

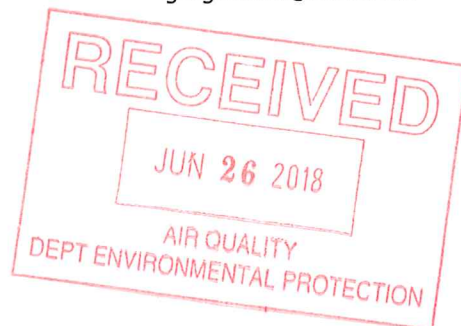


Shell Pipeline Company LP

701 Poydras St
New Orleans, LA 70139
greg.smith@shell.com

June 20, 2018

Mr. Mark Gorog
Bureau of Air Quality
Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222-4745



Subject: *Shell Pipeline Company, LP
Falcon Ethane Pipeline Project – Houston Custody Transfer Meter Station
Request for Determination of Sources of Minor Significance and Exemption from Plan
Approval under PA Code § 127.14*

Mr. Gorog:

Shell Pipeline Company, LP (Shell) is pleased to submit this Request for Determination (RFD) to the Pennsylvania Department of Environmental Protection (PADEP) for review and approval.

Shell is requesting exemption from plan approval in accordance with § 127.14(a)(8), # 31 (sources of uncontrolled VOC emissions not addressed elsewhere in this exemption listing modified or newly added, such that emission increases are less than 2.7 tpy) and #35 (sources emitting inert gases only, such as argon, helium, krypton, neon, and xenon; pure constituents of air such as nitrogen, oxygen, or carbon dioxide; or methane or ethane) for the associated equipment, fugitives and temporary flaring at the Houston Custody Transfer Meter Station.

This RFD application contains the following information:

RFD application form;
Potential to Emit (PTE) calculations; and
Area location map.

Please contact Mary Gerschefski, Falcon HSSE Manager, at (832) 762-2585 or Mary.Gerschefski@shell.com if you have any questions or need additional information.

Sincerely,

Greg Smith
Shell Pipeline Company LP
VP Operations

cc: Mary Gerschefski, Shell Pipeline Company LP
Thomas Samarco, Ramboll US Corporation

Prepared for:



Shell Pipeline Company, LP

Submitted to:

**Pennsylvania Department for Environmental Protection
Bureau of Air Quality**

Prepared by:

Ramboll US Corporation

Date:

June 2018

Project Number:

1690007308

REQUEST FOR DETERMINATION OF SOURCES OF MINOR SIGNIFICANCE AND EXEMPTION FROM PLAN APPROVAL UNDER PA CODE § 127.14

Ramboll US Corporation
2009 Mackenzie Way
Suite 100
Cranberry Township, PA 16066
USA
T +1 724 720 9389
www.ramboll-environ.com

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1 Area Location Map

1.0

RFD Application Form



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

**Request for Determination of Changes of Minor Significance
and Exemption from Plan Approval/Operating Permit
Under Pa Code §127.14 or §127.449**

