equipped pilot. The spark ignites a small slip stream of gas/air mixture taken from the main pilot supply above the pilot mixer. The flame front generated at the probe travels a short distance from the end of the probe to the pilot ignition hood where it lights the pilot. The Zeus ignitor control box located in a panel at grade uses a capacitive discharge to generate a periodic spark approximately once every 8 seconds.

Describe the provisions to introduce auxiliary fuel to the flare.

None needed.

Operation Parameters

Detailed composition of the waste gas	Heat content	Exit velocity
Conservatively assumes facility inlet. See detailed emission calculations attached.	1413.78	Maximum velocity calculated based on manufacturer provided design scenario flowrate is 83.3 ft/s

Maximum and average gas flow burned (ACFM)	Operating temperature (°F)
Maximum flow rate based on manufacturer provided design scenarios is 558,500 lb/hr. Facility Potential Volume: 100 mmscf/yr	Varies

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Alarms are set to trigger when specific conditions are met such as the absence of a pilot flame. The conditions which trigger alarms are determined based on Cause and Effect control documents.

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
VOC	667.19 tpy	13.34 tpy	98%
HAP	11.40 tpy	0.23 tpy	98%

Section C - Air Cleaning Device (Continued)

13. Other Control Equipment – *N/A*

Equipment Specifications

Manufacturer	Type	Model No.

Design Volume (SCFM)	Capacity

Describe pH monitoring and pH adjustment, if any.

Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any.

Attach efficiency curve and/or other efficiency information.

Attach any additional date including auxiliary equipment and operation details to thoroughly evaluate the control equipment.

Operation Parameters

Volume of gas handled

_____ ACFM @ _____ °F _____ % Moisture

Describe fully giving important parameters and method of operation.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)

Section C - Air Cleaning Device (Continued)

14. Costs

Indicate cost associated with air cleaning device and its operating cost (attach documentation if necessary)

The process flare is an existing source and thus cost is not evaluated.

The estimated cost of the cryo process heater equipped with flue gas recirculation is included below. The cost of the flue gas recirculation system on each heater is not expected to differ significantly.

Device	Direct Cost	Indirect Cost	Total Cost	Annual Operating Cost
Heater equipped with Flue Gas Recirculation	$284,000	$284,000	$568,000	$5,070

15. Miscellaneous

Describe in detail the removal, handling and disposal of dust, effluent, etc. from the air cleaning device including proposed methods of controlling fugitive emissions.

N/A

Attach manufacturer's performance guarantees and/or warranties for each of the major components of the control system (or complete system).

The existing process flare has guaranteed destruction efficiency of 98%.

The heater emission guarantees are included in the Deailed Emission Estimates section.

Attach the maintenance schedule for the control equipment and any part of the process equipment that if in disrepair would increase air contaminant emissions.

The maintenance schedule for the flare is conducted on an as-needed basis through annual third-party inspections. The inspections include all parts of the process that would increase air emissions if in disrepair.

Tune ups and inspections on the heaters are conducted as recommended by the manufacturer.

Section D - Additional Information

Will the construction, modification, etc. of the sources covered by this application increase emissions from other sources at the facility? If so, describe and quantify.

No. All sources with the potential to increase in emissions have been included in this application.

If this project is subject to any one of the following, attach a demonstration to show compliance with applicable standards.

a. Prevention of Significant Deterioration permit (PSD), 40 CFR 52? ☐ YES ☒ NO

b. New Source Review (NSR), 25 Pa. Code Chapter 127, Subchapter E? ☐ YES ☒ NO

c. New Source Performance Standards (NSPS), 40 CFR Part 60? ☒ YES ☐ NO
(If Yes, which subpart) OOOOb, Dc

d. National Emissions Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61? (If Yes, which subpart) ☐ YES ☒ NO

e. Maximum Achievable Control Technology (MACT) 40 CFR Part 63? ☐ YES ☒ NO
(If Yes, which part)

Attach a demonstration showing that the emissions from any new sources will be the minimum attainable through the use of best available technology (BAT).

MPLX has appended the BAT analysis conducted for the Harmon Creek 2 project. The previous BAT analysis continues to apply to the existing process flare and measurement devices. There are no VOC service reciprocating compressors associated with the HC3 project, therefore, a BAT analysis is not applicable.

The heaters associated with the project will each be equipped with a flue gas recirculation (FGR) system previously determined to meet the BAT emission standards.

The proposed centrifugal compressors associated with the HC3 project will comply with the NSPS OOOOb standards in addition to routing dry seal vents from the regen compressors to the process flare for increased emissions reduction.

Best Available Technology Costs

Device	Direct Cost	Indirect Cost	Total Cost	Annual Operating Cost	PTE Change (TPY)

Provide emission increases and decreases in allowable (or potential) and actual emissions within the last five (5) years for applicable PSD pollutant(s) if the facility is an existing major facility (PSD purposes).

A major stationary source is defined as either a source in one of the 28 source categories identified in 40 CFR 52.21 that has a potential to emit 100 tons or more per year of any regulated NSR pollutant, or any other stationary source that has the potential to emit 250 tons or more per year of a regulated NSR pollutant.

The emissions increase associated with the Harmon Creek III project is less than 40 tpy for each regulated NSR pollutant. The Harmon Creek facility does not have the potential to emit more than 100 tpy of any regulated NSR pollutant and therefore, is not subject to a PSD review. Finally, the Harmon Creek III project is a separate project from the Harmon Creek I and II projects as gas processing plants are not designed or constructed until a demand exists from producers. MPLX has no control over if and when additional processing capacity may be required.

Section D - Additional Information (Continued) – *Not Applicable*

Indicate emission increases and decreases in tons per year (tpy), for volatile organic compounds (VOCs) and nitrogen oxides (NOx) for NSR applicability since January 1, 1991 or other applicable dates (see other applicable dates in instructions). The emissions increases include all emissions including stack, fugitive, material transfer, other emission generating activities, quantifiable emissions from exempted source(s), etc.

Permit number (if applicable)	Date issued	Indicate ***Yes*** or ***No*** if emission increases and decreases were used previously for netting	Source I. D. or Name	VOCs		NOx	
				Emission increases in potential to emit (tpy)	Creditable emission decreases in actual emissions (tpy)	Emission increases in potential to emit (tpy)	Creditable emission decreases in actual emissions (tpy)

If the source is subject to 25 Pa. Code Chapter 127, Subchapter E, New Source Review requirements,

a. Identify Emission Reduction Credits (ERCs) for emission offsets or demonstrate ability to obtain suitable ERCs for emission offsets.

b. Provide a demonstration that the lowest achievable emission rate (LAER) control techniques will be employed (if applicable).

c. Provide an analysis of alternate sites, sizes, production processes and environmental control techniques demonstrating that the benefits of the proposed source outweigh the environmental and social costs (if applicable).

Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of Article III and applicable requirements of the Clean Air Act adopted thereunder The Department may request additional information to evaluate the application such as a standby plan, a plan for air pollution emergencies, air quality modeling, etc.

Section E - Compliance Demonstration

Not Applicable – See Addendum A

Note: Complete this section if source is not a Title V facility. Title V facilities must complete Addendum A.

Method of Compliance Type: Check all that apply and complete all appropriate sections below

☐ Monitoring ☐ Testing ☐ Reporting

☐ Recordkeeping ☐ Work Practice Standard

Monitoring:

a. Monitoring device type (Parameter, CEM, etc):

b. Monitoring device location:

c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Monitoring:

a. Monitoring device type (Parameter, CEM, etc):

b. Monitoring device location:

c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Recordkeeping:

Describe what parameters will be recorded and the recording frequency:

Reporting:

a. Describe what is to be reported and frequency of reporting:

b. Reporting start date:_____

Section F - Flue and Air Contaminant Emission

1. Estimated Atmospheric Emissions*

Pollutant	Maximum emission rate: specify units (lb/mmscf) (lb/mmbtu)*	Maximum emission rate: lbs/hr	Maximum emission rate: tons/yr.	Calculation/ Estimation Method
PM	0.013	0.283	1.238	Manufacturer Guarantee
PM_{10}	0.013	0.283	1.238	Manufacturer Guarantee
SO_x	0.68	0.013	0.056	AP-42
CO	0.0398	0.866	3.792	Manufacturer Guarantee
NO_x	0.012	0.261	1.143	Manufacturer Guarantee
VOC	0.0192	0.418	1.829	Manufacturer Guarantee
HAPs	2.135	0.040	0.176	AP-42

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Stack and Exhauster

Stack Designation/Number S038

List Source(s) or source ID exhausted to this stack:
038

% of flow exhausted to stack: 100

Stack height above grade (ft.) 25.7
Grade elevation (ft.) Approx 1170

Stack diameter (ft) or Outlet duct area (sq. ft.)
2.3

f. Weather Cap
☐ YES ☐ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.
Approx. 650 ft

Does stack height meet Good Engineering Practice (GEP)?
Yes

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions. N/A

Location of stack** Latitude/Longitude Point of Origin	Latitude: Degrees	Latitude: Minutes	Latitude: Seconds	Longitude: Degrees	Longitude: Minutes	Longitude: Seconds
Approximate Location of Cryo III	40	24	13	80	21	34

Stack exhaust
Volume 19,264 lb/hr Temperature 462 °F Moisture N/A %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
N/A

Exhauster (attach fan curves) _____ in. of water _____ HP @ _____RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

Section F - Flue and Air Contaminant Emission

1. Estimated Atmospheric Emissions*

Pollutant	Maximum emission rate: specify units (lb/mmscf) (lb/mmbtu)*	Maximum emission rate: lbs/hr	Maximum emission rate: tons/yr.	Calculation/ Estimation Method
PM	0.013	0.960	4.205	Manufacturer Guarantee
PM_{10}	0.013	0.960	4.205	Manufacturer Guarantee
SO_x	0.68	0.043	0.190	AP-42
CO	0.0398	2.939	12.874	Manufacturer Guarantee
NO_x	0.012	0.886	3.882	Manufacturer Guarantee
VOC	0.0192	1.418	6.210	Manufacturer Guarantee
HAPs	2.135	0.137	0.599	AP-42

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Stack and Exhauster

Stack Designation/Number S039 and S040

List Source(s) or source ID exhausted to this stack:
039 and 040

% of flow exhausted to stack: 100

Stack height above grade (ft.) 30.8
Grade elevation (ft.) Approx 1160

Stack diameter (ft) or Outlet duct area (sq. ft.)
4

f. Weather Cap ☐ YES ☐ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.
Approx. 500 ft

Does stack height meet Good Engineering Practice (GEP)?
Yes

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions. N/A

Location of stack** Latitude/Longitude Point of Origin	Latitude: Degrees	Latitude: Minutes	Latitude: Seconds	Longitude: Degrees	Longitude: Minutes	Longitude: Seconds
Approximate Location of Cryo III	40	24	10	80	21	34

Stack exhaust
Volume 71,950 lb/hr Temperature 585 °F Moisture N/A %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
N/A

Exhauster (attach fan curves) _____ in. of water _____ HP @ _____RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

Section G - Attachments

Number and list all attachments submitted with this application below:

1. General Information Form
2. Plan Approval Application Forms
3. Compliance Review Form
4. Proof of Municipal Notification
5. Permitting Fees
6. Addendum A
7. Process Flow Description and Diagram
8. Site Map
9. Detailed Emission Estimates, including Manufacturer Information and Gas Analysis
10. Supporting Documentation, including:
    - Attachment A - Regulatory Review
    - Attachment B - RACT III Analysis
    - Attachment C - Best Available Technology Analysis
    - Attachment D - LDAR Program/28VHP Boilerplate Conditions
    - Attachment E - Methanol Questionnaire

Compliance Review Form

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR POLLUTION CONTROL ACT COMPLIANCE REVIEW FORM

Fully and accurately provide the following information, as specified. Attach additional sheets as necessary.

Type of Compliance Review Form Submittal (check all that apply)

☐ Original Filing — Date of Last Compliance Review Form Filing:
☒ Amended Filing — 9/26/2023

Type of Submittal

☒ New Plan Approval ☐ New Operating Permit ☐ Renewal of Operating Permit
☐ Extension of Plan Approval ☐ Change of Ownership ☐ Periodic Submission (@ 6 mos)
☐ Other: _____

SECTION A. GENERAL APPLICATION INFORMATION

Name of Applicant/Permittee/("applicant")
(non-corporations-attach documentation of legal name)
MarkWest Liberty Midstream and Resources, L.L.C.

Address 1515 Arapahoe Street, Tower 1, Suite 1600
Denver, CO. 80202-2137

Telephone (303) 925-9200 **Taxpayer ID#** 30-0528059

Permit, Plan Approval or Application ID#

Identify the form of management under which the applicant conducts its business (check appropriate box)

☐ Individual ☐ Syndicate ☐ Government Agency
☐ Municipality ☐ Municipal Authority ☐ Joint Venture
☐ Proprietorship ☐ Fictitious Name ☐ Association
☒ Public Corporation ☐ Partnership ☐ Other Type of Business, specify below:
☐ Private Corporation ☐ Limited Partnership

Describe below the type(s) of business activities performed.

MarkWest Liberty Midstream and Resources, L.L.C. is a natural gas gathering and processing company.

SECTION B. GENERAL INFORMATION REGARDING "APPLICANT"

If applicant is a corporation or a division or other unit of a corporation, provide the names, principal places of business, state of incorporation, and taxpayer ID numbers of all domestic and foreign parent corporations (including the ultimate parent corporation), and all domestic and foreign subsidiary corporations of the ultimate parent corporation with operations in Pennsylvania. Please include all corporate divisions or units, (whether incorporated or unincorporated) and privately held corporations. (A diagram of corporate relationships may be provided to illustrate corporate relationships.) Attach additional sheets as necessary.

Unit Name	Principal Places of Business	State of Incorporation	Taxpayer ID	Relationship to Applicant
MPLX LP	Various	Delaware	27-0005456	Parent
MarkWest Energy Partners, L.P.	Various	Delaware	37-1802743	Subsidiary of MPLX LP
MarkWest Energy Operating Company, L.L.C.	Various	Delaware	27-0005448	Subsidiary of MarkWest Energy Partners, L.P.
MarkWest Liberty Gas Gathering, L.L.C.	Pennsylvania	Delaware	26-2368254	Subsidiary of MarkWest Energy Operating Company, L.L.C.
MarkWest Liberty Midstream & Resources, L.L.C.	Pennsylvania, Ohio, West Virginia	Delaware	30-0528059	***Applicant*** Subsidiary of MarkWest Liberty Gas Gathering, L.L.C.
MarkWest Liberty Bluestone, L.L.C.	Pennsylvania	Delaware	45-5100747	Subsidiary of MarkWest Liberty Midstream & Resources, L.L.C.
MarkWest Liberty Ethane Pipeline, L.L.C.	Pennsylvania, Ohio, West Virginia	Delaware	46-1374029	Subsidiary of MarkWest Liberty Midstream & Resources, L.L.C.
MarkWest Bluestone Ethane Pipeline, L.L.C.	Pennsylvania	Delaware	46-4866522	Subsidiary of MarkWest Liberty Midstream & Resources, L.L.C.
MarkWest Liberty NGL Pipeline, L.L.C.	Pennsylvania, Ohio, West Virginia	Delaware	82-1883261	Subsidiary of MarkWest Liberty Midstream & Resources, L.L.C.
MarkWest Mariner Pipeline, L.L.C.	Pennsylvania	Delaware	45-5147892	Subsidiary of MarkWest Liberty Midstream & Resources, L.L.C.

SECTION C. SPECIFIC INFORMATION REGARDING APPLICANT AND ITS "RELATED PARTIES"

Pennsylvania Facilities. List the name and location (mailing address, municipality, county), telephone number, and relationship to applicant (parent, subsidiary or general partner) of applicant and all Related Parties' places of business, and facilities in Pennsylvania. Attach additional sheets as necessary.

Unit Name	Street Address	County and Municipality	Telephone No.	Relationship to Applicant
Baker CS	151 Baker Station Road	Washington County / Amwell Township	(303) 925-9200	Applicant
Brigich CS	340 Brigich Road	Washington County / Chartiers Township	(303) 925-9200	Applicant
Carpenter CS	265 Old National Pike	Washington County / Donegal Township	(303) 925-9200	Applicant
Down Homes CS	2037 Sunnyhill Road	Washington County / Robinson Township	(303) 925-9200	Applicant
Dryer CS	819 Scenic Drive	Washington County / Independence Township	(303) 925-9200	Applicant
Fulton CS	103 Washington Ave	Washington County / Mt. Pleasant Township	(303) 925-9200	Applicant
Godwin CS	2158 Henderson Ave	Washington County / Canton Township	(303) 925-9200	Applicant
Harmon Creek Gas Plant	123 Point Pleasant Rd	Washington County / Smith Township	(303) 925-9200	Applicant
Hoskins CS	4026 Buffalo Creek Road	Washington County / Blaine Township	(303) 925-9200	Applicant
Houston Gas Plant	800 Western Avenue	Washington County / Chartiers Township	(303) 925-9200	Applicant
Imperial-Cibus Ranch CS	2213 Quiksilver Rd. 2199 Quiksilver Rd.	Washington County / Robinson Township	(303) 925-9200	Applicant
Johnston CS	210 Johnston Hill Road	Washington County / Chartiers Township	(303) 925-9200	Applicant
Lowry CS	100 Oakleaf Rd	Washington County / Hopewell Township	(303) 925-9200	Applicant
McMichael CS	1982 Hookstown Grade Rd.	Washington County / Independence Township	(303) 925-9200	Applicant
Redd CS	576 Redd Run Rd.	Washington County / Amwell Township	(303) 925-9200	Applicant
Shaw CS	492 Arden Mine Rd	Washington County / Chartiers Township	(303) 925-9200	Applicant
Smith CS	320 Point Pleasant Rd	Washington County / Smith Township	(303) 925-9200	Applicant
Stewart CS	185 Avella Road	Washington County / Mt. Pleasant Township	(303) 925-9200	Applicant
Three Brothers CS	858 Atlasburg Road	Washington County / Smith Township	(303) 925-9200	Applicant
Timberlake CS		Washington County / Buffalo Township	(303) 925-9200	Applicant
Tupta Day CS	200 Johnson Rd	Washington County / Amwell Township	(303) 925-9200	Applicant
Welling CS	165 Carlisle Rd	Washington County / Buffalo Township	(303) 925-9200	Applicant
Sarsen Gas Plant	774 Prospect Rd.	Butler County / Forward Township	(303) 925-9200	Subsidiary
Voll CS	318 Woodlands Rd. Evans City, PA	Butler County / Connoquenessing Township	(303) 925-9200	Subsidiary
Trillith CS	222 E Lancaster Rd	Butler County / Lancaster Township	(303) 925-9200	Subsidiary
Royal Oak CS	961 Brownsdale Rd	Butler County / Forward Township	(303) 925-9200	Subsidiary
Bluestone Gas Plant	440 Hartmann Rd.	Butler County / Jackson Township	(303) 925-9200	Subsidiary

Provide the names and business addresses of all general partners of the applicant and parent and subsidiary corporations, if any.

Name	Business Address
MPLX, LP	200 E. Hardin Street, Findlay, OH 45840
MarkWest Energy Partners, L.P.	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO 80202
MarkWest Energy Operating Company, L.L.C.	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO 80202
MarkWest Liberty Gas Gathering, L.L.C.	800 Western Avenue, Washington, PA 15301
MarkWest Liberty Midstream & Resources, L.L.C.	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO 80202
MarkWest Liberty Bluestone, L.L.C.	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO 80202
MarkWest Liberty Ethane Pipeline, L.L.C.	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO 80202
MarkWest Liberty Bluestone Ethane Pipeline, L.L.C.	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO 80202
MarkWest Liberty NGL Pipeline, L.L.C.	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO 80202
MarkWest Mariner Pipeline, L.L.C.	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO 80202

List the names and business address of persons with overall management responsibility for the process being permitted (i.e. plant manager).

Name	Business Address
Robert W. Shough, Operations Director, G&P East	4600 J. Barry Ct., Canonsburg, PA. 15317
Harold Rinehart, VP Operations Processing	4600 J. Barry Ct., Canonsburg, PA. 15317
Jonathan C. Jackson, VP Eastern Region G&P	4600 J. Barry Ct., Canonsburg, PA. 15317
Gregory S. Floerke, EVP & COO MPLX	1515 Arapahoe St, Tower 1, Suite 1600, Denver, CO. 80016

Plan Approvals or Operating Permits. List all plan approvals or operating permits issued by the Department or an approved local air pollution control agency under the APCA to the applicant or related parties that are currently in effect or have been in effect at any time 5 years prior to the date on which this form is notarized. This list shall include the plan approval and operating permit numbers, locations, issuance and expiration dates. Attach additional sheets as necessary.