A. Type of Request																							
Exemption from Plan Approval Select all that apply (see Instructions): http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf ☐ Minor Sources or classes of sources, pursuant to 25 Pa. Code § 127.14(a)(1)-(7). ☒ Other sources and classes of sources of minor significance, pursuant to 25 Pa. Code § 127.14(a)(8). ☐ Physical changes to sources of minor significance, pursuant to 25 Pa. Code § 127.14(a)(9). ☐ Additional physical changes of minor significance that do not add new equipment, pursuant to 25 Pa. Code § 127.14(c)(1). ☐ Additional physical changes of minor significance that add new equipment, pursuant to 25 Pa. Code § 127.14(c)(2). ☐ Changes due to de minimis increases in emissions, pursuant to 25 Pa. Code § 127.449.	Exemption from Operating Permit Select all that apply (see Instructions): http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf ☒ Other sources and classes of sources of minor significance, pursuant to 25 Pa. Code § 127.14(a)(8). ☐ Physical changes to sources of minor significance, pursuant to 25 Pa. Code § 127.14(a)(9). ☐ Additional physical changes of minor significance that do not add new equipment, pursuant to 25 Pa. Code § 127.14(c)(1). ☐ Additional physical changes of minor significance that add new equipment, pursuant to 25 Pa. Code § 127.14(c)(2). ☐ Changes due to de minimis increases in emissions, pursuant to 25 Pa. Code § 127.449. (Must have valid operating permit conditions authorizing de minimis increases.)																						
B. Facility/Company Information																							
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Facility/Company Name: Shell Pipeline Company, LP</td> <td style="width: 50%;">Plant Name (if applicable): Houston Custody Transfer Meter Station</td> </tr> <tr> <td colspan="2">Site Address: Latitude: 40.26434 Longitude: -80.26056</td> </tr> <tr> <td>Municipality: Chartiers Township</td> <td>County: Washington</td> </tr> <tr> <td colspan="2">Mailing Address (if different): Attn: David Mulkey 150 North Dairy Ashford Road, Building A, Second Floor, Houston, TX 77079</td> </tr> <tr> <td colspan="2">Federal Employer Identification Number (EIN) (if applicable):</td> </tr> <tr> <td>Current Operating Permit No. (if applicable): N/A</td> <td>NAICS Code:</td> </tr> <tr> <td>Person Completing Form: Thomas Samarco</td> <td>Affiliation: Environmental Consultant</td> </tr> <tr> <td rowspan="2">Address (if different from facility/company): 2009 Mackenzie Way Suite 100, Cranberry Township, PA 16066</td> <td>Telephone: (724) 720 - 9389</td> </tr> <tr> <td>E-Mail: tsamarco@ramboll.com</td> </tr> <tr> <td>Facility/Company Contact Person: Mary Gerschefski</td> <td>Title: Project HSSE Manager</td> </tr> <tr> <td rowspan="2">Address (if different from facility/company): 150 North Dairy Ashford Road Houston, TX 77079</td> <td>Telephone: (832) 762 - 2585</td> </tr> <tr> <td>E-Mail: Mary.Gerschefski@shell.com</td> </tr> </table>		Facility/Company Name: Shell Pipeline Company, LP	Plant Name (if applicable): Houston Custody Transfer Meter Station	Site Address: Latitude: 40.26434 Longitude: -80.26056		Municipality: Chartiers Township	County: Washington	Mailing Address (if different): Attn: David Mulkey 150 North Dairy Ashford Road, Building A, Second Floor, Houston, TX 77079		Federal Employer Identification Number (EIN) (if applicable):		Current Operating Permit No. (if applicable): N/A	NAICS Code:	Person Completing Form: Thomas Samarco	Affiliation: Environmental Consultant	Address (if different from facility/company): 2009 Mackenzie Way Suite 100, Cranberry Township, PA 16066	Telephone: (724) 720 - 9389	E-Mail: tsamarco@ramboll.com	Facility/Company Contact Person: Mary Gerschefski	Title: Project HSSE Manager	Address (if different from facility/company): 150 North Dairy Ashford Road Houston, TX 77079	Telephone: (832) 762 - 2585	E-Mail: Mary.Gerschefski@shell.com
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C. Project Description																							
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"> Project Type: ☒ New construction ☐ Modification ☐ Remediation </td> <td style="width: 67%; vertical-align: top;"> ☐ Other (see Instructions) http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf </td> </tr> </table>		Project Type: ☒ New construction ☐ Modification ☐ Remediation	☐ Other (see Instructions) http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf																				
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Total number of sources in project: 3

Description of project (may include process description, site diagram, and any other pertinent information – see Instructions (<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf>) and attach supporting documents in Section F. as needed):

The ethane stream produced from the fractionator operations will be moved into the pipeline system as a liquid. The inlet pressure will be adequate to move the desired material to the Pennsylvania Chemical Plant at a delivery pressure meeting the normal inlet of 1160 psig. The minimum inlet pressure to the plant will be 940 psig which will keep the ethane in a liquid state. The nominal discharge pressure from the fractionators will be in the 1400 psig range.

The Pennsylvania Chemical Plant will receive the ethane feedstock via a proposed 97.5-mile pipeline system comprised of two main segments (See Figure 1). One leg starts at the MarkWest Houston Plant approximately 31.36 miles south of Monaca. This segment will be 12" diameter pipeline to the Junction Custody Transfer Meter Station. The segment from the Junction Custody Transfer Meter Station to Monaca Line Integrity Meter Station will be 16" diameter pipeline.

The second leg starts at the MarkWest Cadiz Plant and travels approximately 10.87 miles north to a point where it intersects the Scio pipeline segment traveling in a north-easterly direction. The Cadiz line is a 10" diameter segment and it will connect into the Scio line via a wye connection approximately 2 miles downstream of the Momentum Scio Plant. The Scio segment is 12" diameter pipe along its entire length traversing Ohio, West Virginia and Pennsylvania a distance of 51.55 miles.

At the point where the Scio segment meets the Houston line, the two pipeline segments will be wye connected at the junction point. From the junction into the Pennsylvania Chemical Plant, one 16" diameter line will be used to deliver ethane into the plant. The junction is approximately 3.65 miles south of the plant and this distance is included in the Houston to Monaca pipeline segment length previously mentioned.

**Request for Determination of Changes of Minor Significance and Exemption from
Plan Approval/Operating Permit Under 25 Pa. Code § 127.14 or §127.449**

D. Source Description

Complete a separate sheet for each source included in the project. For projects with more than one source, make additional copies of this page or download from DEP's Air Quality/Permits Web site (www.depweb.state.pa.us, keyword: Request for Determination.)

Source Name: Fugitive Emissions

Source Category Code and Description (2700-BK-DEP4103.pdf): **99.999 Other Miscellaneous Sources**

Source location (if source is portable, submit a separate Request For Determination (RFD) application for each operating location): **Latitude: 40.26434 Longitude: -80.26056**

Type: ☒ Stationary ☐ Portable (Enter number of days in operation at this location: ____)

Is equipment existing or proposed? ☐ Existing ☒ Proposed

Actual or Planned Date of Installation: **TBD**

Source Description (see Instructions (<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf>) for examples of applicable information, attach supporting documents in Section F, and provide separate justification for any document designated as Confidential Business Information):

Fugitive emissions coming from flanges, manual valves, actuated valves, automatic samplers, CO2 moisture analysers, pressure indicators, thermowell analysers, basket strainers, prover traps and prover launcher.

Is the source subject to any New Source Performance Standards (NSPS) or National Emission Standards for Hazardous Air Pollutants (NESHAP) or Maximum Achievable Control Technology (MACT) standard? If yes, specify federal citation including Subpart.

☐ Yes Subpart: _____ ☒ No

You must enter potential emissions below. If also reporting actual emissions, provide the actual emission amounts and calculations as attachment(s) in Section F. of this RFD.

Pollutant(s) (from Instructions)	Emissions (lbs/hr)*	Emissions (tons/year)*	Calculation Method Code Appendix B
PM	N/A	N/A	---
PM-10	N/A	N/A	---
PM-2.5	N/A	N/A	---
SO _x	N/A	N/A	---
CO	N/A	N/A	---
NO _x	N/A	N/A	---
VOC	0.11	0.50	16 (Attachment A)
Total HAPs**	0.11	0.50	16 (Attachment A)

Will the construction or modification of this source increase emissions from other sources at the facility?

☐ Yes (Describe and quantify emissions on separate sheet)

☒ No

Is the construction or modification of the source subject to 25 Pa. Code, Chapter 127, Subchapter E, New Source Review (NSR) requirements or Prevention of Significant Deterioration (PSD) of Air Quality regulations at Subchapter D?

☐ Yes ☒ No

* Must enter value or N/A

** For speciated HAPs (see Instructions (<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf>) for required speciated HAPs) or other pollutants, please attach additional sheets in Section F.

**Request for Determination of Changes of Minor Significance and Exemption from
Plan Approval/Operating Permit Under 25 Pa. Code § 127.14 or §127.449**

D. Source Description

Complete a separate sheet for each source included in the project. For projects with more than one source, make additional copies of this page or download from DEP's Air Quality/Permits Web site (www.depweb.state.pa.us, keyword: Request for Determination.)

Source Name: Pig Launcher

Source Category Code and Description ([2700-BK-DEP4103.pdf](#)): **99.999 Other Miscellaneous Sources**

Source location (if source is portable, submit a separate Request For Determination (RFD) application for each operating location): **Latitude: 40.26434 Longitude: -80.26056**

Type: ☒ Stationary ☐ Portable (Enter number of days in operation at this location: _____)

Is equipment existing or proposed? ☐ Existing ☒ Proposed

Actual or Planned Date of Installation: **TBD**

Source Description (see Instructions (<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf>) for examples of applicable information, attach supporting documents in Section F, and provide separate justification for any document designated as Confidential Business Information):

Emissions from opening and venting pig launcher for pipeline. Assume one pigging operation per year.

Is the source subject to any New Source Performance Standards (NSPS) or National Emission Standards for Hazardous Air Pollutants (NESHAP) or Maximum Achievable Control Technology (MACT) standard? If yes, specify federal citation including Subpart.

☐ Yes Subpart: _____ ☒ No

You must enter potential emissions below. If also reporting actual emissions, provide the actual emission amounts and calculations as attachment(s) in Section F. of this RFD.

Pollutant(s) (from Instructions)	Emissions (lbs/hr)*	Emissions (tons/year)*	Calculation Method Code Appendix B
PM	N/A	N/A	---
PM-10	N/A	N/A	---
PM-2.5	N/A	N/A	---
SO _x	N/A	N/A	---
CO	N/A	N/A	---
NO _x	N/A	N/A	---
VOC	6.54	3.27E-03	16 (Attachment A)
Total HAPs**	6.54	3.27E-03	16 (Attachment A)

Will the construction or modification of this source increase emissions from other sources at the facility?

☐ Yes (Describe and quantify emissions on separate sheet)
☒ No

Is the construction or modification of the source subject to 25 Pa. Code, Chapter 127, Subchapter E, New Source Review (NSR) requirements or Prevention of Significant Deterioration (PSD) of Air Quality regulations at Subchapter D?

☐ Yes ☒ No

* Must enter value or N/A

** For speciated HAPs (see Instructions (<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf>) for required speciated HAPs) or other pollutants, please attach additional sheets in Section F.

Complete a separate sheet for each source included in the project. For projects with more than one source, make additional copies of this page or download from DEP's Air Quality/Permits Web site (www.depweb.state.pa.us, keyword: Request for Determination.)