Air Contamination Source	Plan Approval/ Operating Permit#	Location	Issuance Date	Expiration Date
Houston Gas Plant	PA-63-00936F	800 Western Ave	10/4/2012	4/2019 (Renewal Submitted 10/25/2018) (Plan Approval Submitted 4/27/2021)
Baker CS	GP5-63-00960E/AG5-63-00013A & GP9-63-00960B	151 Baker Station Road	6/28/2021	6/28/2026
Brigich CS	GP5-63-00954C	340 Brigich Road	5/11/2022	5/11/2027
Carpenter CS	GP5-63-00987A	265 Old National Pike	11/30/2022	11/30/2027
Down Homes CS	GP5-63-1009A	2037 Sunnyhill Road	6/30/2022	6/30/2027
Dryer CS	SOOP-63-00942	819 Scenic Drive	10/13/2020	10/13/2025

Fulton CS	SOOP-63-00937	103 Washington Ave	10/13/2020	10/13/2025
Godwin CS	SOOP-63-00934	2158 Henderson Ave	7/29/2021	7/29/2026
Harmon Creek Gas Plant	GP5-63-01011B PA-63-01011	123 Point Pleasant Rd	6/29/2022 4/12/2023	6/29/2027 3/28/2024
Hoskins CS	GP5-63-00938B	4026 Buffalo Creek Road	6/28/2022	6/28/2027
Imperial-Cibus Ranch CS	GP5-63-00992A	2213 Quiksilver Rd. 2199 Quiksilver Rd.	3/22/2022	3/22/2027
Johnston CS	SOOP-63-00933	210 Johnston Hill Road	3/22/2022	3/22/2027
Lowry CS	GP5-63-00947B	100 Oakleaf Rd	9/20/2022	9/20/2027
McMichael CS	GP5-04-00747	1982 Hookstown Grade Rd.	12/14/2023	12/14/2028
Redd CS	GP5-63-00962	576 Redd Run Rd.	7/2/2021	7/2/2026
Shaw CS	GP5-63-00940C	492 Arden Mine Rd	7/26/2022	7/26/2027
Smith CS	SOOP-63-00962	320 Point Pleasant Rd	Issued: 12/2/2019 Modified: 3/22/2022	12/2/2024
Stewart CS	SOOP-63-00939	185 Avella Road	7/6/2021	7/6/2026
Timberlake CS	GP5-63-01064/ AG5-63-00022A	305 Timberlake Road	7/30/2022	7/30/2027
Three Brothers CS	GP5-63-00969	858 Atlasburg Road	3/18/2019	3/18/2024
Tupta Day CS	GP5-63-00948E	200 Johnson Rd	1/10/2022	1/10/2027
Welling CS	GP5-00958A	165 Carlisle Rd	8/2/2022	8/2/2027
Sarsen Gas Plant	SOOP 10-00359	774 Prospect Rd.	12/03/2013	1/31/2024
Voll CS	SOOP-10-00367	318 Woodlands Rd. Evans City, PA	9/9/2020	8/31/2025
Trillith CS	GP5-10-370F	Southeast of intersection of Highway 79 an E Lancaster Rd	7/21/2022	6/30/2027
Royal Oak CS	SOOP 10-00390	961 Brownsdale Rd	12/16/2019	11/30/2024
Bluestone Gas Plant	TV-10-00368 PA-10-368G	440 Hartmann Rd.	11/3/2020	1/31/2025

Compliance Background. (Note: Copies of specific documents, if applicable, must be made available to the Department upon its request.) List all documented conduct of violations or enforcement actions identified by the Department pursuant to the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. Attach additional sheets as necessary. See the definition of "documented conduct" for further clarification. Unless specifically directed by the Department, deviations which have been previously reported to the Department in writing, relating to monitoring and reporting, need not be reported.

Date	Location	Plan Approval/ Operating Permit#	Nature of Documented Conduct	Type of Department Action	Status: Litigation Existing/Continuing or Corrected/Date	Dollar Amount Penalty
8/1/2023	Houston	63-00936F	Exceedance of 12-month rolling limit	Notice of Violation	Corrected/ 12/15/2022	N/A
11/14/2021	Houston	63-00936F	Failure to Operate and maintain a source or control device in accordance with the specifications	Notice of Violation	Corrected/Abated 1/14/2022 Penalty Paid: 12/16/2022	$7,832
2/6/2021	Houston	63-00936F	Visible emissions event	Notice of Violation	Corrected/Abated 2/16/2021	N/A
				Consent Assessment of Civil Penalty	Penalty Final Date: 10/6/2021	$5,200
11/23/2020	Houston	63-00936F	Visible emissions event	Notice of Violation	Corrected/Abated 11/23/2020	N/A
				Consent Assessment of Civil Penalty	Penalty Final Date: 10/6/2021	$5,200
7/9/2018	Houston	63-00936F	Powers and duties or DEP	Consent Decree	See Consent Decrees in Section Below	N/A
4/29/2021 4/23/2021 3/8/2021 1/25/2021	Harmon Creek	63-01011B	Failure to prevent visible emissions into the atmosphere	Notice of Violation	Corrected/Abated 4/23/2021	N/A
				Consent Assessment of Civil Penalty	Penalty Final Date: 10/5/2022	$5,400
9/6/2021	Down Homes CS Shaw CS Stewart CS	63-01009B 63-00940 63-00939	LDAR deviations	Notice of Violation	Corrected/Abated 3/22/2021	N/A
				Consent Assessment of Civil Penalty	Penalty Final Date: 10/6/2021	$19,500
10/2/2019	Smith CS Three Brothers CS	63-00968 63-00969	Failure to perform fractional analysis at inlet	Notice of Violation	Corrected/Abated 10/2/2019	N/A
				Consent Assessment of Civil Penalty	4/29/2020	$14,600
1/18/2019	Bluestone Gas Plant	10-00368	Powers and duties or DEP	Consent Decree	See Consent Decrees in Section Below	N/A
1/17/2019	Royal Oak CS Sarsen Gas Plant Bluestone Gas Plant	10-00390 10-00359 10-00368	Failure to submit operating permit fees	Notice of Violation	Corrected	N/A

List all incidents of deviations of the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. This list must include items both currently known and unknown to the Department. Attach additional sheets as necessary. See the definition of "deviations" for further clarification.

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation	Incident Status: Litigation Existing/Continuing Or Corrected/Date
July 6, 2015	Various	--	Pig Launcher/Receiver Permitting	Signed Consent Decree with USEPA and PADEP. 7/19/2018
2016	Houston Plant and Other Gas Plants	PA-63-00936F	LDAR	Signed Consent Decree with USEPA and PADEP. 1/9/2019
March 23, 2017	Sarsen Gas Processing Plant	SOOP 10-00359	NSPS Subpart KKK	Signed Consent Decree with USEPA. 3/26/2017
August 28, 2020	Sarsen Gas Processing Plant	SOOP 10-00359	NSPS Subpart OOOO LDAR	Signed Consent Agreement and Final Order with USEPA. Filed 8/28/2020.

CONTINUING OBLIGATION. Applicant is under a continuing obligation to update this form using the Compliance Review Supplemental Form if any additional deviations occur between the date of submission and Department action on the application.

VERIFICATION STATEMENT

Subject to the penalties of Title 18 Pa.C.S. Section 4904 and 35 P.S. Section 4009(b)(2), I verify under penalty of law that I am authorized to make this verification on behalf of the Applicant/Permittee. I further verify that the information contained in this Compliance Review Form is true and complete to the best of my belief formed after reasonable inquiry. I further verify that reasonable procedures are in place to ensure that "documented conduct" and "deviations" as defined in 25 Pa Code Section 121.1 are identified and included in the information set forth in this Compliance Review Form.

Signature	Date: 1/18/24
Robert W. Shough	
Name (Print or Type)	
Operations Director	
Title	

Proof of Municipal Notification

MarkWest Liberty Midstream and Resources, L.L.C.
1515 Arapahoe Street
Tower 1, Suite 1600
Denver, CO 80202-2137
(800) 730-8388
(303) 925-9200
(303) 825-0902 Fax

January 17, 2024

UPS Tracking Number: 1Z2E23250191746379

Washington County Commissioners
Courthouse Square
100 West Beau Street
Suite 702
Washington, PA 15301

Re: MarkWest Liberty Midstream and Resources, L.L.C.
Harmon Creek Gas Plant
Plan Approval Application

Dear Commissioners:

This letter is being sent to notify the County Commissioners that MarkWest Liberty Midstream and Resources, L.L.C (MPLX) has applied to the Pennsylvania Department of Environmental Protection (PADEP) for an Air Quality Plan Approval for the Harmon Creek Gas Plant, located at 123 Point Pleasant Rd in Smith Township, Washington County, Pennsylvania.

MPLX seeks authorization to install and operate equipment associated with Harmon Creek Cryo III with a processing capacity of 330 MMSCFD and DeEthanizer II. In addition to the equipment currently authorized at the facility, MPLX proposes the installation and operation of the following air emission sources at the facility:

- One (1) cryogenic plant regenerative heater rated at a maximum heat input of 21.75 MMBtu/hr equipped with flue gas recirculation (FGR);
- Two (2) deethanizer hot medium oil (HMO) heaters rated at a maximum heat input of 73.85 MMBtu/hr equipped with FGR;
- One (1) 500-gallon methanol storage tank;
- One (1) high-pressure pig receiver controlled by the process flare;
- Three (3) electric-driven centrifugal compressors and associated dry gas venting;
- One (1) electric-driven reciprocating compressor; and
- Associated fugitive components.

De minimis emission increases associated with truck loadout operations, in addition to emissions from maintenance blowdowns and some pressure relief devices, where feasible, will be controlled by the existing process flare.

This notice is being provided in accordance with the requirements of 25 Pa. Code § 127.413 for municipal notification.

There is a 30-day comment period which begins upon receipt of this notice by the county. Anyone wishing to view this application may do so by making arrangements with:

Air Quality Program
PADEP - Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA. 15222
(412) 442-4000

If you have any questions about this application, please contact me at (412) 815-8886 or via email at ajuarez@marathonpetroleum.com.

Sincerely,

Alexandra M. Juarez
Environmental Engineer

cc: MarkWest file

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number

1Z2E23250191746379

Weight

1.00 LBS

Service

UPS Next Day Air®

Shipped / Billed On

01/15/2024

Delivered On

01/19/2024 10:19 A.M.

Delivered To

WASHINGTON, PA, US
Received By

MEEK

Please print for your records as photo and details are only available for a limited time.

Sincerely,

UPS

Tracking results provided by UPS: 01/19/2024 10:28 A.M. EST

MarkWest Liberty Midstream and Resources, L.L.C.
1515 Arapahoe Street
Tower 1, Suite 1600
Denver, CO 80202-2137
(800) 730-8388
(303) 925-9200
(303) 825-0902 Fax

January 17, 2024

UPS Tracking Number: 1Z2E2325NP98261329

Township Supervisors
Smith Township
1848 Smith Township State Road
Slovan, PA. 15078

Re: MarkWest Liberty Midstream and Resources, L.L.C.
Harmon Creek Gas Plant
Plan Approval Application

Dear Supervisors:

This letter is being sent to notify the Township Supervisors that MarkWest Liberty Midstream and Resources, L.L.C (MPLX) has applied to the Pennsylvania Department of Environmental Protection (PADEP) for an Air Quality Plan Approval for the Harmon Creek Gas Plant, located at 123 Point Pleasant Rd in Smith Township, Washington County, Pennsylvania.

MPLX seeks authorization to install and operate equipment associated with Harmon Creek Cryo III with a processing capacity of 330 MMSCFD and DeEthanizer II. In addition to the equipment currently authorized at the facility, MPLX proposes the installation and operation of the following air emission sources at the facility:

- One (1) cryogenic plant regenerative heater rated at a maximum heat input of 21.75 MMBtu/hr equipped with flue gas recirculation (FGR);
- Two (2) deethanizer hot medium oil (HMO) heaters rated at a maximum heat input of 73.85 MMBtu/hr equipped with FGR;
- One (1) 500-gallon methanol storage tank;
- One (1) high-pressure pig receiver controlled by the process flare;
- Three (3) electric-driven centrifugal compressors and associated dry gas venting;
- One (1) electric-driven reciprocating compressor; and
- Associated fugitive components.

De minimis emission increases associated with truck loadout operations, in addition to emissions from maintenance blowdowns and some pressure relief devices, where feasible, will be controlled by the existing process flare.

This notice is being provided in accordance with the requirements of 25 Pa. Code § 127.413 for municipal notification.

There is a 30-day comment period which begins upon receipt of this notice by the county. Anyone wishing to view this application may do so by making arrangements with:

Air Quality Program
PADEP - Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA. 15222
(412) 442-4000

If you have any questions about this application, please contact me at (412) 815-8886 or via email at ajuarez@marathonpetroleum.com.

Sincerely,

Alexandra M. Juarez
Environmental Engineer

cc: MarkWest file

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number

1Z2E2325NP98261329

Service

UPS Next Day Air® Early

Shipped / Billed On

01/17/2024

Delivered On

01/19/2024 7:52 A.M.

Delivered To

SLOVAN, PA, US
Received By

KRIZNIK

Please print for your records as photo and details are only available for a limited time.

Sincerely,

UPS

Tracking results provided by UPS: 01/19/2024 8:40 A.M. EST

Permitting Fee Form

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR QUALITY FEES FOR NEW PLAN APPROVAL

Company Information	
Federal Tax ID: 30-0528059	Firm Name: MarkWest Liberty Midstream and Resources, L.L.C.
Permit # (If any): 63-01011A	Facility Name: Harmon Creek Gas Plant
Municipality: Smith Township	County: Washington
Contact Person Name: Allie Juarez	Telephone Number: 412-815-8886
E-mail: ajuarez@marathonpetroleum.com	

New Plan Approval (The following fees are cumulative.)

Line #	Check the appropriate boxes below	Type of review requested	Fee 2021 - 2025	Total Fees
1	Base Fee	Subchapter B	$2,500	$2,500
2	☐	New Source Review, Subchapter E	$7,500	
3	☒	NSPS/NESHAP /MACT standard A. # of NSPS: (Dc, OOOOb) 2 B. # of NESHAP/MACT: ____ C. Add lines A and B: ____ D. Maximum applicable standards: 3 E. Enter smaller of line C or line D: 2 Multiply line E by $2,500 and enter the amount in the "Total Fees" column.	$5,000	$5,000
4	☐	Case-by-Case MACT	$9,500	
5	☐	Prevention of Significant Deterioration (PSD) requirements. Subchapter D	$32,500	
6	☐	Plantwide Applicability Limit (PAL) for NSR regulated pollutants or PAL for PSD regulated pollutants or both	$7,500	
7	☐	Risk Assessment Analysis – Inhalation only	$10,000	
8	☐	Risk Assessment Analysis – Multi-pathway	$25,000	
Add Lines 1 thru 8 of Total Fees column and write it here. →				$7,500

Addendum A

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum A: Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.
Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Group #1 (Combustion Source >10 MMBtu/hr and <50 MMBtu/hr, Source IDs 038)
Group #2 (Combustion Source >10 MMBtu/hr and <100 MMBtu/hr, Source IDs 039 and 040)
Group #3 (Centrifugal Compressors, Source ID 602)
Group #4 (Fugitive Components, Source ID 701)

Citation Number	Citation Limitation	Limitation Used
25 Pa. Code 123.11 (Entire site and Group #1)	0.4 lb/MMBtu of PM for combustion unit between 2.5 MMBtu/hr and 50 MMBtu/hr	0.013 lb/MMBtu
25 Pa. Code 127.12b (Group #2)	BAT Conditions for NOx and CO	NA
25 Pa. Code 123.22 (Entire site and Group #2)	4.0 lb/MMBtu of SO_2 over a 1-hour period	NA
25 Pa. Code 123.41 (Entire site, Group #2)	Visible emissions may not be equal to or greater than 20% for 3 mins in 1 hour or may not be equal to or greater than 60% at any time.	NA
40 CFR Part 60 Subpart Dc (Group #2)	Recordkeeping and Reporting Requirements	NA
40 CFR Part 60 Subpart OOOOb (Group #3)	Volumetric flow measurement	NA
40 CFR Part 60 Subpart OOOOb (Group #4)	Equipment Leak Standards	NA
25 Pa. Code 123.1 (Entire site)	Prohibition of Fugitive Emissions	NA
25 Pa. Code 123.2 (Entire site)	Fugitive particulate matter outside property	NA
25 Pa. Code 123.13 (Entire site)	Process Particulate Emissions	NA
25 Pa. Code 123.14 (Entire site)	Open Burning Requirements	NA
25 Pa. Code 123.21 (Entire site)	500 ppmv SO_2	NA
25 Pa. Code 123.31	Odor Emissions	NA

(Entire site)		
25 Pa. Code 127.12b (Source ID 702)	Recordkeeping and Report Requirements	NA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	30-0528059	**Firm Name:**	MarkWest Liberty Midstream & Resources, LLC
Plant Code:		**Plant Name:**	Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☒ **The entire site**

☒ **A group of sources, Group ID:** Group #1 (Combustion Source >10 MMBtu/hr and <50 MMBtu/hr, Source IDs 039)

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 25 Pa. Code § 123.11

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

1. Monitoring device type (stack test, CEM, etc.):

2. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. How will data be reported:

Section 3: Testing

1. Reference Test Method Description:

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Keep records of gas combusted and use the AP-42 PM emission factor to demonstrate compliance with the limitation

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	30-0528059	**Firm Name:**	MarkWest Liberty Midstream & Resources, LLC
Plant Code:		**Plant Name:**	Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☒ **A group of sources, Group ID:** Group #2 (Combustion Source >10 MMBtu/hr and <100 MMBtu/hr, Source IDs 039 and 040)

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 25 Pa. Code § 123.12b

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

4. Monitoring device type (stack test, CEM, etc.):

5. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

6. How will data be reported:

Section 3: Testing

3. Reference Test Method Description:

4. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Keep records of gas combusted and use guaranteed emission factor to demonstrate compliance with the limitations

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

2. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Operate heater in accordance with manufacturers specificationsand conduct recommended tune-up/inspections to ensure compliance

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	30-0528059	**Firm Name:**	MarkWest Liberty Midstream & Resources, LLC
Plant Code:		**Plant Name:**	Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☒ **The entire site**

☒ **A group of sources, Group ID:** Group #2 (Combustion Source >10 MMBtu/hr and <100 MMBtu/hr, Source IDs 039 and 040)

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 25 Pa. Code § 123.22

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

7. Monitoring device type (stack test, CEM, etc.):

8. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

9. How will data be reported:

Section 3: Testing

5. Reference Test Method Description:

6. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Keep records of gas combusted and sulfur content to demonstrate compliance with the limitation

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

3. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	30-0528059	**Firm Name:**	MarkWest Liberty Midstream & Resources, LLC
Plant Code:		**Plant Name:**	Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☒ **The entire site**

☒ **A group of sources, Group ID:** Group #2 (Combustion Source >10 MMBtu/hr and <100 MMBtu/hr, Source IDs 039 and 040)

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 25 Pa. Code § 123.41

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☒ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

10. Monitoring device type (stack test, CEM, etc.): Observations using Method 9 or Method 22

11. Monitoring device location: NA

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Opacity of emissions

12. How will data be reported: NA

Section 3: Testing

7. Reference Test Method Description:

8. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Maintain log of visible emissions observations

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

4. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	30-0528059	**Firm Name:**	MarkWest Liberty Midstream & Resources, LLC
Plant Code:		**Plant Name:**	Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☒ **A group of sources, Group ID:** Group #2 (Combustion Source >10 MMBtu/hr and <100 MMBtu/hr, Source IDs 039 and 040)

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 40 CFR Part 60 Subpart Dc

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☒ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

13. Monitoring device type (stack test, CEM, etc.):

14. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

15. How will data be reported:

Section 3: Testing

9. Reference Test Method Description:

10. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Keep records of hours operated/gas combusted per §60.48c(g)(2)

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

Notification of the construction start date within 30 days and start up notification within 15 days (§60.7(a)(1) and (3))

Notification 60 days prior to any physical or operational change that increases emissions unless exempt (§60.7(a)(4))

5. Reporting start date: Specified above

Section 6: Work Practice Standard

Describe any work practice standards:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	30-0528059	**Firm Name:**	MarkWest Liberty Midstream & Resources, LLC
Plant Code:		**Plant Name:**	Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☒ **A group of sources, Group ID:** Group #3 (Centrifugal Compressors, Source ID 602)

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 40 CFR Part 60 Subpart OOOOb

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☒ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

16. Monitoring device type (stack test, CEM, etc.): As required under per §60.5380b(a)(6)

17. Monitoring device location: Dry seal vents

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Volumetric measurements as required under per §60.5380b(a)(6)

18. How will data be reported: See Reporting

Section 3: Testing

11. Reference Test Method Description:

12. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Records as required per §60.5420b(c)(4), (8), and (13)

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

Submit reports per §60.5420b(b)(1),(5), and (11)

6. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Repair any emission rate exceedances as required under §60.5380b(a)(8)

As an alternative to the monitoring requirements, reduce VOC and methane emissions by 95% per §60.5380b(a)(9)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	30-0528059	**Firm Name:**	MarkWest Liberty Midstream & Resources, LLC
Plant Code:		**Plant Name:**	Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☒ **A group of sources, Group ID:** Group #4 (Fugitive Components, Source ID 701)

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 40 CFR Part 60 Subpart OOOOb

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☒ **Monitoring** ☐ **Testing** ☒ **Reporting**

☐ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

19. Monitoring device type (stack test, CEM, etc.): LDAR Program – See Attachment D

20. Monitoring device location: Fugitive components

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Monitoring frequency meeting requirements per §60.5400b depending on monitoring method

21. How will data be reported: See Reporting Below

Section 3: Testing

13. Reference Test Method Description:

14. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Maintain records of LDAR program monitoring per §60.5420b(c)(8), (10), and (12) and §60.5421b

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

Notification of the construction start date within 30 days and start up notification within 15 days (§§60.7(a)(1) and (3))

Submit semiannual reports per §60.5420b(b)(1) and (11) and §60.5422b

7. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Make repairs in accordance with §60.5400b

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	30-0528059	**Firm Name:**	MarkWest Liberty Midstream & Resources, LLC
Plant Code:		**Plant Name:**	Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☒ **The entire site**

☐ **A group of sources, Group ID:**

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 25 Pa. Code 123.1 (Prohibition of Fugitive Emissions)

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☒ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

22. Monitoring device type (stack test, CEM, etc.): Observations

23. Monitoring device location: Varies

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Fugitive emissions

24. How will data be reported: NA

Section 3: Testing

15. Reference Test Method Description:

16. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Log of observations

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

8. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Take actions to minimize fugitive emissions

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	30-0528059	**Firm Name:**	MarkWest Liberty Midstream & Resources, LLC
Plant Code:		**Plant Name:**	Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☒ **The entire site**

☐ **A group of sources, Group ID:**

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 25 Pa. Code 123.2 (Fugitive PM Emissions Outside Property)

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☒ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

25. Monitoring device type (stack test, CEM, etc.): Observations

26. Monitoring device location: Varies

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Fugitive emissions

27. How will data be reported: NA

Section 3: Testing

17. Reference Test Method Description:

18. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Log of observations

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

9. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Take actions to minimize fugitive emissions

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id: 30-0528059 **Firm Name:** MarkWest Liberty Midstream & Resources, LLC

Plant Code: **Plant Name:** Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☒ **The entire site**

☐ **A group of sources, Group ID:**

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 25 Pa. Code 123.13 Process Particulate Emissions

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☐ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

28. Monitoring device type (stack test, CEM, etc.):

29. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

30. How will data be reported:

Section 3: Testing

19. Reference Test Method Description:

20. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

Keep records of gas combusted and use the AP-42 PM emission factor to demonstrate compliance with the limitation

10. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Operate in accordance with manufacturers specifications to minimize particulate emissions

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id: 30-0528059 **Firm Name:** MarkWest Liberty Midstream & Resources, LLC

Plant Code: **Plant Name:** Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☒ **The entire site**

☐ **A group of sources, Group ID:**

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 25 Pa. Code 123.14 Open Burning Requirements

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☐ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

31. Monitoring device type (stack test, CEM, etc.):

32. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

33. How will data be reported:

Section 3: Testing

21. Reference Test Method Description:

22. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

11. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Open burning allowed only as approved (ex. - fire training exercises)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id: 30-0528059 **Firm Name:** MarkWest Liberty Midstream & Resources, LLC

Plant Code: **Plant Name:** Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☒ **The entire site**

☐ **A group of sources, Group ID:**

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 25 Pa. Code 123.21 Process SO_2 Emissions

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

34. Monitoring device type (stack test, CEM, etc.):

35. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

36. How will data be reported:

Section 3: Testing

23. Reference Test Method Description:

24. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Keep records of sulfur content of gas

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

12. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	30-0528059	**Firm Name:**	MarkWest Liberty Midstream & Resources, LLC
Plant Code:		**Plant Name:**	Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☒ **The entire site**

☐ **A group of sources, Group ID:**

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 25 Pa. Code 123.31 Odor Emissions

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☒ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

37. Monitoring device type (stack test, CEM, etc.): Observations

38. Monitoring device location: Property line

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Odors

39. How will data be reported: NA

Section 3: Testing

25. Reference Test Method Description:

26. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Keep logs of observations for malodors crossing the property line

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

13. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Operate in accordance with manufacturers specifications to minimize particulate emissions

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id: 30-0528059 **Firm Name:** MarkWest Liberty Midstream & Resources, LLC

Plant Code: **Plant Name:** Harmon Creek Gas Plant

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** 702 – Truck Loadout

☐ **Alternative Scenario, Scenario Name:**

Citation #: 25 Pa. Code § 123.12b

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

40. Monitoring device type (stack test, CEM, etc.):

41. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

42. How will data be reported:

Section 3: Testing

27. Reference Test Method Description:

28. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Keep records of liquids loaded from 702 on 12-month rolling basis

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

14. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Route loadout emissions to the flare during truck loadout operations

Process Flow Description & Diagram

Process Flow Narrative
Harmon Creek

The Harmon Creek Gas Plant receives dehydrated and compressed natural gas from upstream gathering compressor station(s) for processing. The processing includes extracting natural gas liquids from the field gas and partial fractionation of the mixed natural gas liquids (NGLs) to natural gas products. The fractionation equipment at Harmon Creek includes stabilization, cryogenic separation, and de-ethanization fractionation. Because these processes are closed loop, the primary emission points (besides combustion emissions from the process heaters) are fugitive emissions from component leaks. Other emission sources include process safety valves (PSV) and maintenance depressurization which are controlled by the flare. The air-assisted elevated plant flare is used to control emissions from numerous process safety valves and vents throughout the plant as well as emissions from the pig launchers/receivers. The flare manufacturer, John Zink, designed the process flare to achieve a minimum DRE of 98% under the specific process conditions of Harmon Creek.

Stabilization Unit

As raw, wellhead gas traverses the Harmon Creek inlet system, the heavier components of the stream will condense and restrict flow. Regular pigging of inlet piping pushes the condensate into collection vessels known as Slug Catchers. The Slug Catchers house the condensate until enough inventory exists for Stabilizer operation. During Stabilizer operation, the condensate is fed to a Three Phase Separator where water, vapor, and condensate are separated. The water, oftentimes contaminated with sludge and triethylene glycol, is disposed of in the facility Closed Drain Tank and trucked out as needed. The condensate is sent to the Stabilizer tower for separation of light-end hydrocarbon from the heavier liquid. The light-end hydrocarbon, which flows from the overhead of the Stabilizer tower, is combined with vapor from the Three Phase Separator, compressed, and injected into the facility's inlet gas stream for Cryogenic processing. The Stabilizer tower liquid, similar in composition to C3+, flows to the C3+ Surge Tank and is pumped to the Houston facility for further fractionation.

Cryogenic Processing Plants

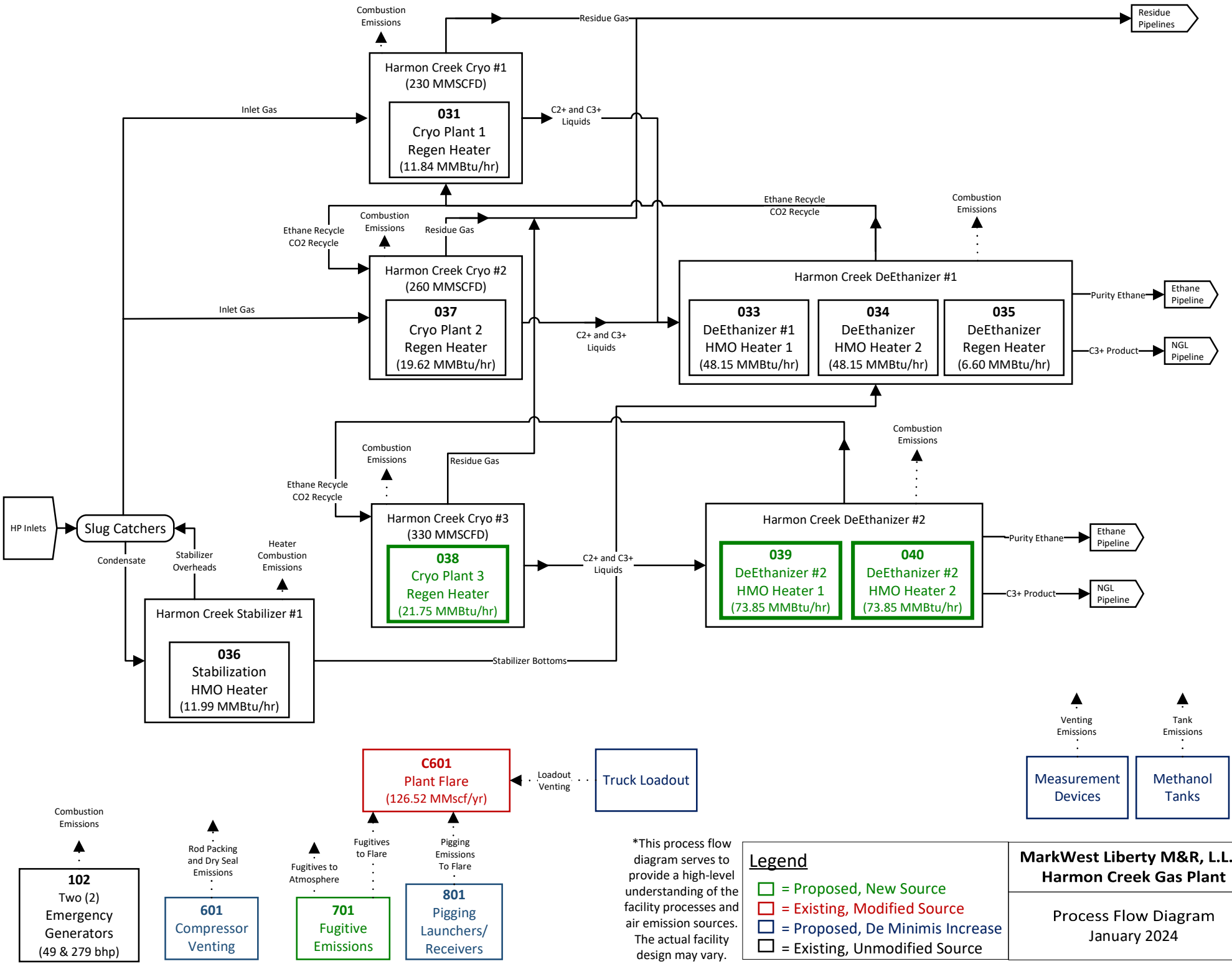
The cryogenic processing plants utilize a mole sieve to dry incoming gas and electrically driven compressors to cool the gas to facilitate separation of ethane and heavier hydrocarbon liquids from methane gas (i.e. it acts as a de-methanizer). The cryogenic plants receive field gas at high pressure from various producers that has undergone compression and dehydration at upstream compressor station(s). Upon arrival at Harmon Creek, the gas enters a molecular sieve tower which removes any remaining entrained water to prevent hydrates in the subsequent cryogenic process. The removal of the entrained water works by passing the gas through a tower packed with material that has a high affinity for water so that the water is removed from the gas stream by absorbing into the media. Three towers of each unit are used in parallel with two receiving gas while the third is being regenerated. The regenerative heaters are used to heat dry natural gas which desorbs the water from the media thus regenerating the tower and making it available for dewatering of the inlet gas. The gas used for regeneration is then cooled to condense the water and remove it from the system, after which the gas is re-routed to the inlet of the plant for processing. The streams leaving the cryogenic units consist of residue methane gas sent to the pipeline for distribution and C2+ liquids sent to the de-ethanizers. Emission points associated with the cryogenic plants include combustion emissions from the three (3) regenerative heaters (031,

037, and 038), fugitive emissions from component leaks (701), and rod packing emissions from the electric-driven compressors (601).

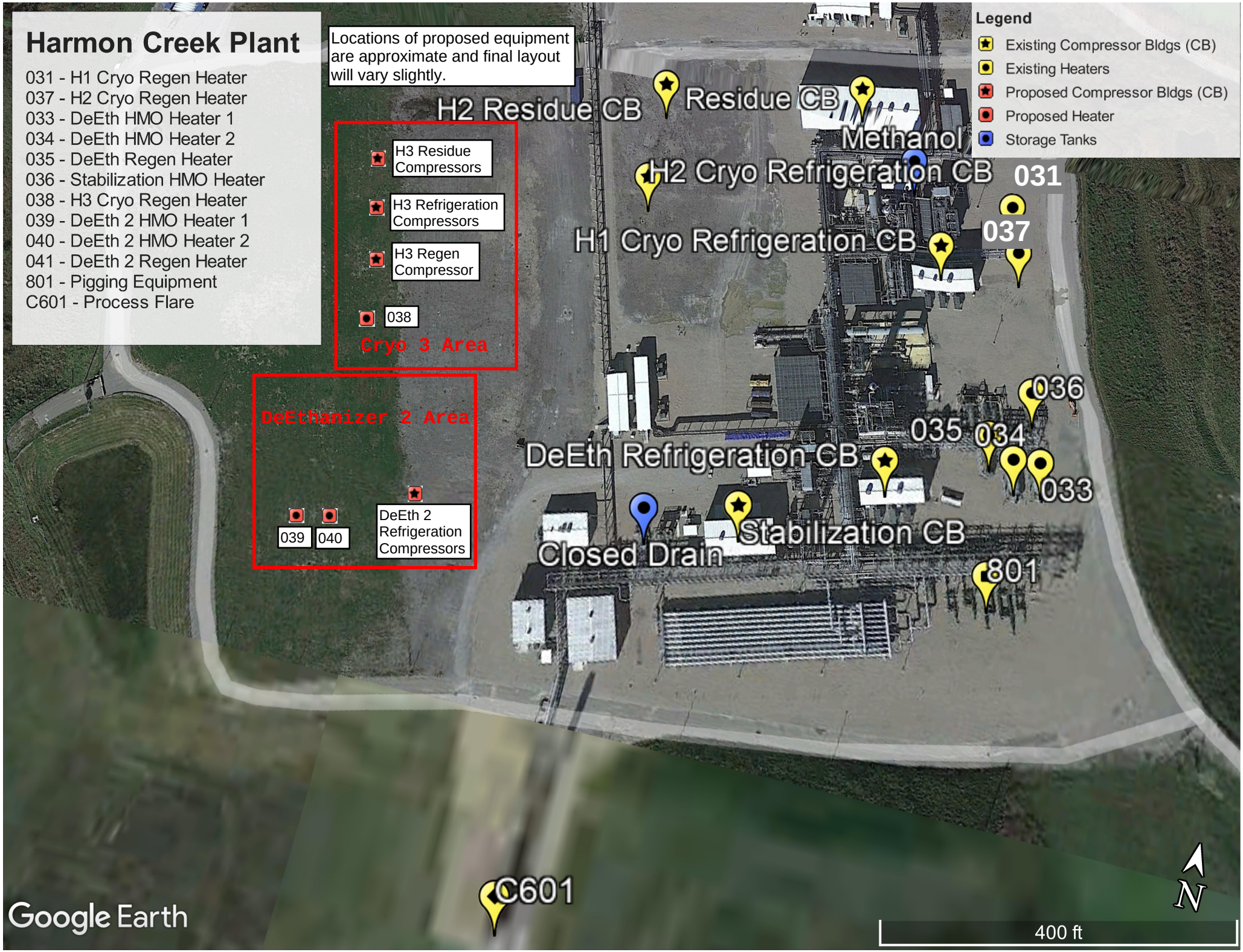
De-Ethanization Plant

Liquids from the cryogenic plants enter the de-ethanizers to separate out pure ethane from the C3+ hydrocarbons. The lighter ethane leaves through the top of the tower and is pumped to the ethane sales line. The heavier C3+ liquids collect at the bottom of the tower and are sent via pipeline for further processing (primarily at the Houston Gas Plant). Emission sources associated with the de-ethanizers include combustion emissions from the four (4) HMO heaters (033, 034, 039, and 040), one (1) regenerative heater (035), and fugitive emissions from component leaks (701).

There are two (2) emergency generators (102) onsite. These units provide backup power to the administrative building and control room in the event of a power outage.


Combustion Emissions
Residue Gas
Residue Pipelines
Harmon Creek Cryo #1
(230 MMSCFD)
031
Cryo Plant 1
Regen Heater
(11.84 MMBtu/hr)
Inlet Gas
C2+ and C3+ Liquids
Ethane Recycle
CO2 Recycle
Combustion Emissions
Residue Gas
Harmon Creek Cryo #2
(260 MMSCFD)
037
Cryo Plant 2
Regen Heater
(19.62 MMBtu/hr)
Inlet Gas
C2+ and C3+ Liquids
Ethane Recycle
CO2 Recycle
Combustion Emissions
Harmon Creek DeEthanizer #1
033
DeEthanizer #1
HMO Heater 1
(48.15 MMBtu/hr)
034
DeEthanizer
HMO Heater 2
(48.15 MMBtu/hr)
035
DeEthanizer
Regen Heater
(6.60 MMBtu/hr)
Purity Ethane
Ethane Pipeline
C3+ Product
NGL Pipeline
Combustion Emissions
Residue Gas
Ethane Recycle
CO2 Recycle
Harmon Creek Cryo #3
(330 MMSCFD)
038
Cryo Plant 3
Regen Heater
(21.75 MMBtu/hr)
C2+ and C3+ Liquids
Combustion Emissions
Harmon Creek DeEthanizer #2
039
DeEthanizer #2
HMO Heater 1
(73.85 MMBtu/hr)
040
DeEthanizer #2
HMO Heater 2
(73.85 MMBtu/hr)
Purity Ethane
Ethane Pipeline
C3+ Product
NGL Pipeline
HP Inlets
Slug Catchers
Condensate
Stabilizer Overheads
Heater Combustion Emissions
Harmon Creek Stabilizer #1
036
Stabilization
HMO Heater
(11.99 MMBtu/hr)
Stabilizer Bottoms
Venting Emissions
Tank Emissions
Measurement Devices
Methanol Tanks
C601
Plant Flare
(126.52 MMscf/yr)
Loadout Venting
Truck Loadout
Combustion Emissions
102
Two (2)
Emergency
Generators
(49 & 279 bhp)
Rod Packing and Dry Seal Emissions
601
Compressor
Venting
Fugitives to Atmosphere
Fugitives to Flare
701
Fugitive
Emissions
Pigging Emissions To Flare
801
Pigging
Launchers/
Receivers
*This process flow diagram serves to provide a high-level understanding of the facility processes and air emission sources. The actual facility design may vary.
Legend
= Proposed, New Source
= Existing, Modified Source
= Proposed, De Minimis Increase
= Existing, Unmodified Source
MarkWest Liberty M&R, L.L.C.
Harmon Creek Gas Plant
Process Flow Diagram
January 2024

Site Map


Harmon Creek Plant
031 - H1 Cryo Regen Heater
037 - H2 Cryo Regen Heater
033 - DeEth HMO Heater 1
034 - DeEth HMO Heater 2
035 - DeEth Regen Heater
036 - Stabilization HMO Heater
038 - H3 Cryo Regen Heater
039 - DeEth 2 HMO Heater 1
040 - DeEth 2 HMO Heater 2
041 - DeEth 2 Regen Heater
801 - Pigging Equipment
C601 - Process Flare
Locations of proposed equipment are approximate and final layout will vary slightly.
Legend
Existing Compressor Bldgs (CB)
Existing Heaters
Proposed Compressor Bldgs (CB)
Proposed Heater
Storage Tanks
H2 Residue CB
Residue CB
Methanol
H2 Cryo Refrigeration CB
031
H1 Cryo Refrigeration CB
037
H3 Residue Compressors
H3 Refrigeration Compressors
H3 Regen Compressor
038
Cryo 3 Area
DeEthanizer 2 Area
036
035
034
033
DeEth Refrigeration CB
039
040
DeEth 2 Refrigeration Compressors
Closed Drain
Stabilization CB
801
C601
Google Earth
N
400 ft

Detailed Emission Estimates

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant

Summary of Potential Emissions

Criteria Pollutant Potential Emissions

Process/Facility	Source ID	Potential Emissions (lb/hr)					
		NOx	CO	VOC	SO_2	PM[1]	HAPs
Cryo Plant 1 Regen Heater (H-1711)	031	0.47	0.47	0.22	0.01	0.09	0.02
Cryo Plant 2 Regen Heater (H-2711)	037	0.20	0.71	0.34	0.01	0.23	0.03
Cryo Plant 3 Regen Heater (H-3711)	**038**	**0.26**	**0.87**	**0.42**	**0.01**	**0.28**	**0.04**
De-Ethanizer HMO Heater 1 (H-1767)	033	1.93	1.93	0.91	0.03	0.36	0.09
De-Ethanizer HMO Heater 2 (H-1768)	034	1.93	1.93	0.91	0.03	0.36	0.09
De-Ethanizer 2 HMO Heater 1 (H-3767)	**039**	**0.89**	**2.94**	**1.42**	**0.04**	**0.96**	**0.14**
De-Ethanizer 2 HMO Heater 2 (H-3768)	**040**	**0.89**	**2.94**	**1.42**	**0.04**	**0.96**	**0.14**
Stabilization HMO Heater (H-1769)	036	0.48	0.48	0.23	0.01	0.09	0.02
De-Ethanizer Regen Heater (H-1775)	035	0.26	0.26	0.13	0.00	0.05	0.01
Generac SD015	102	0.26	0.14	0.08	0.10	0.02	0.00
Generac SD150	102	1.31	0.55	0.41	0.10	0.04	0.01
Fugitives Emissions	701	--	--	--	--	--	--
Process Flare	C601	1.21	5.53	3.05	0.01	0.11	0.05
*Pigging**	*801*	--	--	--	--	--	--
*Blowdowns**	*601*	--	--	--	--	--	--
*Drain Tank Loadout**	*702*	--	--	--	--	--	--
Regen Dry Seal Vents*	***602***	--	--	--	--	--	--
Rod Packing	601	--	--	0.28	--	--	0.00
Residue Dry Seal Vents	**602**	**--**	**--**	**0.31**	**--**	**--**	**0.00**
Methanol Tanks	--	--	--	0.12	--	--	0.12
Measurement Devices	--	--	--	0.41	--	--	0.01
Future Site-Wide Emissions (lb/hr)		**10.08**	**18.76**	**10.66**	**0.40**	**3.55**	**0.77**

Process/Facility	Source ID	Potential Emissions (tpy)					
		NOx	CO	VOC	SO_2	PM[1]	HAPs
Cryo Plant 1 Regen Heater (H-1711)	031	2.07	2.07	0.98	0.03	0.39	0.10
Cryo Plant 2 Regen Heater (H-2711)	037	0.86	3.13	1.48	0.05	1.02	0.14
Cryo Plant 3 Regen Heater (H-3711)	**038**	**1.14**	**3.79**	**1.83**	**0.06**	**1.24**	**0.18**
De-Ethanizer HMO Heater 1 (H-1767)	033	8.44	8.44	4.01	0.12	1.57	0.39
De-Ethanizer HMO Heater 2 (H-1768)	034	8.44	8.44	4.01	0.12	1.57	0.39
De-Ethanizer 2 HMO Heater 1 (H-3767)	**039**	**3.88**	**12.87**	**6.21**	**0.19**	**4.21**	**0.60**
De-Ethanizer 2 HMO Heater 2 (H-3768)	**040**	**3.88**	**12.87**	**6.21**	**0.19**	**4.21**	**0.60**
Stabilization HMO Heater (H-1769)	036	2.10	2.10	1.00	0.03	0.39	0.10
De-Ethanizer Regen Heater (H-1775)	035	1.16	1.16	0.55	0.02	0.22	0.05
Generac SD015	102	0.07	0.04	0.02	0.03	0.01	0.00
Generac SD150	102	0.33	0.14	0.10	0.03	0.01	0.00
Fugitives Emissions	701	--	--	20.01	--	--	0.64
Process Flare	C601	5.32	24.23	13.34	0.04	0.50	0.23
*Pigging**	*801*	--	--	--	--	--	--
*Blowdowns**	*601*	--	--	--	--	--	--
*Drain Tank Loadout**	*702*	--	--	--	--	--	--
Regen Dry Seal Vents*	***602***	**--**	**--**	**--**	**--**	**--**	**--**
Rod Packing	601	--	--	1.22	--	--	0.01
Residue Dry Seal Vents	**602**	**--**	**--**	**1.34**	**--**	**--**	**0.00**
Methanol Tanks	--	--	--	0.53	--	--	0.53
Measurement Devices	--	--	--	1.81	--	--	0.03
Future Site-Wide Emissions (tpy)		**37.68**	**79.27**	**64.65**	**0.90**	**15.31**	**3.98**

[1] $PM = PM_{10} = PM_{2.5}$

* Emissions are controlled by the flare and thus, are accounted for in the process flare emissions.