Source Category Code and Description (2700-BK-DEP4103.pdf): 99.999 Other Miscellaneous Sources

Type: ☐ Stationary ☒ Portable (Enter number of days in operation at this location: 1)

Actual or Planned Date of Installation: **TBD**

A temporary flare will be utilized during the commissioning phase of the pipeline and flaring will occur for no longer than 24 hours. The flare vendor is yet to be chosen but for emission calculation purposes we assumed a Zeeco Sonic flare with a destruction efficiency of 98%.

☐ Yes Subpart: _____ ☒ No

Pollutant(s) (from Instructions)	Emissions (lbs/hr)*	Emissions (tons/year)*	Calculation Method Code Appendix B
PM	0.66	0.01	16 (Attachment A)
PM-10	0.66	0.01	16 (Attachment A)
PM-2.5	0.66	0.01	16 (Attachment A)
SO _x	N/A	N/A	---
CO	48.64	0.58	16 (Attachment A)
NO _x	5.67	0.07	16 (Attachment A)
VOC	3.97	0.05	16 (Attachment A)
Total HAPs**	3.97	0.05	16 (Attachment A)

☐ Yes (Describe and quantify emissions on separate sheet)
☒ No

☐ Yes ☒ No

** For speciated HAPs (see Instructions (<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf>) for required speciated HAPs) or other pollutants, please attach additional sheets in Section F.

**Request for Determination of Changes of Minor Significance and Exemption from
Plan Approval/Operating Permit Under 25 Pa Code §127.14 or §127.449**

E. Exemption History

Identify all sources exempted within the last five years from plan approval/operating permit requirements for one of the following reasons: 1. Request for Determination (RFD), 2. Exemption List, or 3. De minimis emissions provisions of 25 Pa. Code §127.449 (see Instructions) (<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf>):

Reason for Exemption (check one)				
Source Name	Date of Installation	RFD	Exemption List	De Minimis
		☐	☐	☐
		☐	☐	☐
		☐	☐	☐
		☐	☐	☐
		☐	☐	☐
		☐	☐	☐

F. List of Attached Documents (see Instructions) (<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf>)

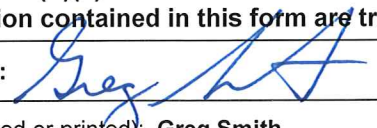
List all supporting documents attached to this application. If any document contains Confidential Business Information (CBI), provide justification on separate attachment (see Instructions) (<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf>).

Confidential?	Description of Attachment
☐	Figure 1 – Area Location Map
☐	Attachment A – Potential to Emit Calculations
☐	
☐	
☐	
☐	
☐	
☐	
☐	
☐	

G. Signature of Responsible Person or Authorized Designee (see Instructions)

(<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77119/2700-BK-DEP4103.pdf>)

I, Greg Smith, certify under penalty of law as provided 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 contained in this form are true, accurate, and complete.

Signature:  Title: VP Operations Date: 6 / 20 / 2018

Name (typed or printed): Greg Smith

Telephone: (504) 425-4474

Address (if different from site address):

701 Poydras St
New Orleans, LA 70139

E-Mail Address:

greg.smith@shell.com

Note: Please make a copy of this application and all attachments for your records and maintain all information related to this application for review by DEP.

OFFICIAL USE ONLY

RFD #: 99-00514Date Received: 6/26/2018Reviewed By: Edward F. Oms
ALEXANDER SANDY

- ☒ A plan approval is not required for this source (See 25 Pa. Code Section 127.14(a)(1)-(9))
- ☒ An operating permit is not required for this source (See 25 Pa. Code Section 127.443(a))
- ☐ The source(s) do(es) not qualify for exemption. Applicant is required to submit a plan approval application.
- ☐ The source(s) do(es) not qualify for exemption. Applicant is required to submit an operating permit application.

Signature

Edward F. Oms, P.E. Environmental Eng'g Mgr
ALEXANDER SANDY, ARES
Name and Title

Date

3/1/2019

Remarks:

SEE LETTER TO APPLICANT DATED 3/1/2019.

Conditions:

Attachment A
PTE Calculations

Shell Pipeline Company LP
Houston Custody Transfer Meter Station

Emissions Summary

Emission Source	EPN	VOC		NO _x		CO		PM ₁₀		PM _{2.5}		CO ₂		CH ₄	
		lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
Exiting Emissions		0.11	0.50	--	--	--	--	--	--	--	--	0.31	1.37	2.23	9.78
Flare Emissions	FL-1	6.54	3.27E-03	--	--	--	--	--	--	--	--	17.84	0.01	127.27	0.05
Temperature Flare	FL-1	3.97	0.05	5.67	0.07	48.64	0.58	0.66	0.01	0.66	0.01	10,370.37	124.37	37.51	0.45
TOTAL EMISSIONS		10.63	0.55	5.67	0.07	48.64	0.58	0.66	0.01	0.66	0.01	10,388.53	125.75	167.01	10.29
MAXIMUM OPERATING SCHEDULE		Hour/Day		Days/Week		Weeks/Year		Hours/Year		Hours/Year		Hours/Year		Hours/Year	
		24		7		52		8760		8760		8760		8760	