Hazardous Air Pollutant Potential Emissions

Process/Facility	Source ID	HAPs - Potential Emissions (lb/hr)								
		Acetaldehyde	Acrolein	Benzene	Ethylbenzene	Formaldehyde	Methanol	n-Hexane	Toluene	Xylenes
Cryo Plant 1 Regen Heater (H-1711)	031	--	--	2.44E-05	--	8.70E-04	--	0.02	3.95E-05	--
Cryo Plant 2 Regen Heater (H-2711)	037	--	--	3.67E-05	--	1.31E-03	--	0.03	5.95E-05	--
Cryo Plant 3 Regen Heater (H-3711)	**038**	**--**	**--**	**4.48E-05**	**--**	**1.60E-03**	**--**	**0.04**	**7.25E-05**	**--**
De-Ethanizer HMO Heater 1 (H-1767)	033	--	--	9.91E-05	--	3.54E-03	--	0.08	1.60E-04	--
De-Ethanizer HMO Heater 2 (H-1768)	034	--	--	9.91E-05	--	3.54E-03	--	0.08	1.60E-04	--
De-Ethanizer 2 HMO Heater 1 (H-3767)	**039**	**--**	**--**	**1.52E-04**	**--**	**5.43E-03**	**--**	**0.13**	**2.46E-04**	**--**
De-Ethanizer 2 HMO Heater 2 (H-3768)	**040**	**--**	**--**	**1.52E-04**	**--**	**5.43E-03**	**--**	**0.13**	**2.46E-04**	**--**
Stabilization HMO Heater (H-1769)	036	--	--	2.47E-05	--	8.82E-04	--	0.02	4.00E-05	--
De-Ethanizer Regen Heater (H-1775)	035	--	--	1.36E-05	--	4.85E-04	--	0.01	2.20E-05	--
Generac SD015	102	2.89E-04	3.48E-05	3.51E-04	--	4.44E-04	--	--	1.54E-04	1.07E-04
Generac SD150	102	1.42E-03	1.72E-04	1.73E-03	--	2.19E-03	--	--	7.59E-04	5.29E-04
Fugitives Emissions	701	--	--	--	--	--	--	--	--	--
Process Flare	C601	--	--	3.83E-03	3.83E-03	--	--	0.02	6.78E-03	1.30E-03
*Pigging**	*801*	--	--	--	--	--	--	--	--	--
*Blowdowns**	*601*	--	--	--	--	--	--	--	--	--
*Drain Tank Loadout**	*702*	--	--	--	--	--	--	--	--	--
Regen Dry Seal Vents*	***602***	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Rod Packing	601	--	--	0.00	0.00	--	--	0.00	0.00	0.00
Residue Dry Seal Vents	**602**	**--**	**--**	**6.04E-04**	**6.04E-04**	**--**	**--**	**0.00**	**0.00**	**0.00**
Methanol Tanks	--	--	--	--	--	--	1.21E-01	--	--	--
Measurement Devices	--	--	--	5.19E-04	5.19E-04	--	--	0.00	9.19E-04	1.76E-04
Future Site-Wide Emissions (lb/hr)		**0.00**	**0.00**	**0.01**	**0.00**	**0.03**	**0.12**	**0.59**	**0.01**	**0.00**

Process/Facility	Source ID	HAPs - Potential Emissions (tpy)								
		Acetaldehyde	Acrolein	Benzene	Ethylbenzene	Formaldehyde	Methanol	n-Hexane	Toluene	Xylenes
Cryo Plant 1 Regen Heater (H-1711)	031	--	--	1.07E-04	--	3.81E-03	--	0.09	1.73E-04	--
Cryo Plant 2 Regen Heater (H-2711)	037	--	--	1.61E-04	--	5.75E-03	--	0.14	2.60E-04	--
Cryo Plant 3 Regen Heater (H-3711)	**038**	**--**	**--**	**1.96E-04**	**--**	**7.00E-03**	**--**	**0.17**	**3.18E-04**	**--**
De-Ethanizer HMO Heater 1 (H-1767)	033	--	--	4.34E-04	--	1.55E-02	--	0.37	7.03E-04	--
De-Ethanizer HMO Heater 2 (H-1768)	034	--	--	4.34E-04	--	1.55E-02	--	0.37	7.03E-04	--
De-Ethanizer 2 HMO Heater 1 (H-3767)	**039**	**--**	**--**	**6.66E-04**	**--**	**2.38E-02**	**--**	**0.57**	**1.08E-03**	**--**
De-Ethanizer 2 HMO Heater 2 (H-3768)	**040**	**--**	**--**	**6.66E-04**	**--**	**2.38E-02**	**--**	**0.57**	**1.08E-03**	**--**
Stabilization HMO Heater (H-1769)	036	--	--	1.08E-04	--	3.86E-03	--	0.09	1.75E-04	--
De-Ethanizer Regen Heater (H-1775)	035	--	--	5.95E-05	--	2.13E-03	--	0.05	9.64E-05	--
Generac SD015	102	7.22E-05	8.70E-06	8.78E-05	--	1.11E-04	--	--	3.85E-05	2.68E-05
Generac SD150	102	3.56E-04	4.29E-05	4.33E-04	--	5.47E-04	--	--	1.90E-04	1.32E-04
Fugitives Emissions	701	--	--	--	--	--	--	--	--	--
Process Flare	C601	--	--	1.68E-02	1.68E-02	--	--	0.11	2.97E-02	5.70E-03
*Pigging**	*801*	--	--	--	--	--	--	--	--	--
*Blowdowns**	*601*	--	--	--	--	--	--	--	--	--
*Drain Tank Loadout**	*702*	--	--	--	--	--	--	--	--	--
Regen Dry Seal Vents*	***602***	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Rod Packing	601	--	--	0.00	0.00	--	--	0.01	0.00	0.00
Residue Dry Seal Vents	**602**	**--**	**--**	**2.65E-03**	**2.65E-03**	**--**	**--**	**0.02**	**0.00**	**0.00**
Methanol Tanks	--	--	--	--	--	--	5.28E-01	--	--	--
Measurement Devices	--	--	--	2.27E-03	2.27E-03	--	--	0.01	4.02E-03	7.73E-04
Future Site-Wide Emissions (tpy)		**0.00**	**0.00**	**0.03**	**0.02**	**0.10**	**0.53**	**2.58**	**0.04**	**0.01**

* Emissions are controlled by the flare and thus, are accounted for in the process flare emissions.

Greenhouse Gas Potential Emissions

Process/Facility	Source ID	GHG (tpy)			
		CO_2	CH_4	N_2O	$CO_2(e)$
Cryo Plant 1 Regen Heater (H-1711)	031	6,850	0.129	0.013	6,857
Cryo Plant 2 Regen Heater (H-2711)	037	10,324	0.195	0.019	10,335
Cryo Plant 3 Regen Heater (H-3711)	**038**	**12,587**	**0.237**	**0.024**	**12,600**
De-Ethanizer HMO Heater 1 (H-1767)	033	27,864	0.526	0.053	27,893
De-Ethanizer HMO Heater 2 (H-1768)	034	27,864	0.526	0.053	27,893
De-Ethanizer 2 HMO Heater 1 (H-3767)	**039**	**42,739**	**0.806**	**0.081**	**42,783**
De-Ethanizer 2 HMO Heater 2 (H-3768)	**040**	**42,739**	**0.806**	**0.081**	**42,783**
Stabilization HMO Heater (H-1769)	036	6,939	0.131	0.013	6,946
De-Ethanizer Regen Heater (H-1775)	035	3,820	0.072	0.007	3,824
Generac SD015	102	15.35	0.001	0.000	15
Generac SD150	102	75.65	0.003	0.001	76
Fugitives Emissions	701	0.64	22.073	-	552
Process Flare	C601	9158	53.562	0.017	10,502
*Pigging**	*801*	-	-	-	--
*Blowdowns**	*601*	-	-	-	--
*Drain Tank Loadout**	*702*	-	-	-	--
Regen Dry Seal Vents*	***602***	**-**	**-**	**-**	**--**
Rod Packing	601	342	107.500	-	3,030
Residue Dry Seal Vents	**602**	**2.86**	**803.548**	**-**	**20,092**
Methanol Tanks	--	-	-	-	--
Measurement Devices	--	0.02	5.822	-	146
Future Site-Wide Emissions (tpy)					**216,325.95**

* Emissions are controlled by the flare and thus, are accounted for in the process flare emissions.

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant

Potential Emissions Increases from HC3 Project

Process/Facility	Source ID	Potential Emissions (tpy)					
		NOx	CO	VOC	SO2	PM_1	HAPs
Cryo Plant 3 Regen Heater (H-3711)	038	1.14	3.79	1.83	0.06	1.24	0.18
De-Ethanizer 2 HMO Heater 1 (H-3767)	039	3.88	12.87	6.21	0.19	4.21	0.60
De-Ethanizer 2 HMO Heater 2 (H-3768)	040	3.88	12.87	6.21	0.19	4.21	0.60
Fugitives Emissions	701	--	--	9.29	--	--	0.14
Process Flare	C601	--	--	--	--	--	--
*Pigging**	*801*	--	--	*0.10*	--	--	*0.01*
*Blowdowns**	*601*	--	--	*1.06*	--	--	*0.01*
*Drain Tank Loadout**	*702*	--	--	*0.28*	--	--	--
*Regen Dry Seal Vents**	--	--	--	*0.70*	--	--	--
Rod Packing	601	--	--	0.04	--	--	0.00
Residue Dry Seal Vents	702	--	--	0.67	--	--	0.00
Methanol Tanks (De Minimis)	--	--	--	0.18	--	--	0.18
Measurement Devices (Exempt)	--	--	--	0.76	--	--	-0.04
Future Site-Wide Emissions (tpy)		**8.91**	**29.54**	**25.19**	**0.44**	**9.65**	**1.64**

1 PM = PM10 = PM2.5

* Emissions are controlled by the flare and thus, are accounted for in the process flare emissions. There are no changes to the PTE for the process flare.

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant

Cryo Plant III Regen Heater Equipped with FGR
H-3711

Source Designation:	
Manufacturer:	Tulsa Heaters
Year Installed	*Planned 2024*
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,153
Rated Duty (mmbtu/hr)	17.34
Maximim Fired Heat Input (HHV) (mmbtu/hr)	21.75
Fuel Consumption (mmscf/hr):	0.0189
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates

Pollutant	**Emission Factor (lb/mmbtu) (lb/MMscf)[a,b]**	**Potential Emissions (lb/hr)[c]**	**(tons/yr)[d]**
NOx	0.012	0.261	1.143
CO	0.0398	0.866	3.792
VOC	0.0192	0.418	1.829
SO_2	0.68	0.0128	0.0560
PM Total	0.013	0.283	1.238
PM Condensable	0.013	0.283	1.238
PM_{10} (Filterable)	0.013	0.283	1.238
$PM_{2.5}$ (Filterable)	0.013	0.283	1.238
CO_2	59.9 kg/mmbtu	2,874	12,587
CH_4	0.001 kg/mmbtu	0.05420	0.237
N_2O	0.0001 kg/mmbtu	0.00542	0.024

Hazardous Air Pollutant (HAP) Potential Emissions

Pollutant	Emission Factor (lb/MMscf)[a]	Potential Emissions	
		(lb/hr)[c]	(tons/yr)[d]
HAPs:			
3-Methylchloranthrene	2.03E-06	3.84E-08	1.68E-07
7,12-Dimethylbenz(a)anthracene	1.81E-05	3.41E-07	1.49E-06
Acenaphthene	2.03E-06	3.84E-08	1.68E-07
Acenaphthylene	2.03E-06	3.84E-08	1.68E-07
Anthracene	2.71E-06	5.12E-08	2.24E-07
Benz(a)anthracene	2.03E-06	3.84E-08	1.68E-07
Benzene	2.37E-03	4.48E-05	1.96E-04
Benzo(a)pyrene	1.36E-06	2.56E-08	1.12E-07
Benzo(b)fluoranthene	2.03E-06	3.84E-08	1.68E-07
Benzo(g,h,i)perylene	1.36E-06	2.56E-08	1.12E-07
Benzo(k)fluoranthene	2.03E-06	3.84E-08	1.68E-07
Chrysene	2.03E-06	3.84E-08	1.68E-07
Dibenzo(a,h) anthracene	1.36E-06	2.56E-08	1.12E-07
Dichlorobenzene	1.36E-03	2.56E-05	1.12E-04
Fluoranthene	3.39E-06	6.40E-08	2.80E-07
Fluorene	3.17E-06	5.97E-08	2.62E-07
Formaldehyde	8.48E-02	1.60E-03	7.00E-03
Hexane	2.03E+00	3.84E-02	1.68E-01
Indo(1,2,3-cd)pyrene	2.03E-06	3.84E-08	1.68E-07
Phenanthrene	1.92E-05	3.63E-07	1.59E-06
Pyrene	5.65E-06	1.07E-07	4.67E-07
Toluene	3.84E-03	7.25E-05	3.18E-04
Arsenic	2.26E-04	4.26E-06	1.87E-05
Beryllium	1.36E-05	2.56E-07	1.12E-06
Cadmium	1.24E-03	2.35E-05	1.03E-04
Chromium	1.58E-03	2.99E-05	1.31E-04
Cobalt	9.50E-05	1.79E-06	7.85E-06
Lead	5.65E-04	1.07E-05	4.67E-05
Manganese	4.30E-04	8.10E-06	3.55E-05
Mercury	2.94E-04	5.54E-06	2.43E-05
Nickel	2.37E-03	4.48E-05	1.96E-04
Selenium	2.71E-05	5.12E-07	2.24E-06
Polycyclic Organic Matter:			
Methylnaphthalene (2-)	2.71E-05	5.12E-07	2.24E-06
Naphthalene	6.90E-04	1.30E-05	5.70E-05
Total HAP	**2.135**	**0.040**	**0.176**

[a] Emission factors from manufacturers guarantees on VOC, NOx, CO, PM in lb/mmbtu. The remainder from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3 (07/98) for all criteria and HAP pollutants, corrected to site-specific gas heat content.

[b] Emission factors for GHG pollutants from 40 CFR Part 98, Subpart C and corrected to site-specific gas heat content.

[c] Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

[d] Annual Emissions $(\text{tons/yr})_{\text{Potential}} = (\text{lb/hr})_{\text{Emissions}} \times$ (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

Owner:	TBD		Owner Ref.:	H-3711
Purchaser:	Exterran		Purchaser Ref.:	OP-125001
Manufacturer:	Tulsa Heaters Midstream		THM Ref.:	P23-0634A
Service:	Regen Gas Heater		Project:	TBD
Number:	1		Location:	TBD
SHO Duty:	17.34	MMBTU/ hr	SHO Model:	SHO1750

Guarantees:

NOx	0.012	Lb/MMBTU	9	ppm
SOx	no quote	Lb/MMBTU	-	ppm
CO	0.0398	Lb/MMBTU	49	ppm
VOC	0.0192	Lb/MMBTU	15	ppm
UHC	0.007	Lb/MMBTU	15	ppm
SPM	0.013	Lb/MMBTU	15	ppm

			Design Case				Maximum Case			
Heat Release	LHV Basis		19.77	MMBTU/hr			21.75	MMBTU/hr		
Products of Combustion		MW								
	O2	32.00	556	Lbm/ hr			611	Lbm/ hr		
	N2 + Ar	28.15	14,010	Lbm/ hr			15,411	Lbm/ hr		
	CO2	44.01	2,521	Lbm/ hr			2,774	Lbm/ hr		
	H2O	18.02	2,175	Lbm/ hr			2,393	Lbm/ hr		
	NOx	46.01	0.24	Lbm/ hr /	9	ppm	0.26	Lbm/ hr /	9	ppm
	SOx	64.06	0.00	Lbm/ hr /	0	ppm	0.00	Lbm/ hr /	0	ppm
	CO	28.01	0.79	Lbm/ hr /	49	ppm	0.87	Lbm/ hr /	49	ppm
	VOC	44.10	0.38	Lbm/ hr /	15	ppm	0.42	Lbm/ hr /	15	ppm
	UHC	16.04	0.14	Lbm/ hr /	15	ppm	0.15	Lbm/ hr /	15	ppm
	SPM		0.26	Lbm/ hr /	15	ppm	0.28	Lbm/ hr /	15	ppm
	Total		19,264	Lbm/ hr			21,191	Lbm/ hr		
Flue Gas Exit Temp.			462	°F						
Flue Gas Exit Velocity			34.5	Ft/sec			38.0	Ft/sec		
Stack Height			25.7	ft			25.7	ft		
Stack ID			28	in			28	in		

NOTE:

THM emissions guarantees applicable between 50-100% of Design Case combustion conditions w/ 15% excess air.

THM emissions guarantees applicable for firebox temperatures above 1100°F.

Emissions above are for Design Case operation with air and fuel in ratio control. Upset conditions, such as operation outside the design, high turndown or start-up are not considered as guaranteed emissions cases.

The Maximum Case is the the specified heat release for the burner purchased. Extra duty is spec'd into the burner to ensure that the burner is never the limiting factor on duty.

revision	date	description	by	chk'd	appv'd
A	30-Jun-23	Initial Design	DCB		

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant

DeEthanizer 2 HMO Heaters Equipped with FGR
H-3767, H-3768

Source Designation:	
Manufacturer:	Tulsa Heaters
Year Installed	*Planned 2024*
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,153
Rated Duty (mmbtu/hr)	62.23
Maximim Fired Heat Input (HHV) (mmbtu/hr)	73.85
Fuel Consumption (mmscf/hr):	6.41E-02
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates

Pollutant	**Emission Factor (lb/mmbtu) (lb/MMscf)[a,b]**	**Potential Emissions (lb/hr)[c]**	**(tons/yr)[d]**
NO_x	0.01	0.886	3.882
CO	0.04	2.939	12.874
VOC	0.019	1.418	6.210
SO_2	0.68	0.0434	0.1903
PM Total	0.013	0.960	4.205
PM Condensable	0.013	0.960	4.205
PM_{10} (Filterable)	0.013	0.960	4.205
$PM_{2.5}$ (Filterable)	0.013	0.960	4.205
CO_2	59.9 kg/mmbtu	9,758	42,739
CH_4	0.001 kg/mmbtu	0.18404	0.806
N_2O	0.0001 kg/mmbtu	0.01840	0.081

Hazardous Air Pollutant (HAP) Potential Emissions

Pollutant	Emission Factor (lb/MMscf)[a]	Potential Emissions	
		(lb/hr)[c]	(tons/yr)[d]
HAPs:			
3-Methylchloranthrene	2.03E-06	1.30E-07	5.71E-07
7,12-Dimethylbenz(a)anthracene	1.81E-05	1.16E-06	5.07E-06
Acenaphthene	2.03E-06	1.30E-07	5.71E-07
Acenaphthylene	2.03E-06	1.30E-07	5.71E-07
Anthracene	2.71E-06	1.74E-07	7.61E-07
Benz(a)anthracene	2.03E-06	1.30E-07	5.71E-07
Benzene	2.37E-03	1.52E-04	6.66E-04
Benzo(a)pyrene	1.36E-06	8.69E-08	3.81E-07
Benzo(b)fluoranthene	2.03E-06	1.30E-07	5.71E-07
Benzo(g,h,i)perylene	1.36E-06	8.69E-08	3.81E-07
Benzo(k)fluoranthene	2.03E-06	1.30E-07	5.71E-07
Chrysene	2.03E-06	1.30E-07	5.71E-07
Dibenzo(a,h) anthracene	1.36E-06	8.69E-08	3.81E-07
Dichlorobenzene	1.36E-03	8.69E-05	3.81E-04
Fluoranthene	3.39E-06	2.17E-07	9.51E-07
Fluorene	3.17E-06	2.03E-07	8.88E-07
Formaldehyde	8.48E-02	5.43E-03	2.38E-02
Hexane	2.03E+00	1.30E-01	5.71E-01
Indo(1,2,3-cd)pyrene	2.03E-06	1.30E-07	5.71E-07
Phenanthrene	1.92E-05	1.23E-06	5.39E-06
Pyrene	5.65E-06	3.62E-07	1.59E-06
Toluene	3.84E-03	2.46E-04	1.08E-03
Arsenic	2.26E-04	1.45E-05	6.34E-05
Beryllium	1.36E-05	8.69E-07	3.81E-06
Cadmium	1.24E-03	7.96E-05	3.49E-04
Chromium	1.58E-03	1.01E-04	4.44E-04
Cobalt	9.50E-05	6.08E-06	2.66E-05
Lead	5.65E-04	3.62E-05	1.59E-04
Manganese	4.30E-04	2.75E-05	1.21E-04
Mercury	2.94E-04	1.88E-05	8.25E-05
Nickel	2.37E-03	1.52E-04	6.66E-04
Selenium	2.71E-05	1.74E-06	7.61E-06
Polycyclic Organic Matter:			
Methylnaphthalene (2-)	2.71E-05	1.74E-06	7.61E-06
Naphthalene	6.90E-04	4.42E-05	1.93E-04
Total HAP		**0.137**	**0.599**

[a] Emission factors from manufacturers guarantees on VOC, NOx, and CO in lb/mmbtu. The remainder from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3 (07/98) for all criteria and HAP pollutants, corrected to site-specific gas heat content.