Shell Pipeline Company LP
Houston Custody Transfer Meter Station
Facility Information

<u>Site General Information</u>	
<u>Administrative Information</u>	
Company Name	Shell Pipeline Company LP
Facility/Well Name	Houston Custody Transfer Meter Station
Nearest City/Town	Houston
Latitude/Longitude	40.2634, -80.26056
County	Washington

<u>Technical Information</u>	
Ethane Flaring (MMSCF/year):	1.18

<u>Equipment/Process Types</u>	<u>How many for this project?</u>
Fugitives	YES
IC Engines	0
Turbines	0
Compressors (electric)	0
Diesel Engines	0
Heaters-Boilers	0
Separators	0
Oil / Condensate Tanks	0
Produced Water Tanks	0
Miscellaneous Tanks	0
Loading Jobs	0
Glycol Units	0
Amine Units	0
Vapor Recovery Units	0
Flares-Vapor Combustors	1
Thermal Oxidizers	0

Shell Pipeline Company LP
Houston Custody Transfer Meter Station
Physical Properties

Process Streams		Status: From Block To Block	Flare Pilot		Liquid Ethane		Gas Ethane	
Composition					Solved	Solved		
Phase: Total					VSSL-100	MIX-100	VSSL-100	
Std. Vapor Volumetric Flow			MMSCFD		MMSCFD	MMSCFD	MMSCFD	
Methane			—		0.01	—	0.01	0.01
Ethane			—		1.14	—	1.14	1.14
Propane			1.20E-03		0.01	—	0.01	0.01
Isobutane			—		0.01	—	0.01	0.01
n-Butane			—		0.01	—	0.01	0.01
Isopentane			—		2.36E-03	—	2.36E-03	2.36E-03
n-Pentane			—		2.36E-03	—	2.36E-03	2.36E-03
n-Hexane			—		1.89E-03	—	1.89E-03	1.89E-03
n-Heptane			—		4.72E-04	—	4.72E-04	4.72E-04
Carbon Dioxide			—		1.30E-03	—	1.30E-03	1.30E-03
Oxygen			—		—	—	—	—
Mass Fraction			%		%	%	%	%
Methane			—		0.52	—	0.52	0.52
Ethane			—		94.46	—	94.46	94.46
Propane			100.00		1.44	—	1.44	1.44
Isobutane			—		0.95	—	0.95	0.95
n-Butane			—		0.95	—	0.95	0.95
Isopentane			—		0.47	—	0.47	0.47
n-Pentane			—		0.47	—	0.47	0.47
n-Hexane			—		0.45	—	0.45	0.45
n-Heptane			—		0.13	—	0.13	0.13
Carbon Dioxide			—		0.16	—	0.16	0.16
Oxygen			—		—	—	—	—
Mole Fraction			%		%	%	%	%
Methane			—		1.00	—	1.00	1.00
Ethane			—		98.29	—	98.29	98.29
Propane			100.00		1.00	—	1.00	1.00
Isobutane			—		0.50	—	0.50	0.50
n-Butane			—		0.50	—	0.50	0.50
Isopentane			—		0.20	—	0.20	0.20
n-Pentane			—		0.20	—	0.20	0.20
n-Hexane			—		0.16	—	0.16	0.16
n-Heptane			—		0.04	—	0.04	0.04
Carbon Dioxide			—		0.11	—	0.11	0.11
Oxygen			—		—	—	—	—
Mass Flow			lb/h		lb/h	lb/h	lb/h	lb/h
Methane			—		20.78	—	20.78	20.78
Ethane			—		3,750.82	—	3,750.82	3,750.82
Propane			5.81		57.12	—	57.12	57.12
Isobutane			—		37.65	—	37.65	37.65
n-Butane			—		37.65	—	37.65	37.65
Isopentane			—		18.69	—	18.69	18.69
n-Pentane			—		18.69	—	18.69	18.69
n-Hexane			—		17.86	—	17.86	17.86
n-Heptane			—		5.19	—	5.19	5.19
Carbon Dioxide			—		6.27	—	6.27	6.27
Oxygen			—		—	—	—	—
Temperature	°F		40.00		40.00	—	65.00	65.00
Pressure	psig		1.00		1,160.00	—	2.00	2.00
Molecular Weight	lb/lbmol		44.10		30.65	—	30.65	30.65
Gross Ideal Gas Heating Value	Btu/ft³		2,572.00		1,797.71	—	1,797.71	1,797.71
Mass Flow	lb/h		5.81		3,970.73	—	3,970.73	3,970.73

Shell Pipeline Company LP
Houston Custody Transfer Meter Station
Fugitive Emissions

Background Information

Total fugitive component counts are based on actual equipment counts at the facility.