[b] Emission factors for GHG pollutants from 40 CFR Part 98, Subpart C and corrected to site-specific gas heat content.

[c] Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

[d] Annual Emissions $(\text{tons/yr})_{\text{Potential}} = (\text{lb/hr})_{\text{Emissions}} \times$ (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

Owner:	TBD		Owner Ref.:	H-3768A
Purchaser:	Exterran		Purchaser Ref.:	OP-125001
Manufacturer:	Tulsa Heaters Midstream		THM Ref.:	P23-0634C
Service:	Hot Oil Heater		Project:	TBD
Number:	1		Location:	TBD
SHO Duty:	62.23	MMBTU/ hr	SHO Model:	SHO5000

Guarantees:

NOx	0.012	Lb/MMBTU	9 ppm
SOx	no quote	Lb/MMBTU	- ppm
CO	0.0398	Lb/MMBTU	49 ppm
VOC	0.0192	Lb/MMBTU	15 ppm
UHC	0.007	Lb/MMBTU	15 ppm
SPM	0.013	Lb/MMBTU	15 ppm

			Design Case				Maximum Case			
Heat Release	LHV Basis		73.85	MMBTU/hr			73.85	MMBTU/hr		
Products of Combustion		MW								
	O2	32.00	2,076	Lbm/ hr			2,076	Lbm/ hr		
	N2 + Ar	28.15	52,325	Lbm/ hr			52,325	Lbm/ hr		
	CO2	44.01	9,418	Lbm/ hr			9,418	Lbm/ hr		
	H2O	18.02	8,124	Lbm/ hr			8,124	Lbm/ hr		
	NOx	46.01	0.89	Lbm/ hr /	9	ppm	0.89	Lbm/ hr /	9	ppm
	SOx	64.06	0.00	Lbm/ hr /	0	ppm	0.00	Lbm/ hr /	0	ppm
	CO	28.01	2.94	Lbm/ hr /	49	ppm	2.94	Lbm/ hr /	49	ppm
	VOC	44.10	1.42	Lbm/ hr /	15	ppm	1.42	Lbm/ hr /	15	ppm
	UHC	16.04	0.52	Lbm/ hr /	15	ppm	0.52	Lbm/ hr /	15	ppm
	SPM		0.96	Lbm/ hr /	15	ppm	0.96	Lbm/ hr /	15	ppm
	Total		71,950	Lbm/ hr			71,950	Lbm/ hr		
Flue Gas Exit Temp.			585	°F						
Flue Gas Exit Velocity			49.6	Ft/sec			54.5	Ft/sec		
Stack Height			30.8	ft			30.8	ft		
Stack ID			48	in			48	in		

NOTE:

THM emissions guarantees applicable between 50-100% of Design Case combustion conditions w/ 15% excess air.

THM emissions guarantees applicable for firebox temperatures above 1100°F.

Emissions above are for Design Case operation with air and fuel in ratio control. Upset conditions, such as operation outside the design, high turndown or start-up are not considered as guaranteed emissions cases.

The Maximum Case is the the specified heat release for the burner purchased. Extra duty is spec'd into the burner to ensure that the burner is never the limiting factor on duty.

revision	date	description	by	chk'd	appv'd
A	30-Jun-23	Initial Design	DCB		

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant

Flare

Source Designation:	
Manufacturer:	John Zink
Operating Hours: (hr/yr)	8,760
Pilot + Purge Gas Heat Input (MMBtu/hr)	3.205
Pilot + Purge Gas Annual Fuel Use (mmscf/yr)	26.518
Pilot Fuel Consumption (mmscf/hr):	2.00E-04
Purge Fuel Consumption (mmscf/hr):	2.83E-03
Fuel HHV (Btu/scf)	1,059

Combustion of Hydrocarbons

Source Designation:	
Annual Gas Flow (mmscf/yr)	100.00
Heating value (btu/scf)	1,282.67
Maximum Heat Release of Flare (mmbtu/yr)	128,267

Total Emissions

Pollutant	**Emission Factor (lb/MMBtu)**	**lb/hr**	**tpy**
VOC	--	3.05	13.34
NO_X	0.068	1.21	5.32
CO	0.31	5.53	24.23
SO_2	0.0005	0.01	0.04
PM Total	0.0064	0.11	0.50
PM Condensable	0.0048	0.09	0.37
PM_{10} (Filterable)	0.0016	0.03	0.12
$PM_{2.5}$ (Filterable)	0.0016	0.03	0.12
Hazardous Air Pollutants		**lb/hr**	**tpy**
HAP	--	0.05	0.23
n-Hexane	--	0.02	0.11
Benzene	--	0.00	0.02
Toluene	--	0.01	0.03
Ethylbenzene	--	0.00	0.02
Xylene	--	0.00	0.01
Greenhouse Gases	**Emission Factor (lb/MMBtu)**	**lb/hr**	**tpy**
CO_2	117.05	2090.78	9157.61
CH_4	0.002	12.23	53.56
N_2O	0.0002	0.00	0.02

[a] The NOx and CO emission factors are from AP-42 Section 13.5 "Industrial Flares" Table 13.5-1.

[b] Emission factors for GHG pollutants from 40 CFR Part 98, Subpart C. Tables C-1 and C-2.

[c] The remaining factors are from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1 and 1.4-2.

[d] VOC and HAP emissions are based on mass balance.

[e] The flare calculations assume the composition to the flare is inlet gas.

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant

Pigging Emissions (Controlled by Flare)

Description	Gas Source Basis	Pressure Type	High to Low Pressure Jumper	Control Device	L/R	Size	Max Events/Yr	Pressure (PSIG)[a]	Temp (deg F)	Vessel Volume (acf)	Z Factor[a]	R Factor[b]	MW of Gas[a]	Maximum Volume		Controlled VOC		Controlled HAP	
								Pre-Jump			Pre-Jump			Per Event (scf)	Annually (scf/yr)	Wt%[a]	tpy[c]	Wt%[a]	tpy[c]
Houston Plant HP NGL Launcher	Harmon Creek Plant	HP	N	Flare	Launcher	12	1	1100	85	19.04	0.956	1,545	20.8	1,509.8	1,510	23.9%	0.000	0.41%	0.0000
Mariner West HP Ethane Launcher	Harmon Creek Plant	HP	N	Flare	Launcher	10	1	1100	85	15.95	0.956	1,545	20.8	1,264.8	1,265	23.9%	0.000	0.41%	0.0000
National Fuel Line N HP Residue Launcher	Harmon Creek Plant	HP	N	Flare	Launcher	20	1	1300	85	55.07	0.956	1,545	20.8	5,150.3	5,150	23.9%	0.001	0.41%	0.0000
Rover HP Interconnect Launcher	Harmon Creek Plant	HP	N	Flare	Launcher	24	1	1300	85	108.94	0.758	1,545	20.8	12,852.0	12,852	23.9%	0.002	0.41%	0.0000
Smith CS to Harmon Creek Plant HP Receiver	Harmon Creek Plant	HP	N	Flare	Receiver	20	365	1060	54.2	26.50	0.956	1,545	21.0	2,025.9	739,460	20.2%	0.099	1.67%	0.0082
Proposed HP Receiver	Harmon Creek Plant	HP	N	Flare	Receiver	20	365	1060	54.2	26.50	0.956	1,545	21.0	2,025.9	739,460	20.2%	0.099	1.67%	0.0082
Total															**1,499,696**		**0.201**		**0.016**

* **Pigging emissions are controlled by the flare and emission associated with pigging events are accounted for in the flare emissions section. While potential emissions are included in this section, they are captured under the flaring emissions in the Facility Summary.**

[a] Actual factors for PSIG, Z-factor, MW of gas, VOC wt% of gas and LHV of gas have been calculated but the numbers in the spreadsheet are provided to be very conservative in the event that the composition of the gas field changes over time.

[b] R Factor = (psfa*ft3* lbmol/(lb*R))

[c] Per the Consent Decree filed in April 2018, the mass of VOC emissions from pigging operations are multiplied by a factor of: 1.2

CO_2 wt%	0.21%	
CH_4 wt%	77.0%	
CO_2 emissions	**0.002**	**tpy**
CH_4 emissions	**0.65**	**tpy**

MarkWest Liberty Midstream & Resources, L.L.C.

Harmon Creek Gas Plant

Estimated Potential Blowdowns (Controlled by Flare)

Compressor	Description	Rated HP[a]	Blowdown frequency per year	Operating pressure (PSIG)	Volume Gas or Liquid (ft^3)	Product	Z-factor	MW	Volume Routed to Flare (scf)	Mass Routed to Flare (lb)	VOC Wt%	VOC Emissions (lbs)	HAP wt%	HAP Emissions (lbs)	Methane wt%	Methane Emissions (lbs)	CO2 wt%	CO2 Emissions (lbs)
C-1111	Regen Centrifugal	150	6	1,100.00	20	Inlet	0.71	21.17	730	41	23.886%	9.724	0.409%	0.166	77.010%	31.352	0.212%	0.086
C-2111	Regen Centrifugal	150	6	1,100.00	20	Inlet	0.71	21.17	730	41	23.886%	9.724	0.409%	0.166	77.010%	31.352	0.212%	0.086
C-1121	Centrifugal w/ no drive	19700	6	400.00	2681	Residue	0.95	17.04	21446	928	0.109%	1.013	0.000%	0.000	95.123%	883.156	0.528%	4.900
C-2121	Centrifugal w/ no drive	19700	6	400.00	2681	Residue	0.95	17.04	21446	928	0.109%	1.013	0.000%	0.000	95.123%	0.000	0.528%	0.000
C-1151	Recip	5000	6	385.00	125.5	Residue	0.95	17.04	968	42	0.109%	0.046	0.000%	0.000	95.123%	39.848	0.528%	0.221
			6	705.00	162.3	Residue	0.91	17.04	2352	102	0.109%	0.111	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	1,210.00	60.8	Residue	0.86	17.04	1587	69	0.109%	0.075	0.000%	0.000	95.123%	96.868	0.528%	0.537
C-1152	Recip	5000	6	385.00	125.5	Residue	0.95	17.04	968	42	0.109%	0.046	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	705.00	162.3	Residue	0.91	17.04	2352	102	0.109%	0.111	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	1,210.00	60.8	Residue	0.86	17.04	1587	69	0.109%	0.075	0.000%	0.000	95.123%	96.868	0.528%	0.537
C-1153	Recip	5000	6	385.00	125.5	Residue	0.95	17.04	968	42	0.109%	0.046	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	705.00	162.3	Residue	0.91	17.04	2352	102	0.109%	0.111	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	1,210.00	60.8	Residue	0.86	17.04	1587	69	0.109%	0.075	0.000%	0.000	95.123%	96.868	0.528%	0.537
C-1154	Recip	5000	6	385.00	125.5	Residue	0.95	17.04	968	42	0.109%	0.046	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	705.00	162.3	Residue	0.91	17.04	2352	102	0.109%	0.111	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	1,210.00	60.8	Residue	0.86	17.04	1587	69	0.109%	0.075	0.000%	0.000	95.123%	96.868	0.528%	0.537
C-2151	Recip	5000	6	385.00	125.5	Residue	0.95	17.04	968	42	0.109%	0.046	0.000%	0.000	95.123%	39.848	0.528%	0.221
			6	705.00	162.3	Residue	0.91	17.04	2352	102	0.109%	0.111	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	1,210.00	60.8	Residue	0.86	17.04	1587	69	0.109%	0.075	0.000%	0.000	95.123%	96.868	0.528%	0.537
C-2152	Recip	5000	6	385.00	125.5	Residue	0.95	17.04	968	42	0.109%	0.046	0.000%	0.000	95.123%	39.848	0.528%	0.221
			6	705.00	162.3	Residue	0.91	17.04	2352	102	0.109%	0.111	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	1,210.00	60.8	Residue	0.86	17.04	1587	69	0.109%	0.075	0.000%	0.000	95.123%	96.868	0.528%	0.537
C-2153	Recip	5000	6	385.00	125.5	Residue	0.95	17.04	968	42	0.109%	0.046	0.000%	0.000	95.123%	39.848	0.528%	0.221
			6	705.00	162.3	Residue	0.91	17.04	2352	102	0.109%	0.111	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	1,210.00	60.8	Residue	0.86	17.04	1587	69	0.109%	0.075	0.000%	0.000	95.123%	96.868	0.528%	0.537
C-1179	Centirfugal	100	6	495.00	14	Ethane	0.57	30.07	394	30	0.001%	0.000	0.001%	0.000	0.000%	0.000	0.001%	0.000
C-1140	Screw	1500	6	297.00	204	Propane	0.84	16.04	1307	149	100.000%	148.971	0.001%	0.001	0.000%	0.000	0.000%	0.000
C-1141	Screw	1500	6	297.00	204	Propane	0.84	16.04	1307	149	100.000%	148.971	0.001%	0.001	0.000%	0.000	0.000%	0.000
C-1142	Screw	1500	6	297.00	204	Propane	0.84	16.04	1307	149	100.000%	148.971	0.001%	0.001	0.000%	0.000	0.000%	0.000
C-1155	Screw	1500	6	297.00	204	Propane	0.84	16.04	1307	149	100.000%	148.971	0.001%	0.001	0.000%	0.000	0.000%	0.000
C-1156	Screw	1500	6	297.00	204	Propane	0.84	16.04	1307	149	100.000%	148.971	0.001%	0.001	0.000%	0.000	0.000%	0.000
C-1157	Screw	1500	6	297.00	204	Propane	0.84	16.04	1307	149	100.000%	148.971	0.001%	0.001	0.000%	0.000	0.000%	0.000
C-2141	Screw	1500	6	297.00	204	Propane	0.84	16.04	1307	149	100.000%	148.971	0.001%	0.001	0.000%	0.000	0.000%	0.000
C-2142	Screw	1500	6	297.00	204	Propane	0.84	16.04	1307	149	100.000%	148.971	0.001%	0.001	0.000%	0.000	0.000%	0.000
C-2143	Screw	1500	6	297.00	204	Propane	0.84	16.04	1307	149	100.000%	148.971	0.001%	0.001	0.000%	0.000	0.000%	0.000
C-1191	Recip	900	6	285.00	122	Inlet	0.71	21.17	1177	66	23.886%	15.687	0.409%	0.268	77.010%	50.577	0.212%	0.139
			6	1,117.00	122	Inlet	0.71	21.17	4428	247	23.886%	59.006	0.409%	0.268	77.010%	50.577	0.212%	0.139
C-1192	Recip	900	6	285.00	122	Inlet	0.71	21.17	1173	65	23.886%	15.626	0.409%	0.268	77.010%	50.577	0.212%	0.139
			6	1,117.00	122	Inlet	0.71	21.17	4428	247	23.886%	59.006	0.409%	0.268	77.010%	50.577	0.212%	0.139
TBD	Screw	75	6	25.00	10	CO2	0.94	43.57	20	2	0.001%	0.000	0.001%	0.000	0.000%	0.000	100.00%	2.319
			6	40.00	10	CO2	0.94	43.57	27	3	0.001%	0.000	0.001%	0.000	0.000%	0.000	100.00%	2.319
			6	210.00	10	CO2	0.94	43.57	112	13	0.001%	0.000	0.001%	0.000	0.000%	0.000	100.00%	2.319
			6	420.00	10	CO2	0.94	43.57	217	25	0.001%	0.000	0.001%	0.000	0.000%	0.000	100.00%	2.319
TBD	Recip	75	6	25.00	10	CO2	0.94	43.57	20	2	0.001%	0.000	0.001%	0.000	0.000%	0.000	100.00%	2.319
			6	40.00	10	CO2	0.94	43.57	27	3	0.001%	0.000	0.001%	0.000	0.000%	0.000	100.00%	2.319
			6	210.00	10	CO2	0.94	43.57	112	13	0.001%	0.000	0.001%	0.000	0.000%	0.000	100.00%	2.319
			6	420.00	10	CO2	0.94	43.57	217	25	0.001%	0.000	0.001%	0.000	0.000%	0.000	100.00%	2.319
TBD	Centrifugal	150	6	1,100.00	20	Regen/Inlet	0.71	21.17	730	41	23.886%	9.724	0.409%	0.166	77.010%	31.352	0.212%	0.086
TBD	Centirfugal	100	6	495.00	14	Ethane	0.57	30.07	394	30	0.001%	0.000	0.001%	0.000	0.000%	0.000	0.001%	0.000
TBD	Screw	2250	6	297.00	306	Propane	0.84	16.04	1960	223	100.000%	223.457	0.001%	0.001	0.000%	0.000	0.000%	0.000
TBD	Screw	2250	6	297.00	306	Propane	0.84	16.04	1960	223	100.000%	223.457	0.001%	0.001	0.000%	0.000	0.000%	0.000
TBD	Screw	2250	6	297.00	306	Propane	0.84	16.04	1960	223	100.000%	223.457	0.001%	0.001	0.000%	0.000	0.000%	0.000
TBD	Screw	3500	6	297.00	476	Propane	0.84	16.04	3049	348	100.000%	347.600	0.001%	0.001	0.000%	0.000	0.000%	0.000
TBD	Screw	3500	6	297.00	476	Propane	0.84	16.04	3049	348	100.000%	347.600	0.001%	0.001	0.000%	0.000	0.000%	0.000
TBD	Screw	3500	6	297.00	476	Propane	0.84	16.04	3049	348	100.000%	347.600	0.001%	0.001	0.000%	0.000	0.000%	0.000
TBD	Centrifugal	20000	6	385.00	125.5	Residue	0.95	17.04	968	42	0.109%	0.046	0.000%	0.000	95.123%	39.848	0.528%	0.221
			6	705.00	162.3	Residue	0.91	17.04	2352	102	0.109%	0.111	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	1,210.00	60.8	Residue	0.86	17.04	1587	69	0.109%	0.075	0.000%	0.000	95.123%	96.868	0.528%	0.537
TBD	Centrifugal	20000	6	385.00	125.5	Residue	0.95	17.04	968	42	0.109%	0.046	0.000%	0.000	95.123%	39.848	0.528%	0.221
			6	705.00	162.3	Residue	0.91	17.04	2352	102	0.109%	0.111	0.000%	0.000	95.123%	96.868	0.528%	0.537
			6	1,210.00	60.8	Residue	0.86	17.04	1587	69	0.109%	0.075	0.000%	0.000	95.123%	96.868	0.528%	0.537
--	Misc. Maintenance Activities	--	64	1,200.00	500	Inlet	0.71	21.17	207761	11591	23.886%	2768.661	0.409%	47.387	77.010%	8926.448	0.212%	24.560
--	Plant Shutdown	--	1	--	--	Inlet	0.71	21.17	11520480	642744	23.886%	153523.978	0.409%	2627.624	77.010%	494977.093	0.212%	1361.841
								Total Volume to Flare	23,714,032		Total (lbs)	319058.32		2676.607		507356.376		1423.280
										Potential	Controlled (lbs)	6381.17		53.53		10147.13		28.47
											Controlled (tpy)	3.19		0.03		5.07		0.01

[a] Maintenance blowdown frequencies and volumes listed are estimates and may vary. Maintenance blowdown emissions are controlled by the flare and accounted for in the flare emissions section.

[b] Volumes of compressors based on engineering estimates or calculated using CATG3612 at 483.1 acf and scaled to horsepower from 3550.

[c] Miscellaneous maintenance activities, such as filter change outs, are included for conservatism.

[d] The plant shutdown volume is based on estimates from actual flare meter data and a conservative factor of 3 is applied to the volume to account for HC2 and HC3.

[e] A factor of 2.0 is applied to the total blowdown volume to flare for conservatism.

Calculation Methodology

Emissions (lbs) = ((Operating P (PSIG) + Standard P (14.7 PSIG)) x Volume x MW) / (R (1545 ft lb/lb-mol R) x Standard Temp (60 F) x Z-Factor) x Pollutant wt% x # Events x Control Efficiency (1-98%)

MarkWest Liberty Midstream and Resources, L.L.C.
Harmon Creek Gas Plant

Condensate Truck Loadout Emissions

Source	Volume Loaded (gal/yr)	Saturation Factor[1]	Vapor Pressure[2] (psia)	Vapor Molecular Weight[2] (lb/lb-mol)	Liquid Temp[3] (^{o}F)	Liquid Temp (^{o}R)	Loading Loss[4] (lb VOC/1000 gal)	Loading Loss (lb/yr)	Loading Loss (tpy)
Harmon Creek Closed Drain Tank	300,000	0.6	8.1621	60	58.5	518.2	7.1	2,119.69	1.06

[1] From AP-42 Table 5.2-1, for tank trucks in submerged loading: dedicated normal service

[2] From AP42 Table 7.1-2, Gasoline (RVP 15), 60 deg

[3] Daily average liquid surface temperature (TANKS 4.09d)

[4] Loading Loss (lb VOC/1000 gal) = (12.46*S*P*M)/T [AP42 Section 5.2 (1/95)]

[5] Loading losses are controlled by the flare. Thus, emissions associated with the Condensate Truck Loadout Emissions are captured under the Flare Emission estimates.

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant

Fugitive Emissions

Component Type	Stream Type (Gas Vapor, Light Liquid, Heavy Liquid)	Gas Type	From LeakDAS	Number of Components[a]	AP-42 Leak Emission Factors kg/hr/component[b]	Reduction Factors[c]	Final Leak Factor lb/hr/component	Weight Percent[e]				Total	Potential VOC Emissions		Potential HAP Emissions		Potential CH4 Emissions		Potential CO2 Emissions	
								VOC	HAP	CH4	CO2	Emissions (tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Compressor	GV	INLET	7	21	8.80E-03	80%	3.88E-03	23.9%	0.4%	77.0%	0.2%	0.357	0.02	0.09	0.00	0.00	0.06	0.28	0.00	0.00
Compressor	GV	RESIDUE	12	36	8.80E-03	0%	1.94E-02	0.1%	0.0%	87.5%	0.3%	3.061	0.00	0.00	0.00	0.00	0.61	2.68	0.00	0.01
Compressor	GV	ETHAN	3	9	8.80E-03	0%	1.94E-02	0.5%	0.1%	0.0%	0.0%	0.765	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Compressor	GV	CO2	2	6	8.80E-03	0%	1.94E-02	0.5%	0.1%	0.0%	100.0%	0.510	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.51
Compressor	GV	PROPANE	11	33	8.80E-03	80%	3.88E-03	100.0%	0.0%	0.0%	0.0%	0.561	0.13	0.56	0.00	0.00	0.00	0.00	0.00	0.00
Compressor	LL	INLET	4	12	7.50E-03	80%	3.31E-03	23.9%	0.4%	77.0%	0.2%	0.174	0.01	0.04	0.00	0.00	0.03	0.13	0.00	0.00
Connector	GV	INLET GAS	19	57	2.00E-04	75%	1.10E-04	23.9%	0.4%	77.0%	0.2%	0.028	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00
Connector	GV	C3+	424	1272	2.00E-04	75%	1.10E-04	100.0%	0.0%	0.0%	0.0%	0.615	0.14	0.61	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	REFRIG C3	42	126	2.00E-04	75%	1.10E-04	100.0%	0.0%	0.0%	0.0%	0.061	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	REGEN De-Eth	10	30	2.00E-04	75%	1.10E-04	0.5%	0.1%	0.0%	0.0%	0.014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	FLARE GAS	1254	3762	2.00E-04	75%	1.10E-04	23.9%	0.4%	77.0%	0.2%	1.817	0.10	0.43	0.00	0.01	0.32	1.40	0.00	0.00
Connector	GV	C3+	1	3	2.00E-04	75%	1.10E-04	100.0%	0.0%	0.0%	0.0%	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	INLET	69	207	2.00E-04	75%	1.10E-04	23.9%	0.4%	77.0%	0.2%	0.100	0.01	0.02	0.00	0.00	0.02	0.08	0.00	0.00
Connector	GV	REGEN GAS De-Eth	13	39	2.00E-04	75%	1.10E-04	0.5%	0.1%	0.0%	0.0%	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	C2+	112	336	2.00E-04	75%	1.10E-04	51.4%	5.3%	0.1%	0.1%	0.162	0.02	0.08	0.00	0.01	0.00	0.00	0.00	0.00
Connector	GV	INLET	252	756	2.00E-04	75%	1.10E-04	23.9%	0.4%	77.0%	0.2%	0.365	0.02	0.09	0.00	0.00	0.06	0.28	0.00	0.00
Connector	GV	REGEN De-Eth	1	3	2.00E-04	75%	1.10E-04	0.5%	0.1%	0.0%	0.0%	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	C3+	3	9	2.00E-04	75%	1.10E-04	100.0%	0.0%	0.0%	0.0%	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	FLARE GAS	1	3	2.10E-04	75%	1.16E-04	23.9%	0.4%	77.0%	0.2%	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	METHANOL	102	306	2.10E-04	75%	1.16E-04	100.0%	100.0%	0.0%	0.0%	0.155	0.04	0.16	0.04	0.16	0.00	0.00	0.00	0.00
Connector	LL	REGEN GAS De-Eth	108	324	2.10E-04	75%	1.16E-04	0.5%	0.1%	0.0%	0.0%	0.164	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	ETHAN	47	141	2.10E-04	75%	1.16E-04	0.5%	0.1%	0.0%	0.0%	0.072	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	ETHAN	20	60	2.10E-04	75%	1.16E-04	0.5%	0.1%	0.0%	0.0%	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	C3+	857	2571	2.10E-04	75%	1.16E-04	100.0%	0.0%	0.0%	0.0%	1.304	0.30	1.30	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	METHANOL	25	75	2.10E-04	75%	1.16E-04	100.0%	100.0%	0.0%	0.0%	0.038	0.01	0.04	0.01	0.04	0.00	0.00	0.00	0.00
Connector	LL	INLET GAS	238	714	2.10E-04	75%	1.16E-04	23.9%	0.4%	77.0%	0.2%	0.362	0.02	0.09	0.00	0.00	0.06	0.28	0.00	0.00
Connector	LL	C3+	310	930	2.10E-04	75%	1.16E-04	100.0%	0.0%	0.0%	0.0%	0.472	0.11	0.47	0.00	0.00	0.00	0.00	0.00	0.00
Connector	LL	INLET GAS	100	300	2.10E-04	75%	1.16E-04	23.9%	0.4%	77.0%	0.2%	0.152	0.01	0.04	0.00	0.00	0.03	0.12	0.00	0.00
Pressure Relief	GV	REGEN De-Eth	28	84	8.80E-03	97%	5.82E-04	0.5%	0.1%	0.0%	0.0%	0.214	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pressure Relief	GV	FLARE	467	1401	8.80E-03	97%	5.82E-04	23.9%	0.4%	77.0%	0.2%	3.574	0.19	0.85	0.00	0.01	0.63	2.75	0.00	0.01
Pressure Relief	GV	FLARE GAS	344	1032	8.80E-03	97%	5.82E-04	23.9%	0.4%	77.0%	0.2%	2.632	0.14	0.63	0.00	0.01	0.46	2.03	0.00	0.01
Pressure Relief	LL	C3	148	444	7.50E-03	97%	4.96E-04	100.0%	0.0%	0.0%	0.0%	0.965	0.22	0.97	0.00	0.00	0.00	0.00	0.00	0.00
Pressure Relief	LL	C2+	782	2346	7.50E-03	97%	4.96E-04	51.4%	5.3%	0.1%	0.1%	5.100	0.60	2.62	0.06	0.27	0.00	0.00	0.00	0.01
Pressure Relief	LL	REGEN GAS De-Eth	337	1011	7.50E-03	97%	4.96E-04	0.5%	0.1%	0.0%	0.0%	2.198	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Pressure Relief	LL	FLARE	79	237	7.50E-03	97%	4.96E-04	23.9%	0.4%	77.0%	0.2%	0.515	0.03	0.12	0.00	0.00	0.09	0.40	0.00	0.00
Pressure Relief	LL	C3+	4	12	7.50E-03	97%	4.96E-04	100.0%	0.0%	0.0%	0.0%	0.026	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Pressure Relief	LL	REGEN GAS	26	78	7.50E-03	97%	4.96E-04	23.9%	0.4%	77.0%	0.2%	0.170	0.01	0.04	0.00	0.00	0.03	0.13	0.00	0.00
Pressure Relief	LL	REGEN GAS	80	240	7.50E-03	97%	4.96E-04	23.9%	0.4%	77.0%	0.2%	0.522	0.03	0.12	0.00	0.00	0.09	0.40	0.00	0.00
Pressure Relief	LL	C3	403	1209	7.50E-03	97%	4.96E-04	100.0%	0.0%	0.0%	0.0%	2.628	0.60	2.63	0.00	0.00	0.00	0.00	0.00	0.00
Pump	GV	FLARE	5	15	2.40E-03	0%	5.29E-03	23.9%	0.4%	77.0%	0.2%	0.348	0.02	0.08	0.00	0.00	0.06	0.27	0.00	0.00
Pump	GV	FLARE	129	387	2.40E-03	0%	5.29E-03	23.9%	0.4%	77.0%	0.2%	8.974	0.49	2.14	0.01	0.04	1.58	6.91	0.00	0.02
Pump	LL	C2+	6	18	1.30E-02	85%	4.30E-03	51.4%	5.3%	0.1%	0.1%	0.339	0.04	0.17	0.00	0.02	0.00	0.00	0.00	0.00

MarkWest Liberty Midstream & Resources, L.L.C.

Harmon Creek Gas Plant

Fugitive Emissions

Component Type	Stream Type (Gas Vapor, Light Liquid, Heavy Liquid)	Gas Type	From LeakDAS	Number of Components[a]	AP-42 Leak Emission Factors kg/hr/component[b]	Reduction Factors[c]	Final Leak Factor lb/hr/component	Weight Percent[e]				Total	Potential VOC Emissions		Potential HAP Emissions		Potential CH4 Emissions		Potential CO2 Emissions	
								VOC	HAP	CH4	CO2	Emissions (tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Valve	GV	REGEN GAS De-Eth	63	189	4.50E-03	97%	2.98E-04	0.5%	0.1%	0.0%	0.0%	0.247	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Valve	GV	C2+	44	132	4.50E-03	97%	2.98E-04	51.4%	5.3%	0.1%	0.1%	0.172	0.02	0.09	0.00	0.01	0.00	0.00	0.00	0.00
Valve	GV	C3	3	9	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	0.012	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Valve	GV	INLET GAS	44	132	4.50E-03	97%	2.98E-04	23.9%	0.4%	77.0%	0.2%	0.172	0.01	0.04	0.00	0.00	0.03	0.13	0.00	0.00
Valve	GV	C3+	113	339	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	0.442	0.10	0.44	0.00	0.00	0.00	0.00	0.00	0.00
Valve	GV	C3	489	1467	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	1.914	0.44	1.91	0.00	0.00	0.00	0.00	0.00	0.00
Valve	GV	REFRIG C3	154	462	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	0.603	0.14	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Valve	GV	INLET	12	36	4.50E-03	97%	2.98E-04	23.9%	0.4%	77.0%	0.2%	0.047	0.00	0.01	0.00	0.00	0.01	0.04	0.00	0.00
Valve	GV	REFRIG C3	2	6	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	0.008	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Valve	GV	C3	140	420	4.50E-03	97%	2.98E-04	100.0%	0.0%	0.0%	0.0%	0.548	0.13	0.55	0.00	0.00	0.00	0.00	0.00	0.00
Valve	LL	C2+	290	870	2.50E-03	97%	1.65E-04	51.4%	5.3%	0.1%	0.1%	0.630	0.07	0.32	0.01	0.03	0.00	0.00	0.00	0.00
Valve	LL	INLET	935	2805	2.50E-03	97%	1.65E-04	23.9%	0.4%	77.0%	0.2%	2.033	0.11	0.49	0.00	0.01	0.36	1.57	0.00	0.00
Valve	LL	REGEN GAS	2	6	2.50E-03	97%	1.65E-04	23.9%	0.4%	77.0%	0.2%	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Valve	LL	METHANOL	2	6	2.50E-03	97%	1.65E-04	100.0%	100.0%	0.0%	0.0%	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Valve	LL	INLET	390	1170	2.50E-03	97%	1.65E-04	23.9%	0.4%	77.0%	0.2%	0.848	0.05	0.20	0.00	0.00	0.15	0.65	0.00	0.00
Valve	LL	C3+	2	6	2.50E-03	97%	1.65E-04	100.0%	0.0%	0.0%	0.0%	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Valve	LL	METHANOL	1	3	2.50E-03	97%	1.65E-04	100.0%	100.0%	0.0%	0.0%	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Valve	LL	REFRIG C3	181	543	2.50E-03	97%	1.65E-04	100.0%	0.0%	0.0%	0.0%	0.393	0.09	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Valve	LL	REFRIG C3	92	276	2.50E-03	97%	1.65E-04	100.0%	0.0%	0.0%	0.0%	0.200	0.05	0.20	0.00	0.00	0.00	0.00	0.00	0.00
Valve	LL	FLARE	19	57	2.50E-03	97%	1.65E-04	23.9%	0.4%	77.0%	0.2%	0.041	0.00	0.01	0.00	0.00	0.01	0.03	0.00	0.00
Valve	LL	FLARE	3	9	2.50E-03	97%	1.65E-04	23.9%	0.4%	77.0%	0.2%	0.007	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Connector	HL	HMO		1708	7.50E-06	0%	1.65E-05	100.0%	0.0%	0.0%	0.0%	0.124	0.03	0.12	0.00	0.00	0.00	0.00	0.00	0.00
Valve	HL	HMO		569	8.40E-06	0%	1.85E-05	100.0%	0.0%	0.0%	0.0%	0.046	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Pressure Relief	HL	HMO		16	3.20E-05	0%	7.06E-05	100.0%	0.0%	0.0%	0.0%	0.005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	HL	CO2		569	7.50E-06	0%	1.65E-05	0.5%	0.1%	0.0%	100.0%	0.041	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04
Valve	HL	CO2		190	8.40E-06	0%	1.85E-05	0.5%	0.1%	0.0%	100.0%	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Pressure Relief	HL	CO2		5	3.20E-05	0%	7.06E-05	0.5%	0.1%	0.0%	100.0%	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Connector	GV	Residue		1900	2.00E-04	75%	1.10E-04	0.1%	0.0%	87.5%	0.3%	0.918	0.00	0.00	0.00	0.00	0.18	0.80	0.00	0.00
Valve	GV	Residue		600	4.50E-03	97%	2.98E-04	0.1%	0.0%	87.5%	0.3%	0.783	0.00	0.00	0.00	0.00	0.16	0.69	0.00	0.00
				35,155								Total	4.57	20.01	0.15	0.64	5.04	22.07	0.15	0.64

Notes:

[a] Component counts are based on a combination of counts from LeakDas and PIDs and estimates based on studies at similar facilities.

[b] Table 2-4. Oil & Gas Production Operations Average Emission Factors, Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, November 1995. Emission factors based on average measured TOC from component types indicated in gas or light oil service at O&G Production Operations.

[c] Table V: Control Efficiencies for LDAR for 28VHP programs, Air Permit Technical Guidance for Chemical Sources Fugitive Guidance, TCEQ (APDG 6422v2, Revised 06/2018). Compressors are monitored quarterly via OGI.

[d] Table 5-1. Summary of Equipment Modifications, Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, November 1995.

[e] CO2 and C2 service are estimated at 0.5 VOC wt% to be conservative.

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant
Rod Packing Emissions

Reciprocating Compressors
Rod Packing Venting

Total Rod Packing Emissions

Pollutant	Emissions	
	lb/hr	tpy
VOC	0.28	1.22
Methane	24.54	107.50
Carbon Dioxide	78.14	342.26
n-Hexane	0.00	0.01
Benzene	0.00	0.00
Toluene	0.00	0.00
Ethylbenzene	0.00	0.00
Xylene	0.00	0.00
Total HAPs	0.00	0.01

Proposed CO2 Compressors

Emission Rate[a]	480.0	(scf/hr)
MW	0.115	(lb/scf)
Number of Compressors	1	
Total Emissions	55.108	(lb/hr)

[a]Based on max allowable under NSPS OOOOb

Pollutant	Mass %	Emissions	
		lb/hr	tpy
VOC	0.02%	0.009	0.040
Methane	0.01%	0.005	0.022
Carbon Dioxide	97.82%	53.907	236.115
n-Hexane	0.00%	0.000	0.000
Benzene	0.00%	0.000	0.000
Toluene	0.00%	0.000	0.000
Ethylbenzene	0.00%	0.000	0.000
Xylene	0.00%	0.000	0.000
Total HAPs	0.00%	0.000	0.000

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant
Dry Seal Vent Emissions

Centrifugal Compressor Dry Seal Vents

Total Dry Seal Vent Emissions

Pollutant	Uncontrolled Emissions	
	lb/hr	tpy
VOC	0.79	3.44
Methane	183.46	803.55
Carbon Dioxide	0.65	2.86
n-Hexane	0.00	0.02
Benzene	0.00	0.00
Toluene	0.00	0.00
Ethylbenzene	0.00	0.00
Xylene	0.00	0.00
Total HAPs	0.01	0.04

Proposed Residue Compressors

Emission Rate[a]	600.0	(scf/hr)
Density	0.043	(lb/scf)
Seals per Compressor	2	
Number of Compressors	2	
Total Emissions	103.90	(lb/hr)

[a]Based on max allowable level under NSPS OOOOb

Pollutant	Mass %	Emissions	
		lb/hr	tpy
VOC	0.15%	0.153	0.671
Methane	87.54%	90.956	398.386
Carbon Dioxide	0.31%	0.324	1.420
n-Hexane	0.00%	0.000	0.000
Benzene	0.00%	0.000	0.000
Toluene	0.00%	0.000	0.000
Ethylbenzene	0.00%	0.000	0.000
Xylene	0.00%	0.000	0.000
Total HAPs	0.00%	0.000	0.000

Proposed Regen Centrifugal Compressors

Emission Rate[a]	600.0	(scf/hr)
Density	0.056	(lb/scf)
Number of Compressors	1	
Seals per Compressor	1	
Total Emissions	33.475	(lb/hr)
Recovery Rate	98%	
Total Emissions	0.669	(lb/hr)

[a]Based on max allowable level under NSPS OOOOb

Pollutant	Mass %	Emissions	
		lb/hr	tpy
VOC	23.89%	0.160	0.700
Methane	77.01%	0.516	2.258
Carbon Dioxide	0.21%	0.001	0.006
n-Hexane	0.19%	0.001	0.006
Benzene	0.03%	0.000	0.001
Toluene	0.05%	0.000	0.002
Ethylbenzene	0.03%	0.000	0.001
Xylene	0.01%	0.000	0.000
Total HAPs	0.41%	0.003	0.012

Existing Residue Centrifugal Compressors

Emission Rate[a]	600.0	(scf/hr)
Density	0.043	(lb/scf)
Number of Compressors	2	
Seals per Compressor	2	
Total Emissions	103.899	(lb/hr)

[a]Based on max allowable level under NSPS OOOOb

Pollutant	Mass %	Emissions	
		lb/hr	tpy
VOC	0.15%	0.153	0.671
Methane	87.54%	90.956	398.386
Carbon Dioxide	0.31%	0.324	1.420
n-Hexane	0.00%	0.000	0.000
Benzene	0.00%	0.000	0.000
Toluene	0.00%	0.000	0.000
Ethylbenzene	0.00%	0.000	0.000
Xylene	0.00%	0.000	0.000
Total HAPs	0.00%	0.000	0.000

Existing Regen Centrifugal Compressors

Emission Rate[a]	600.0	(scf/hr)
Density	0.056	(lb/scf)
Number of Compressors	2	
Seals per Compressor	1	
Uncontrolled Emissions	66.950	
Destruction Efficiency	98%	
Controlled Emissions	1.339	(lb/hr)

[a]Based on max allowable level under NSPS OOOOb and controlled by the process flare.

Pollutant	Mass %	Emissions	
		lb/hr	tpy
VOC	23.89%	0.320	1.401
Methane	77.01%	1.031	4.516
Carbon Dioxide	0.21%	0.003	0.012
n-Hexane	0.19%	0.003	0.011
Benzene	0.03%	0.000	0.002
Toluene	0.05%	0.001	0.003
Ethylbenzene	0.03%	0.000	0.002
Xylene	0.01%	0.000	0.001
Total HAPs	0.41%	0.005	0.024

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant

Methanol Emission Estimates

Source Information:	
Contents:	Methanol
Quantity:	3
Tank Orientation/Geometry:	Horizontal Cylinder
Approx. Height (ft):	5.0
Approx. Diameter (ft):	4.2
Volume (gal):	500
Turnovers per year:	0.10
Maximum Fill Level:	90%
Insulation:	None
Tank Color:	Red
Control Percentage:	0
Site-Wide Throughput (gal/yr)	150
Site-Wide Throughput (bbl/day)	0.010

Total Methanol Emissions (Sum of Tank Emissions + Process Emissions below):

Pollutant	**Conservative Losses**	
	lb/hr	**tpy**
Total VOC	**0.121**	**0.528**
Total HAP	**0.121**	**0.528**

Tank Emissions:

Pollutant	Tank Losses	
	lb/hr	tpy
Total VOC	0.005	0.020
Total HAP	0.005	0.020

Methanol tank losses are conservatively based on 50 gallons of use annually and modeled using ProMax 5.0. Please note, MarkWest uses no more than five (5) gallons of methanol per year.