Emissions Estimate

Liquid Equipment/Service	# Components	SOCMI Emission Factor ^a	Equipment-Specific Bleed Rates ^b	Short-Term TOC Emissions	Annual TOC Emissions
		(lb TOC/hr/component)	scf/min	(lb/hr)	(ton/yr)
Flanges	180	0.0005		0.09	0.39
Manual Valves	80	0.0089		0.71	3.12
Actuated Valves	14	0.0089		0.12	0.55
Automatic Sampler	3	--	0.035	0.51	2.23
CO ₂ Moisture Analyzer	0	--	0.07	0.00	0.00
Pressure Indicators	13	0.033		0.43	1.88
Thermowell	10	0.033		0.33	1.45
Basket Strainer	3	0.033		0.10	0.43
Prover Trap	1	0.033		0.03	0.14
Prover Launcher	1	0.033		0.03	0.14
Total				2.36	10.34

^a Emission factors taken from EPA document EPA-453/R-95-017; November, 1995; pp. 2-12.

^b Equipment-Specific bleed rates provided by manufacturer.

Speciated Fugitive Emissions^a

Component	Total Fugitive Emissions (lb/hr)	Total Fugitive Emissions (ton/year)
Methane	0.01	0.05
Ethane	2.23	9.78
Propane	0.03	0.15
Isobutane	0.02	0.10
n-Butane	0.02	0.10
Isopentane	0.01	0.05
n-Pentane	0.01	0.05
n-Hexane ^a	0.01	0.05
n-Heptane	3.09E-03	0.01
Carbon Dioxide	3.73E-03	0.02
Oxygen	--	--
Total	2.36	10.35
Total CO₂	3.73E-03	0.02
Total Methane	0.01	0.05
Total CO₂e	0.31	1.37
C₂H₆	2.23	9.78
TOC	2.36	10.34
VOC	0.11	0.50

^a Fugitive emissions speciation is based on inlet pipeline composition.

Pigging Emissions

EPN	PIG-1
Identifier	Pipeline Pig Launcher

Describe this event in detail, include specifically what is being done and how it is being done.	Emissions from opening and venting the pig launcher. Pipeline from Houston is 12" diameter and emissions assume one pigging operation per year.
--	---

Actual Volume of the Vented Unit (acf - actual cubic feet)	20.06
Length of Pig Barrel (ft)	20.00
Inside Diameter of Pig Barrel (in)	13.56
Pressure of Gas Inside the Unit Before Venting (psig)	1160
Atmospheric Pressure (psia)	14.78
Pressure of Gas Inside the Unit Before Venting (psia)	1174.78
Temperature of Gas Inside the Unit Before Venting (°F)	40.00
Temperature of Gas Inside the Unit Before Venting (°R)	499.67
Duration of Each Event (hours/event)	1.00
Frequency of Events (events/year)	1.00
Venting Gas Molecular Weight (lb/lb-mol)	30.65
VOC wt %	4.86
CO ₂ wt%	0.16
CH ₄ wt%	0.52
C ₂ H ₆ wt%	94.46
Are planned vapors (A) uncontrolled; (B) controlled by a flare, vapor combustor, thermal oxidizer, or vapor recovery unit (VRU); or (C) controlled by another type of control device?	(A) uncontrolled

10.73159

Molecular Weight	30.6510
VOC wt %	4.8570
CO ₂ wt %	0.1579
CH ₄ wt %	0.5234
C ₂ H ₆ wt %	94.4616

Planned Emissions		
	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
VOC Results:	6.54	3.27E-03
CO ₂ Results:	0.21	1.06E-04
CH ₄ Results:	0.71	3.53E-04
CO ₂ e Results:	17.84	0.01
C ₂ H ₆ Results:	127.27	0.06

Molecular Weight	30.6510
VOC wt %	4.8570
CO ₂ wt %	0.1579
CH ₄ wt %	0.5234
C ₂ H ₆ wt %	94.4616