Process Emissions:

Pollutant	Conservative Losses	
	lb/hr	tpy
Total VOC	0.116	0.508
Total HAP	0.116	0.508

Methanol losses from the process conservatively assumes all methanol injected into the system is emitted to the atmosphere, however, only a portion of the injected methanol will be emitted. Additionally, MarkWest uses no more than five (5) gallons of methanol per year, however, emission estimates are based on 10 times that quantity.
Sample Calculation:
Methanol emissions (tpy) = Methanol usage (gal/yr) * Density (lb/gal) / 2000 (ton/lbs)

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant

Measurement Devices

Exempt under Section 127.14(a) #7

Source Information:	
Analyzer Vent Rate (scf/hr)	2.12
Spectra Analyzers	14
GC Vent Rate (scf/hr)	0.04
GC Streams	36
Total Number of Measurement Vents to Atm	50.0
Potential Annual Hours of Operation (hr/yr)	8,760
Potential Volume Emitted (scf/yr)	18,561

Pollutant	**Per Analyzer**		**Per GC Stream**		**Total**	
	lb/hr	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Carbon Dioxide	0.000	0.001	0.000	0.000	0.00	0.016
Methane	0.09	0.399	0.00	0.007	1.33	5.822
VOC	0.03	0.124	0.00	0.002	0.41	1.806
n-Hexane	2.26E-04	0.001	3.76E-06	0.000	0.00	0.014
Benzene	3.56E-05	0.000	5.93E-07	0.000	0.00	0.002
Toluene	6.29E-05	0.000	1.05E-06	0.000	0.00	0.004
Ethylbenzene	3.56E-05	0.000	5.93E-07	0.000	0.00	0.002
Xylene	1.21E-05	0.000	2.01E-07	0.000	0.00	0.001
Total HAPs	4.83E-04	0.002	8.05E-06	0.000	0.01	0.031

MarkWest Liberty Midstream & Resources, L.L.C.
Harmon Creek Gas Plant

Harmon Creek Gas Analysis

Component	MW	Unit	Inlet Gas	Residue Gas - Recovery	Residue Gas	Stabilizer Overhead	CO2	C2+
Nitrogen	28.0135	mole %	0.41	0.51	0.48	0.10	0.00	0.00
CO2	44.01	mole %	0.10	0.20	0.12	0.16	96.84	0.06
H2S	34.1	mole %	0.00	0.00	0.00	0.00	0.00	0.00
Methane	16.042	mole %	77.01	97.41	92.99	44.04	0.03	0.10
Ethane	30.069	mole %	14.79	1.84	6.35	29.62	3.12	59.23
Propane	44.096	mole %	5.15	0.04	0.06	17.14	0.02	23.38
i-Butane	58.122	mole %	0.54	0.00	0.00	1.86	0.00	2.95
n-Butane	58.122	mole %	1.26	0.00	0.00	4.96	0.00	7.05
i-Pentane	72.149	mole %	0.25	0.00	0.00	0.79	0.00	1.69
n-Pentane	72.149	mole %	0.29	0.00	0.00	1.06	0.00	2.18
n-Hexane	86.175	mole %	0.05	0.00	0.00	0.20	0.00	3.46
n-Heptane	100.202	mole %	0.04	0.00	0.00	0.05	0.00	0.00
n-Octane	114.229	mole %	0.00	0.00	0.00	0.00	0.00	0.00
Benzene	78.122	mole %	0.008	0.00	0.00	0.00	0.00	0.00
Toluene	92.138	mole %	0.012	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	106.167	mole %	0.001	0.00	0.00	0.00	0.00	0.00
Xylene	106.16	mole %	0.002	0.00	0.00	0.00	0.00	0.00
Nonanes	128.255	mole %	0.002	0.00	0.00	0.00	0.00	0.00
Decanes Plus	142.282	mole %	0.021	0.00	0.00	0.00	0.00	0.00

	Component	MW	Unit	Inlet Gas	Residue Gas - Recovery	Residue Gas	Stabilizer Overhead	CO2	C2+
23	Nitrogen	28.0135	wt%	0.5530	0.8738	0.7852	0.0965	0.0000	0.0000
24	CO2	44.01	wt%	0.2119	0.5278	0.3121	0.2440	97.8220	0.1187
25	H2S	34.1	wt%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
26	Methane	16.042	wt%	77.0100	95.1232	87.5426	24.2604	0.0092	0.0736
27	Ethane	30.069	wt%	21.4104	3.3662	11.2128	30.5465	2.1522	48.5233
28	Propane	44.096	wt%	10.9331	0.1031	0.1442	25.9200	0.0166	27.2355
29	i-Butane	58.122	wt%	1.5110	0.0025	0.0011	3.7135	0.0000	3.8104
30	n-Butane	58.122	wt%	3.5257	0.0035	0.0013	9.8881	0.0000	9.4580
31	i-Pentane	72.149	wt%	0.8684	0.0000	0.0002	1.9617	0.0000	2.4280
32	n-Pentane	72.149	wt%	1.0073	0.0000	0.0005	2.6260	0.0000	3.1565
33	n-Hexane	86.175	wt%	0.1908	0.0000	0.0001	0.5960	0.0000	5.3212
34	n-Heptane	100.202	wt%	0.2026	0.0000	0.0000	0.1622	0.0000	0.0000
35	n-Octane	114.229	wt%	0.0110	0.0000	0.0000	0.0192	0.0000	0.0000
36	Benzene	78.122	wt%	0.0301	0.0000	0.0000	0.0000	0.0000	0.0000
37	Toluene	92.138	wt%	0.0532	0.0000	0.0000	0.0000	0.0000	0.0000
38	Ethylbenzene	106.167	wt%	0.0301	0.0000	0.0000	0.0000	0.0000	0.0000
39	Xylene	106.16	wt%	0.0102	0.0000	0.0000	0.0000	0.0000	0.0000
40	Nonanes	128.255	wt%	0.0123	0.0000	0.0000	0.0000	0.0000	0.0000
41	Decanes Plus	142.282	wt%	0.1438	0.0000	0.0000	0.0000	0.0000	0.0000
	*Dry Basis		VOC wt %	23.89	0.11	0.15	44.89	0.02	51.41
			LHV =	1158.81	916.57	949.85	1562.36	51.09	
			HHV =	1282.67	1022.94	1058.62	1715.11	61.37	
			Density (lb	0.0558	0.0433	0.0449	0.0768	0.1148	
			Gas MW=	20.77	16.43	17.04	29.16	43.57	
			HAP wt%=	0.4088	0.0000	0.0001	0.5960	0.0000	5.3212

Notes:

[a] The inlet gas composition is based on a sample collected on 8/1/2023 from the Harmon Creek plant feed inlet and a 30% factor is applied for conservatism. The residue gas and C2+ gas compositions are the annual average from GC readings.

[b] Stabilizer Overhead and CO2 compositions are modeled.

MARKWEST LIBERTY MIDSTREAM & RESOURCES LLC
1515 ARAPAHOE ST., TOWER 1
SUITE 1600
80202, DENVER
United States

Attention of : Mr. P. Jereza

Analysis Report

Report number	: **13087/00013734.1/L/23**	Date of sampling	: 08-01-2023
Main Object	: Inlet Sample	Place of sampling	: Harmon Creek Gas Plant
Report Date	: 08-16-2023	Date received	: 08-14-2023
Date of issue	: 08-14-2023	Date completed	: 08-14-2023
Sample object	: Inlet Sample	Sample number	: 15054521
Sample type	: Sampled		
Sample submitted as	: Natural Gas		
Marked	: Inlet line sample 8/1/23 for analysis only		

NAME	METHOD	UNIT	RESULT
Natural gas analysis	GPA 2261		
Hydrogen		mol %	<0.10
Oxygen		mol %	<0.03
Nitrogen		mol %	0.41
Carbon Dioxide		mol %	0.10
Methane		mol %	77.01
Ethane		mol %	14.79
Propane		mol %	5.15
Isobutane		mol %	0.54
N-Butane		mol %	1.26
Isopentane		mol %	0.25
N-Pentane		mol %	0.29
Hexanes Plus		mol %	0.20
Hydrogen Sulfide		mol %	<0.10
Total		mol %	100.00
Relative Density		-	0.72215
Compressibility Factor		-	0.99644
Gross Heating Value (Real)		Btu/CF	1264.1
Net Heating Value (Real)		Btu/CF	1146.5
Pressure Base		psi	14.696
Molecular Weight		#/#-mol	21.9
Hexanes	GPA 2172		
Hexanes Plus Mol Wt		units	84.9
Hexanes Plus Relative Density		#/#-mol	0.6951
Hexanes Plus Heating Value (Ideal)		Btu/CF	4622.7
Hexanes Plus Vapor Equivalent		CF/gal	25.89
Natural Gas Analysis, Extended	GPA 2286		
2,2-Dimethylbutane		mol %	<0.001
2-Methyl Pentane		mol %	0.351
3-Methyl Pentane		mol %	0.077

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Date of issue	: 08-14-2023	Date completed	: 08-14-2023
Sample object	: Inlet Sample	Sample number	: 15054521
Sample type	: Sampled		
Sample submitted as	: Natural Gas		
Marked	: Inlet line sample 8/1/23 for analysis only		

NAME	METHOD	UNIT	RESULT
n-Hexane		mol %	0.046
Methylcyclopentane		mol %	<0.001
Benzene		mol %	0.008
Cyclohexane		mol %	<0.001
2-Methyl Hexane		mol %	<0.001
3-Methyl Hexane		mol %	<0.001
Dimethylcyclopentanes		mol %	0.041
n-Heptane		mol %	<0.001
Methylcyclohexane		mol %	<0.001
Trimethylcyclopentanes		mol %	<0.001
Toluene		mol %	0.012
2-Methylheptane		mol %	<0.001
3-Methylheptane		mol %	<0.001
Dimethylcyclohexanes		mol %	0.001
n-Octane		mol %	0.002
Ethyl Benzene		mol %	<0.001
Xylenes (Total)		mol %	0.002
C9 Naphthenes		mol %	<0.001
C9 Paraffins		mol %	0.002
n-Nonane		mol %	<0.001
Decanes Plus		mol %	0.021

Signed by: Robert Boersma - Location Manager
Issued by: Saybolt LP
Place and date of issue: Pittsburgh - 08-14-2023

Attachment A

Regulatory Review

Regulatory Review

Federal New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) require new, modified, or reconstructed sources to control emissions to the level that is achievable by the best system for emission reduction as specified in the provisions of the applicable rule. The following section provides applicability determinations for each of the NSPS and NESHAP regulation to which the Harmon Creek 3 (HC3) project is potentially subject.

40 Code of Federal Regulations (CFR) Part 60 Subpart Dc – Standards of Performance for Small (10 to 100 MMBtu/hr) Industrial, Commercial, Institutional Steam Generating Units for Which Construction, Reconstruction, or Modification Commenced After June 9, 1989.

The heaters associated with HC3 will be rated at maximum design heat release greater than 10 MMBtu/hr and less than 100 MMBtu/hr on a LHV basis and will be constructed after June 9, 1989. However, process heaters (038) are excluded from the definition of a steam generating unit. The two (2) DeEthanizer HMO heaters (039 and 040) are subject to the requirements under NSPS Subpart Dc [40 CFR 60.41c].

40 CFR Part 60 Subpart OOOOb - Standards of Performance for Crude Oil and Natural Gas Facilities:

NSPS Subpart OOOOb establishes emission standards and compliance schedules for the control of GHG and VOC emissions from affected facilities that were constructed, modified, or reconstructed after December 6, 2022. The Harmon Creek 3 plant will be constructed after December 6, 2022 and is therefore subject to the requirements of NSPS OOOOb. The following sections outline the applicability of the various sources outlined under NSPS Subpart OOOOb:

Centrifugal Compressors – The standards under this subpart apply to a single centrifugal compressor. There are four (4) centrifugal compressors being proposed with the HC3 project: two (2) regen compressors and two (2) residue compressors. One (1) of the regen compressors will be for the ethane system and will have a negligible VOC and GHG content and thus, excluded from this subpart. The remaining three (3) compressors will be subject to the standards of this subpart.

Reciprocating Compressors – The standards under this subpart apply to a single reciprocating compressor. The only reciprocating compressor proposed for HC3 will be for CO_2 and will have a negligible VOC content. Therefore, the standards do not apply.

Process Controllers – The standards under this subpart apply to a collection of natural gas-driven process controllers. There are no natural gas-driven process controllers associated with the existing Harmon Creek facility or the HC3 project thus, these standards do not apply.

Storage Vessels – A tank battery, defined as one or more storage vessels manifolded together for liquid transfer, with the potential to emit 6 tpy or more of VOC or 20 tpy or more of methane is a storage vessel affected facility under this subpart. Tank batteries with potential emissions below the thresholds aforementioned are not subject to this subpart provided the owner/operator maintains records of potential emissions for the life of the storage vessel. There are no new storage vessels associated with the HC3 project and therefore, will not be subject to the standards of this subpart.

Process Unit Equipment – A process unit equipment affected facility is the group of all equipment within a process unit at an onshore natural gas processing plant. The HC3 project will be constructed after December 6, 2022 and therefore, will be subject to the standards of this subpart.

Sweetening Unit – A sweetening unit under this subpart is defined as a process device that removes hydrogen sulfide and/or carbon dioxide from the sour natural gas stream. There are no sweetening units associated with the HC3 project and thus, these standards do not apply.

Pneumatic Pumps – The standards under this subpart apply to a collection of natural gas-driven pumps. There are no natural gas-driven pneumatic pumps associated with the existing Harmon Creek facility or HC3 project and thus, these standards do not apply.

Attachment B

RACT III Analysis

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

CHAPTER 129. STANDARDS FOR SOURCES ADDITIONAL RACT REQUIREMENTS FOR MAJOR SOURCES OF NOx AND VOCs FOR THE 2015 OZONE NAAQS

Written notification, 25 Pa. Code §§129.111 and 129.115(a)

25 Pa. Code Sections 129.111 and129.115(a) require that the owner and operator of an air contamination source subject to the final-form RACT III regulations submit a notification describing how you intend to comply with the final-form RACT III requirements, and other information spelled out in subsection 129.115(a). The owner or operator may use this template to notify DEP. Notification must be submitted in writing or electronically to the appropriate Regional Manager located at the appropriate DEP regional office. In addition to the notification required by §§ 129.111 and 129.115(a), you also need to submit an applicable analysis or RACT determination as per § 129.114(a) or (i).

Is the facility major for NOx?	**Yes** ☐ **No** ☒
Is the facility major for VOC?	**Yes** ☒ **No** ☐

FACILITY INFORMATION						
Facility Name	Harmon Creek Gas Plant					
Permit Number	63-01011 **PF ID if known** 819388					
Address Line1	123 Point Pleasant Rd					
Address Line2						
City	Bulger	**State**	PA	**Zip**	15019	
Municipality	Smith		**County**	Washington		

OWNER INFORMATION					
Owner	MarkWest Liberty Midstream and Resources, L.L.C.				
Address Line1	1515 Arapahoe St.				
Address Line2	Tower 1, Suite 1600				
City	Denver	**State**	CO	**Zip**	80202
Email	nmwheldon@marathonpetroleum.com		Phone		(303) 542-0686

CONTACT INFORMATION					
Permit Contact Name	Alexandra M. Juarez				
Permit Contact Title	Environmental Engineer				
Address Line	4600 J. Barry Court				
City	Canonsburg	**State**	PA	**Zip**	15317
Email	ajuarez@marathonpetroleum.com			Phone	(412) 815-8886

Table 1 includes all air contamination sources that commenced operation on or before August 3rd, 2018. Air contamination sources determined to be exempt from permitting requirements are also included.

Table 1 - Source Information and RACT III Compliance, VOC

Source ID/ Plant ID	Source Name	Make	Location of Source	VOC PTE TPY	Exempt from RACT III (yes or no)	How do you intend to comply?	25 Pa Code RACT regulation, (list the applicable sections)
031 / H-1711	Cryo Plant 1 Regen Heater (11.84 MMBtu/hr)	Tulsa Heaters	Plant #1	0.98	Yes	N/A	§ 129.111(c)
037 / H-2711	Cryo Plant 2 Regen Heater (17.84 MMBtu/hr)	Tulsa Heaters	Plant #2	1.48	No	PRES	§ 129.112(c)2
038 / H-3711	Cryo Plant 3 Regen Heater (21.75 MMBtu/hr)	Tulsa Heaters	Plant #3	1.83	No	PRES	§ 129.112(c)2
033 / H-1767	De-Ethanizer HMO Heater 1 (48.15 MMBtu/hr)	Scelerin Heaters LLC	DeEth #1	4.01	No	PRES	§ 129.112(b)
034 / H-1768	De-Ethanizer HMO Heater 2 (48.15 MMBtu/hr)	Scelerin Heaters LLC	DeEth #1	4.01	No	PRES	§ 129.112(b)
039 / H-3767	De-Ethanizer 2 HMO Heater 1 (73.85 MMBtu/hr)	Tulsa Heaters	DeEth #2	6.21	No	PRES	§ 129.112(g)(1)(i)
040 / H-3768	De-Ethanizer 2 HMO Heater 2 (73.85 MMBtu/hr)	Tulsa Heaters	DeEth #2	6.21	No	PRES	§ 129.112(g)(1)(i)
036 / H-1769	Stabilization HMO Heater (11.99 MMBtu/hr)	Tulsa Heaters	Stabilizer #1	1.00	No	PRES	§ 129.112(c)2
035 / H-1775	De-Ethanizer Regen Heater (6.60 MMbtu/hr)	Tulsa Heaters	DeEth #1	0.55	Yes	N/A	§ 129.111(c)
C601	Process Flare	John Zink	Flare Pad	0.02	No	PRES	§ 129.112(c)8
102	Emergency Generator	Generac	Admin Building	0.02	Yes	N/A	§ 129.111(c)
102	Emergency Generator	Generac	Control Room	0.10	Yes	N/A	§ 129.111(c)
801	Pigging	N/A	Inlet	0.20	Yes	N/A	§ 129.111(c)
601	Compressor Rod Packing Venting	N/A	Throughout Facility	1.22	No	PRES	§ 129.112(c)2

MISC	Residue Compressor Dry Seal Venting	N/A	Throughout Facility	0.67, each	Yes	N/A	§ 129.111(c)
MISC	Regen Compressor Dry Seal Venting	N/A	Throughout Facility	0.70, each	Yes	N/A	§ 129.111(c)
MISC	Truck Loadout	N/A	Closed Darin Tank Bldg	1.06	No	PRES	§ 129.112(c)2
601	Planned Facility Blowdowns	N/A	Throughout Facility	3.17	No	CbC	§ 129.114(c)
MISC	Methanol Tanks	N/A	Various	0.36	Yes	N/A	§ 129.111(c)
--	Spectra Analyzers (Trivial Activity)	N/A	Throughout Facility	1.73 0.12, each	Yes	N/A	§ 129.111(c)
--	GC Buildings (Trivial Activity)	N/A	Throughout Facility	0.07	Yes	N/A	§ 129.111(c)
701	Connectors	N/A	Throughout Facility	3.54	No	CbC	§ 129.114(c)
701	Pump Seal	N/A	Throughout Facility	2.40	No	PRES	§ 129.112(c)2
701	Compressor	N/A	Throughout Facility	0.70	Yes	N/A	§ 129.111(c)
701	PSV	N/A	Throughout Facility	8.03	No	CbC	§ 129.114(c)
701	Valves	N/A	Throughout Facility	5.34	No	CbC	§ 129.114(c)

For the column with the title “How do you intend to comply”, compliance options are:

- Presumptive RACT requirement under §129.112 (**PRES**),
- Facility-wide averaging (**FAC**) §129.113,
- System-wide averaging (**SYS**) §129.113, or
- Case by case determination §129.114 (**CbC**).

Please provide the applicable subsection if source will comply with the presumptive requirement under §129.112.

RACT III Case-by-Case Proposal

Fugitive Component Groups

The plant-wide fugitive components have been grouped under one source for permitting purposes. However, under RACT the fugitive component groups are considered separate sources as follows:

a. Connectors
b. Pump Seals
c. Compressor
d. PSV
e. Valves

Compressors have potential VOC emissions less than 1.0 tpy and, thus, are exempt under 25 Pa. Code § 129.111(c). The Pump Seals have potential VOC emissions greater than 1.0 tpy and less than 2.7 tpy, and thus, comply with RACT by meeting 25 Pa. Code § 129.112(c)(2).

Connectors, PSVs, and Valves have potential VOC emissions greater than 2.7 tpy and thus, are subject to the case-by-case requirements in 25 Pa. Code § 129.114(c) which states: The owner or operator of a VOC air contamination source with the potential emission rate equal to or greater than 2.7 tons of VOC per year that is not subject to § 129.112 located at a major VOC emitting facility subject to § 129.111 shall propose a VOC RACT requirement or RACT emission limitation in accordance with subsection (d).

The following control technologies were considered as part of the case-by-case analysis for the Connectors and Valves component groups:

- Thermal Oxidation (TO)
- Regenerative Thermal Oxidation (RTO)
- Thermal Catalytic Oxidation (TCO)
- Carbon Adsorption
- Condensation
- Work Practice requirements

Thermal Oxidation (TO) and Regenerative Thermal Oxidation (RTO)

Thermal oxidation refers to the complete gas-phase combustion of VOCs to carbon dioxide and water vapor. Oxidation is achieved by heating the VOC exhaust in the presence of oxygen. Supplemental fuel (natural gas) is required to maintain combustion conditions. The destruction efficiency of thermal oxidation is typically 95% or greater with a combustion temperature of 1500 deg F and a retention time of 1.0 second. This is also dependent upon the quantity of VOC in the gas stream. For low-concentration VOC streams, a lower destruction efficiency can be expected. Thermal oxidation can be accomplished with or without heat recovery. Because these sources are throughout the plant, ductwork would have to be installed over every connector, PSV, and valve. The installation of ductwork over every connector, PSV, and valve is not technically feasible, and we have dismissed this option. There are no similar sources that are controlled in this manner.

Thermal Catalytic Oxidation (TCO)

Catalytic oxidation refers to complete combustion of VOCs to carbon dioxide and water through the use of an oxidation catalyst. Catalytic oxidation occurs at lower temperatures typically between 650 deg and 800 deg F. As with thermal oxidation, supplemental fuels (natural gas) is needed with dilute gas streams. Destruction efficiencies of 95% are typical. The catalyst slowly degrades over time and must be replaced on a periodic basis. Because these sources are throughout the plant, ductwork would have to be installed over every connector, PSV, and valve. The installation of ductwork over every connector, PSV, and valve is not technically feasible, and we have dismissed this option. There are no similar sources that are controlled in this manner.

Condensation

VOCs can be removed in the condensation process. This technology has been used in some cases to control high VOC concentration gas streams. In fact, in certain areas of the plant, where there are very low temperatures the gas is in liquid form. In gas streams consisting of a single VOC and no non-condensable gas, condensation occurs isothermally, or at a constant temperature. In gas streams consisting of non-condensables or VOCs with varied volatilities, condensation occurs along a temperature change. However, to achieve condensation of the vapor, ductwork would be required to capture the vented vapor from every connector, PSV, and valve and vessels for the condensation process would be required. As stated earlier, the installation of ductwork over every connector, PSV and valve is not technically feasible and condensation is not an option for these sources. There are no similar sources that are controlled in this manner.

Adsorption

VOCs can be removed using carbon or zeolites as adsorbents. However, these sources are throughout the plant and ductwork would be required over every connector, PSV, and valve. Installing ductwork over every connector, PSV, and valve within the facility is not technically feasible, and this option has been dismissed. There are no similar sources that are controlled in this manner.

Work Practice

The facility will be subject to the Equipment Leak Standard in 40 CFR Part 60 Subpart OOOOb (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution in accordance with the provisions in 60.5400b. Additionally, as a best management practice, new PORVs installed at the facility are equipped with bottom dome piping, new and replacement valves are low-emission valves.

Conclusion

VOC RACT for the Connector, PSV, and Valve source groups shall be to operate using good air pollution practices and to conduct a Leak Detection and Repair (LDAR) program as recommended in 40 CFR Part 60 Subpart OOOOb and continue to follow MPLX's best management practices.

Blowdown Emissions

The maintenance blowdowns at the facility have potential VOC emissions greater than 2.7 tpy and thus, are subject to the case-by-case requirements in 25 Pa. Code § 129.114(c) which states: The owner or operator of a VOC air contamination source with the potential emission rate equal to or greater than 2.7 tons of VOC per year that is not subject to § 129.112 located at a major VOC emitting facility subject to § 129.111 shall propose a VOC RACT requirement or RACT emission limitation in accordance with subsection (d).

Vapor Recovery

Vapor Recovery Units (VRUs) are commonly used to reduce emissions from crude oil and condensate storage tanks, but where VRUs are already in place the vapor collection system can be modified to capture emissions from other low-pressure vent sources found onsite including pipeline pigging operations, compressor seal and blowdown vents, and dehydrator vents. VRUs are normally driven by an electric motor. The keys to cost-effective VRU projects are a steady source and adequate quantity of crude oil, condensate, or other low-pressure sources of organic vapors, along with an economic outlet for the collected products. The potential volume of vapors will depend on the makeup of the collection system and the quantity and types of sources it is connected to.

The main challenge with using vapor recovery to control vapors from facility maintenance blowdowns is the unsteady and high-pressure nature of flows. The depressurization of compressors for maintenance will result in a short duration of flow to the vapor recovery unit before returning to no flow. Thus, the VRU would either need to be idled during periods when there are no planned maintenance events or sweep gas would be required to keep the VRU operational when there is no flow from blowdowns. Frequent idling and starting of any motor results in more than normal wear on the unit and a short lifespan of the equipment in addition to increased maintenance. To ensure steady flow to the VRU, sweep gas would have to be added to the process and would result in an increased flow to the process flare.

Vapor Destruction

Vapor destruction is achieved through a high-temperature oxidation process used to burn waste gases containing combustible components such as volatile organic compounds (VOCs), natural gas (or methane), and carbon monoxide (CO). The waste gases are piped to a remote, usually elevated location, and burned in an open flame in ambient air using a specially designed burner tip, auxiliary fuel, and, in some cases, assist gases like steam or air to promote mixing for nearly complete (e.g., ≥ 98%) destruction of the combustible components in the waste gas.

Routing new blowdown vents to the process flare is a safe and achievable option to reduced VOC emissions.

Conclusion

Due to the infrequent nature of blowdown events at the facility and potentially high-pressures, MPLX proposes to route facility maintenance blowdowns to the process flare to achieve 98% destruction efficiency.

Attachment C

BAT Analysis

Best Available Technology Review

Existing Process Flare and Enclosed Combustor

MarkWest Liberty Midstream and Resources, L.L.C., a fully owned subsidy of MPLX, hereinafter referred to as MPLX, is seeking authorization to construct and operate the Harmon Creek 2 Cryo (HC2). During maintenance and emergency situations, MPLX will require the blowdown of equipment associated with HC2. MPLX plans to route such vapors to the existing process flare. Because the most recent version of the GP5 excludes the use of open flares, MPLX submitted a plan approval application seeking authorization to control HC2 with the existing process flare. Per request of the Department, a BAT analysis for the installation and operation of an enclosed combustion device (ECD) in addition to the existing process flare was included in the application. MPLX would like to note that the Harmon Creek Gas Plant will remain a minor source after the implementation of HC2.

One Enclosed Combustion Device

As described in the plan approval application, MPLX obtained a quote for an ECD adequately sized for the HC2 process. The ECD was guaranteed the same destruction and removal efficiency (DRE) as the existing plant flare; thus, no emission reductions would be achieved. Based on the required purge and pilot gas rates to safely operate the ECD, an emissions increase would result from the operation of the unit, as shown in Table 1. Therefore, the existing flare meets BAT for this project.

Further, the Department has requested that MPLX consider installing multiple smaller ECDs or installing one with a DRE of 99%. In response, MPLX has evaluated the technical, environmental, and economic feasibility of the Department's request. The change in emissions associated with the addition of an ECD with 99% DRE is shown in Table 1.

Table 1. Summary of facility-wide emissions and change in emissions using the existing process flare and adding an ECD with 98% or an ECD with 99% DRE.

	Existing Process Flare	*Existing Process Flare and One (1) ECD with 98% DRE*		*Existing Process Flare and One (1) ECD with 99% DRE*	
Pollutant	Facility-wide PTE	Facility-wide PTE	Change in Emissions	Facility-wide PTE	Change in Emissions
VOC	38.63	38.64	+0.01	36.62	-2.01
NOx	31.42	31.87	+0.45	31.87	+0.45
CO	50.38	52.42	+2.04	52.42	+2.04

As shown in Table 1, routing HC2 to an ECD with a VOC DRE of 99% would result in a reduction of 2.01 tpy of VOC for a capital cost of $25M or greater. However, CO and NOx emissions would increase at the facility by 2.04 and 0.45 tpy, respectively.

A well-known flare manufacturer, Cimarron, has cautioned against using 99% DRE for permits, despite test data demonstrating that their ECDs performed above 99.9% under controlled test conditions. NSPS OOOOa testing conducted by the manufacturer does not use natural gas as fuel and is conducted under controlled conditions. However, typical operations at an oil and gas facility vary from the control conditions. Thus, the recommended guarantee by most enclosed combustor manufacturers is 98% DRE for permitting purposes. MPLX prefers to use a DRE of 98% for conservatism because the Department may establish permit limits based on potential emissions provided in the application.

Further, Zeeco guaranteed the quoted enclosed combustor DRE at 98%. Even with a DRE of 99%, solely considering the estimated minimum capital cost of the project at $25M, the cost per ton savings over a ten-year period would equate to approximately $1.24M/ton VOC. However, there would be an increase in NOx and CO emissions, resulting in an increase of 0.48 tpy of criteria pollutants facility-wide.

Multiple Smaller Enclosed Combustion Devices

MPLX has evaluated the feasibility of installing multiple smaller ECDs at the facility as requested by the Department. Each ECD requires a significant footprint for equipment and piping and, per API standards, must be constructed at a specific height and distance from the process. To accommodate multiple ECDs at the facility, MPLX would be required to acquire more land, create new disturbed acreage, and undergo timely permitting processes related to such projects.

To comply with API Standard 537 on Flare Details for Natural Gas Industries, each ECD at a facility would require a separate flare header to maintain an open path from process vents to the flares. Each new flare header would require the construction of foundation, steel racks, and piping resulting in an estimated minimum cost of $5M. The estimated cost for a flare header does not include the cost of an ECD or installation. Also, new flare header piping would result in an increase in fugitive component counts and associated emissions.

With each additional ECD, additional emissions from the combustion of pilot and purge gas would be generated. The facility-wide emissions using the existing process flare and an enclosed combustor are summarized in Table 1. The emission increases associated with the ECD providing a DRE of 98% show the pilot and purge combustion emissions. Thus, if multiple enclosed combustors were operated, there would be more emissions than those presented in the table above.

Summary

Due to the considerable footprint of each ECD requiring more land, increased emissions from the combustion of pilot and purge gas and fugitive components associated with new flare header piping, and the significant cost associated with even one ECD, MPLX has determined that installing ECD(s) at the facility is not technically, environmentally, or economically feasible. Thus, the existing flare at the facility is determined to meet BAT for this project.

Reciprocating Compressor Rod Packing and Measurement Device Vents

Emissions associated with the three (3) reciprocating compressor rod packing vents needed to compress residue gas for Harmon Creek 2 results in a facility-wide increase of 0.20 tpy of VOC. The measurement device venting for HC2 results in a facility-wide increase of 0.26 tpy of VOC. Per #31 of 25 Pa Code §127.14(a)(8), rod packing and measurement device venting from this project are exempt from the Plan Approval requirements of §127.11 and §127.12 because the uncontrolled VOC emissions from the project are less than 2.7 tons on a 12-month rolling basis. In addition to exemption #8, the measurement devices are exempt from permitting under 25 Pa Code §127.14(a)(7) because the gas chromatographs (GCs) and moisture analyzers are considered laboratory equipment used exclusively for chemical or physical analyses.

At the request of the Department, MPLX is providing a BAT analysis on rod packing emissions associated with the three (3) reciprocating compressors. A search for “rod packing” was conducted in the RBLC Database from 1/2017 through 9/2022 for all pollutants and no results were returned. Therefore, MPLX relied on technical expertise from the compressor manufacturer and facility personnel.

MPLX contacted Ariel Corporation in May 2022 to explore options to reduce rod packing emissions associated with the compressors. Based on reference material provided and discussions with Ariel representatives, the standard Ariel packings meet or exceed today's industry-standard requirements, and ongoing research and development efforts ensure the best possible seal. The new reciprocating compressors will be equipped with what Ariel identifies as low-emission packing.

Finally, the Department has suggested that MPLX consider using carbon adsorption canisters to control rod packing and measurement vents. In discussions with technical experts, risks were identified in association with the use of carbon adsorption canisters. The downstream design pressure from rod packing vents is 1440 psi, and with the obstruction of a vent line, back pressure could result in a dangerous overpressure of a carbon canister.

One option considered is routing low-pressure measurement device vents to the closed drain where vapors are controlled by the process flare. One known risk is the possible contamination of the sensitive GC equipment due to potential flowback. However, this method is not practiced at MPLX facilities, and other potential challenges and risks are unknown. The estimated cost is approximately $200,000 per vent to route vent streams to the closed drain. Eight (8) measurement device vents are proposed for HC2, and the total installation cost would be approximately $1.6M to control 0.26 tpy VOC.

Routing rod packing vents to the closed drain is not an option due to the low pressure of the closed drain system, which is approximately 1 psi. As mentioned earlier, the downstream design pressure from the rod packing vents is 1440 psi.

Another option to reduce emissions from low-pressure vents is by routing vents to a vapor recovery unit (VRU). The estimated range to acquire and install a VRU is approximately $1-2M. Because these vents are located throughout the facility, multiple VRUs and significant amounts of piping would be required to recover these vapors. The cost per ton reduction from just one (1) VRU, without considering the operation and maintenance, over a ten-year period would range from approximately $218,000/ton to $436,000/ton.

The high cost to install an emissions control for an insignificant emission reduction of 0.46 tpy is not economically reasonable. As referenced in 25 Pa Code §127.14(a), a plan approval is not required for the rod packing or measurement device vents. MPLX meets BAT by complying with the OOOOa standard requiring rod packing replacement every 26,000 hours or every 36 months.

Attachment D

LDAR Program
28VHP Boilerplate Special Conditions

Fugitive Components
Support Documentation

28VHP Boilerplate Special Condition Language		MPLX Practices
A	The requirements of paragraphs F and G shall not apply (1) where the Volatile Organic Compound (VOC) has an aggregate partial pressure or vapor pressure of less than 0.044 pounds per square inch, absolute (psia) at 68°F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list or by one of the methods described below to be made readily available upon request. The exempted components may be identified by one or more of the following methods: • piping and instrumentation diagram (PID); • a written or electronic database or electronic file; • color coding; • a form of weatherproof identification; or • designation of exempted process unit boundaries.	
B	Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes.	Construction of new and reworked piping, valves, pump systems, and compressor systems conforms with all applicable codes and is confirmed in construction bid language.
C	New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.	No new or reworked underground process pipelines are associated with Harmon Creek. Any new underground drain piping will be welded.
D	To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by Title 30 Texas Administrative Code Chapter 115 (30 TAC Chapter 115), shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in subparagraph A above. If an unsafe to monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe to monitor times. A difficult to monitor component for which quarterly monitoring is specified may instead be monitored annually.	To the extent possible, MPLX ensures that all valves and piping connections are reasonably accessible. There are no difficult-to-monitor or unsafe-to-monitor components at Harmon Creek. Should such components exist at a facility, they would be identified in a list that is available upon request.
E	New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter.	MPLX construction practices are consistent with these conditions. Hydraulic testing of new or reworked piping connections is conducted prior to installation. Any modified piping would undergo field

	Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the permit holder must complete either of the following actions within that time period; (1) a cap, blind flange, plug, or second valve must be installed on the line or valve; or (2) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once within the 72 hour period following the creation of the open ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve	nondestructive examination (NDE). Leak checks are performed prior to putting systems into service. Operations conducts daily AVO inspections. LDAR conducts weekly AVO inspections on pumps. MPLX's LDAR Program at the facility requires OEVs and OELs to be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. MPLX's standard is to only allow OELs and/or OEVs to exist on equipment that is not in service and follows the lockout and tagout procedures.
F	Accessible valves shall be monitored by leak checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. If a relief valve is equipped with rupture disc, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity.	Valves are monitored quarterly using Method 21. Sealless/leakless valves are not part of the Harmon Creek processes. There will be no relief valves with rupture discs in VOC service. Any relief valves with a rupture disc are equipped with a pressure-sensing device. All valves and relief valves in VOC service are monitored quarterly at Harmon Creek.

	A check of the reading of the pressure-sensing device to verify disc integrity shall be performed at least quarterly and recorded in the unit log or equivalent. Pressure sensing devices that are continuously monitored with alarms are exempt from recordkeeping requirements specified in this paragraph. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown. The gas analyzer shall conform to requirements listed in Method 21 of 40 CFR part 60, appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs is being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured. Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service.	There are no relief valves equipped with rupture discs in VOC service at Harmon Creek. However, it is standard that any rupture discs at the facility are equipped with a transmitter or switch which would alarm if the disc failed. Transmitters/switches are considered critical and thus, would be inspected during critical instrumentation rounds. The gas analyzer used for monitoring equipment under this program meets Method 21 requirements. The resurvey requirements described in this section are consistent with MPLX's LDAR Program at the facility.
G	Except as may be provided for in the special conditions of this permit, all pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with an automatic seal failure detection and alarm system need not be monitored. These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.	All pumps in VOC service are monitored via Method 21 monthly. Compressors in VOC service are monitored at least quarterly via OGI.
H	Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 parts per million by volume (ppmv) or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired.	Valves or connectors found to be emitting VOC in excess of 500 ppmv are tagged and replaced or repaired.

	Damaged or leaking pump, compressor, and agitator seals found to be emitting VOC in excess of 2,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within 5 days and a record of the attempt shall be maintained.	Upon detection of a leak from pump seals or compressor seals, the component is tagged and replaced or repaired. The first attempt repair requirements described in this section are consistent with MPLX's LDAR Program at the facility.
I	A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging within 15 days of the detection of the leak. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC 115.782 (c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC 115.782 (c)(1)(B)(i)(I), the TCEQ Regional Manager and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.	The repair requirements described in this section are consistent with MPLX's LDAR Program at the facility. Emissions from a unit shutdown are evaluated to determine if a DOR is appropriate. DORs are identified with a weatherproof tag and tracked via the LeakDas database. 30 TAC 115.782 (c)(1)(B)(i)(II) requires mass emission rates to be calculated using the EPA correlation approach. MPLX uses the LeakDas database to track leaks, which calculates emissions using the EPA correlation approach. MPLX has reviewed DOR data and at no point has cumulative daily emissions from all components on the DOR list exceeded the emissions that would result from the next scheduled shutdown. MPLX will perform the calculation as required and make the appropriate notifications to PADEP.
J	Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95% of the instrument readings	The recordkeeping requirements described in this section are consistent with MPLX's LDAR Program at the facility. Operations conducts daily AVO inspections via walkthroughs and makes note of such inspections.

	recorded. Records of physical inspections shall be noted in the operator's log or equivalent.	
K	Alternative monitoring frequency schedules of 30 TAC '' 115.352 - 115.359 or National Emission Standards for Organic Hazardous Air Pollutants, 40 CFR Part 63, Subpart H, may be used in lieu of Items F through G of this condition.	
L	Compliance with the requirements of this condition does not assure compliance with requirements of 30 TAC Chapter 115, an applicable New Source Performance Standard (NSPS), or an applicable National Emission Standard for Hazardous Air Pollutants (NESHAPS) and does not constitute approval of alternative standards for these regulations.	

The Harmon Creek LDAR Program monitoring frequency and detection levels meet the 28VHP requirements and are shown in the table below:

Component Type	Monitoring Frequency	Detection Level (PPMV)
Compressor	Quarterly/Annually	10,000 (OGI) / 500
Connector	Quarterly/Annually	10,000 (OGI) / 500
Pressure Relief	Quarterly	500
Valve	Quarterly	500
Pump	Monthly	500

Attachment E

Methanol Questionnaire

Standard Questions Pertaining to Methanol Use

1. Will your facility use methanol for de-icing or as an antifreeze in the natural gas conveyance and/or treatment process? [25 Pa. Code §127.12(a)(2)]
   Yes.
2. Will your facility receive any natural gas that will have methanol in it? [25 Pa. Code §127.12(a)(2)]
   Based on the gas analysis provided to the Department on 6/16/2021, methanol was not present in detectable quantities in the facility inlet stream.

If "no" to 1 and 2, disregard remaining questions. If "yes" to either 1 or 2, please answer the remaining questions.

3. What will be the total volume of methanol used per calendar year at the facility? [25 Pa. Code §127.12(a)(2)]
   No greater than 5 gallons of methanol is used per year currently. MPLX calculated potential emissions based on a conservative throughput to account for HC2 and HC3.
4. What will be the total volume of methanol used per calendar year for each well that will send gas to the facility? [25 Pa. Code §127.12(a)(2)]
   Based upon analytical data, methanol was non-detect in the inlet stream in 2021.
5. Is the methanol used continuously throughout the year or seasonally? Please explain. [25 Pa. Code §127.12(a)(2)]
   Methanol is used periodically throughout the year as needed. The same is expected for HC2 and HC3.
6. Where is the methanol injected into the system? If at the facility, please identify each injection point in your process flow diagram. [25 Pa. Code §127.12(a)(2)]
   Methanol will continue to be injected from the injection pump upstream of the DeMethanizer, thus incorporating methanol into the plant process.
7. Please account for the final disposition of the methanol at your facility. Examples would include methanol contained in collected wastewater (produced water, or "slop tank"), remaining in the dried natural gas, contained in the rich glycol, and contained in the glycol sent to the reboiler. [25 Pa. Code §127.12(a)(2)]
   The final disposition of the methanol at the facility is in the amine closed drain or Y-grade product pipeline.
8. Please quantify your facility's annual methanol emissions including any fugitive emissions and stack emissions, e.g., flash tank and reboiler vents. Be sure to include the calculations and supporting documentation. [25 Pa. Code §127.12(a)(2)]
   Please see Detailed Emission Estimates provided in the Plan Approval application.