Shell Pipeline Company LP
Houston Custody Transfer Meter Station
FL-1 Hourly

Flare Feed Rates and Composition ^{a,b}				Flare DRE% (%)	Flare Exhaust Components ^c (lb/hr)	Criteria Pollutant Emissions ^d
Component	Pilot (lb/hr)	Ethane (lb/hr)	Total (lb/hr)			
Methane	—	20.78	20.78	99%	0.21	NO _x factor: 0.0641 lb/MMBtu
Ethane	—	3,750.82	3,750.82	99%	37.51	CO factor: 0.5496 lb/MMBtu
Propane	5.81	57.12	62.93	98%	1.26	PM ₁₀ factor: 7.60 lb/MMscf
Isobutane	—	37.65	37.65	98%	0.75	PM _{2.5} factor: 7.60 lb/MMscf
n-Butane	—	37.65	37.65	98%	0.75	
Isopentane	—	18.69	18.69	98%	0.37	
n-Pentane	—	18.69	18.69	98%	0.37	NO _x emissions from flare: 5.67 lb/hr
n-Hexane	—	17.86	17.86	98%	0.36	CO emissions from flare: 48.64 lb/hr
n-Heptane	—	5.19	5.19	98%	0.10	SO _x emissions from flare: — lb/hr
Carbon Dioxide	—	6.27	6.27	0%	6.27	PM ₁₀ emissions from flare: 0.66 lb/hr
Oxygen	—	—	—	0%	—	PM _{2.5} emissions from flare: 0.66 lb/hr
						H ₂ S emissions from flare: — lb/hr
GHG Pollutant Emissions						
						GHG CO ₂ Factor ^a : 116.98 lb/MMBTU
						GHG N ₂ O Factor ^a : 2.20E-04 lb/MMBTU
						GWP CO ₂ Equivalent: 1
						GWP CH ₄ Equivalent: 25
						GWP N ₂ O Equivalent: 298
						CO ₂ emissions: 10,359.37 lb/hr
						CH ₄ emissions: 0.21 lb/hr
						N ₂ O emissions ^a : 0.02 lb/hr
						CO ₂ e emissions: 10,370.37 lb/hr
Total	5.81	3,970.73	3,976.54	—	47.96	
Total VOC	5.81	192.86	198.67	—	3.97	
Total Ethane	—	3,750.82	3,750.82	—	37.51	
Heat Value of Stream (Btu/scf)	2,572.00	1,797.71	1,798.50			
Molecular Weight	44.10	30.65	—			
SO ₂ emissions (lb/hr)	—	—	—			
Volumetric Flow (scf/hr)	50.00	49,160.78	49,210.78			
Heat Release (MMBtu/hr)	0.13	88.38	88.51			

^a Uncontrolled stream properties determined via ProMax.

^b Hourly emissions based on 1 event per year, lasting 24 hours

^c Flare Exhaust (lb/hr) = Total Uncontrolled Emissions (lb/hr) x (100-Flare DRE (%)).

^d Flare CO and NO_x emission factors from TCEQ Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4, low Btu, 'other' flare type. PM and PM_{2.5} emission factors from AP-42, Table 1.4-1 and 1.4-2, July 1998.

^e 40 CFR 98 Subpart C, Table C-1 and C-2. Emission Factor (lb/MMBtu) = Emission factor (kg/MMBtu) * (2.20462 lb/kg)

^f Global Warming Potentials from Table A-1 of Subpart A of Part 98 for Mandatory Greenhouse Gas Reporting.

^g 40 CFR 98.233 (Subpart W), equation W-40. Mass N₂O = (10E-3) x scf x HHV x EF

Shell Pipeline Company LP
Houston Custody Transfer Meter Station
FL-1 Hourly

Sample Calculations

Flare PM emissions were calculated using the following formula:

$$\text{Emissions} = \text{EF} / \text{CF} * \text{THR}$$

where,

Emissions = Flare emissions (lb/hr)
EF = Emission factor (lb/10⁶ scf)
CF = 1020 (Btu/scf) Conversion factor from scf to Btu
THR = Total Heat Release (MMBtu/hr)

NO_x and CO emissions were calculated using the equation below:

$$\text{Emissions} = \text{EF} \times \text{THR}$$

where,

EF = Emission factor (lb/MMBtu)
THR = Total Heat Release (MMBtu/hr)

VOC and speciated (HAP) emissions were calculated using the equation below:

$$\text{Emissions} = \text{MR}_i \times (100\% - \text{DE}_{\text{VOC}})$$

where,

MR = Mass Rate (lb/hr)
DE_{VOC} = VOC destruction efficiency (%)

H₂S emissions were calculated using the equation below:

$$\text{Emissions} = \text{MR}_{\text{H}_2\text{S}} \times (100\% - \text{DE}_{\text{H}_2\text{S}})$$

where,

MR_{H₂S} = Mass Rate of H₂S (lb/hr)
DE_{H₂S} = H₂S destruction efficiency (%)

SO₂ emissions were calculated assuming 100% of the H₂S was converted to SO₂ as shown in the equation below:

$$\text{Emissions} = \text{MR}_{\text{H}_2\text{S}} \times \text{MW}_{\text{SO}_2} / \text{MW}_{\text{H}_2\text{S}}$$

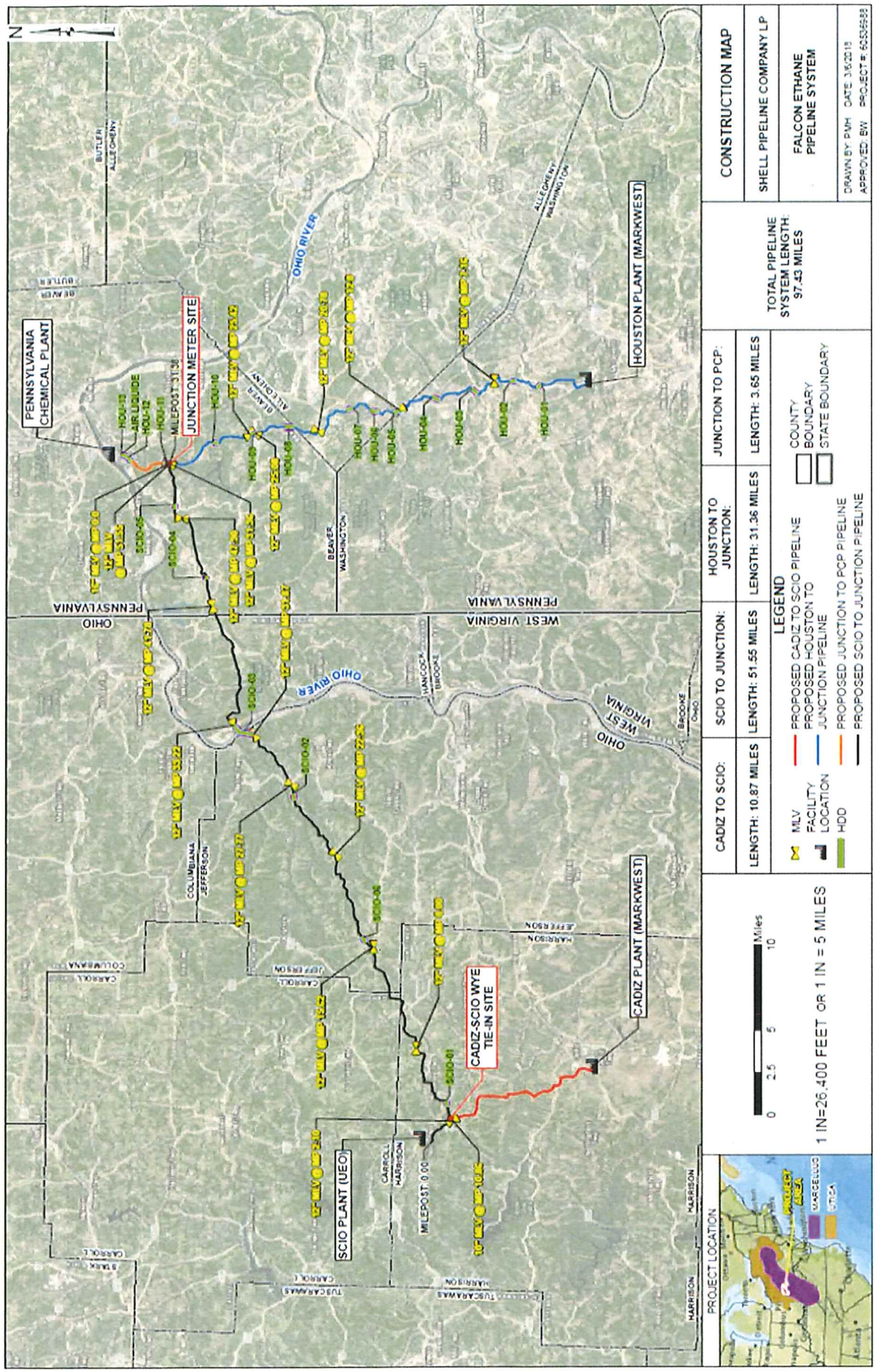
where,

MR_{H₂S} = Mass Rate of H₂S (lb/hr)
MW_{SO₂} = Molecular weight of SO₂ (lb/lbmole)
MW_{H₂S} = Molecular weight of H₂S (lb/lbmole)

[illegible]

40 CFR 98.233 (Subpart W), equation W-49, $\text{Mass N}_2\text{O} = (10\text{E}-3) \times \text{scf} \times \text{HHV} \times \text{EF}$

Figure 1
Area Location Map



CADIZ TO SCIO:		SCIO TO JUNCTION:		HOUSTON TO JUNCTION:		JUNCTION TO PCP:		TOTAL PIPELINE SYSTEM LENGTH: 97.43 MILES	CONSTRUCTION MAP
LENGTH: 10.87 MILES		LENGTH: 51.55 MILES		LENGTH: 31.36 MILES		LENGTH: 3.65 MILES			
MLV FACILITY LOCATION HDD LEGEND PROPOSED CADIZ TO SCIO PIPELINE PROPOSED HOUSTON TO JUNCTION PIPELINE PROPOSED JUNCTION TO PCP PIPELINE PROPOSED SCIO TO JUNCTION PIPELINE COUNTY BOUNDARY STATE BOUNDARY									
SHELL PIPELINE COMPANY LP									
FALCON ETHANE PIPELINE SYSTEM									
DRAWN BY: PMH DATE: 3/5/2018									
APPROVED BY: PROJECT #: 60335588									

Figure 1- Location Map

Falcon Ethane Pipeline

Shell Pipeline Company, LP



Prepared by:

June 2018