45CSR13 NEW SOURCE REVIEW

AIR PERMIT APPLICATION

Sunoco Pipeline Follansbee Station

Brooke County, West Virginia

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ABBREVIATIONS AND ACRONYMS

%	percent
BAT	Best Available Technology
bpd	barrels per day
CAA	Clean Air Act
CAAA	1990 Clean Air Act Amendments
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
CSR	Code of State Rules
DRE	destruction and removal efficiency
the Facility	Sunoco Pipeline Follansbee Station
ft^3	cubic feet
GC	gas chromatograph
GHG	Greenhouse Gas
HAP	hazardous air pollutant
hr	hour
HHV	highest high heating value
lb/day	pounds per day
lb/hr	pounds per hour
L.P.	limited partnership
MACT	Maximum Achievable Control Technology
ME1	Mariner East 1
ME2	Mariner East 2
MHIC	Marcus Hook Industrial Complex
MMBtu/hr	Million British thermal units per hour
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NGL	natural gas liquid
NNSR	Nonattainment New Source Review
NO_x	oxides of nitrogen
NSPS	New Source Performance Standards
NSR	New Source Review
OPP	Ohio Pipeline Project
P&ID	Piping and Instrumentation Diagram
PM	particulate matter
PM_{10}	particles with an aerodynamic diameter less than or equal to 10 micrometers
the Project	Ohio Pipeline Project
PSD	Prevention of Significant Deterioration
PTE	potential-to-emit
QA/QC	quality assurance/quality control
SCADA	supervisory control and data acquisition
scf/hr	standard cubic feet per hour
SIC	Standard Industrial Classification
SO_2	sulfur dioxide
SPLP	Sunoco Pipeline, L.P.
tpy	tons per year
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

wt%	percent by weight
WVDEP	West Virginia Department of Environmental Protection

1 INTRODUCTION

In 2012, Sunoco Pipeline, L.P. (SPLP) announced the "Mariner East" project with the stated intent of transporting petroleum products, such as propane, ethane, and butane, from the Marcellus and Utica Shales from Ohio, West Virginia, and Pennsylvania to the Marcus Hook Industrial Complex ("MHIC"), and various points in between.

The overall goal of the Mariner East project is to ensure that the natural gas liquids (NGLs) production refined from the Marcellus and Utica Shales in Ohio, West Virginia and Pennsylvania will be able to be transported by pipeline within the region as opposed to the Gulf Coast and stored and/or throughput at the MHIC as opposed to terminals on the Gulf Coast—thereby developing the MHIC as a Northeast hub for the distribution of propane, ethane and other NGLs to local, regional, national or international markets.

The initial construction of the Mariner East project, sometimes referred to as "Mariner East 1" (ME1), consisted of an approximately 300-mile pipeline that makes use of SPLP's existing pipeline infrastructure, supplemented by an additional 51-mile extension from Houston, Pennsylvania to Delmont, Pennsylvania, to ship valuable natural energy resources from the Marcellus Shale in Pennsylvania to the MHIC on the Delaware River and SPLP's Twin Oaks facilities operated in conjunction with MHIC.

During and following the 2013-2014 winter season, SPLP experienced a significant increase in shipper demand for intrastate shipments of propane due to an increase in local consumer demand for propane. These changes in market conditions were due to shortages of propane brought about by harsh winter conditions and a deficit of pipeline infrastructure. In reaction to increased shipper interest, SPLP will expand its existing ME 1 service by enlarging the transportation capacity.

This expansion of existing Mariner East service, sometimes referred to as "Mariner East 2" (ME2) will increase the take-away capacity of NGLs from the Marcellus Shale up to 350,000 barrels per day (bpd) and enable SPLP to provide additional on-loading and off-loading points for both intrastate and interstate propane shipments, and increase the amount of propane that would be available for delivery. For the purposes of air permitting, the portion of ME2 within Ohio and West Virginia will be referred to as the Ohio Pipeline Project (OPP, the Project).

The Project involves the phased installation of an up to 20-inch diameter pipeline from Scio, Harrison County, Ohio to Houston, Washington County, Pennsylvania (54 miles). A second, up to 20-inch diameter pipeline, may be installed parallel to the initial line, in the same right-of-way, extending from Follansbee, Brooke County, West Virginia to Houston, Washington County, Pennsylvania (16 miles), within five years.

For the purposes of this permit application, SPLP is proposing to construct and operate and support a maintenance station in Brooke County, West Virginia identified as the Sunoco Pipeline

Follansbee Station (the Facility). The Facility will consist of product meters, control valves, filtration equipment, an enclosed flare, and associated piping and accessory structures. Products (e.g., propane and butane) will flow through the Facility utilizing a single pipeline and interconnected with SPLP's ME2 Pipeline.

The proposed Facility will result in added equipment and components to enhance the transportation of the NGLs through the pipeline, which will generally consist of the following:

- One (1) gas chromatograph (GC);
- One (1) filter;
- One (1) prover;
- One (1) enclosed flare; and
- Miscellaneous fugitive equipment components.

The specific emission sources identified for the proposed Facility will consist of continuous emission sources, maintenance activity emissions, control equipment, fugitive dust emissions, and fugitive sources (e.g., leaks from valves, flanges, and other miscellaneous component types). The vapors associated with the GC, relief valves, and maintenance activities will be captured and diverted to the enclosed flare for control of volatile organic compounds (VOCs). The following table provides a list of these sources:

Table 1-1. Equipment List.

Equipment List	Rating/Size	Quantity
Continuous Emission Sources		
Gas Chromatograph	0.11 scf/hr	1
Relief Valves to Flare Header	0.002 scf/hr	9
Pilot Fuel	22 scf/hr	1
Maintenance Emission Sources		
Filter	49.48 ft^3	1
Prover	5.35 ft^3	1
Control Equipment		
Enclosed Flare	10 MMBtu/hr	1
Propane Tank for Pilot Fuel	1,000 gallons	1
Fugitive Emission Sources		
Various component types and quantities based on engineering design		
Notes: ft^3 = cubic feet; hr = hour; MMBtu = Million British thermal units; scf = standard cubic feet		

The GC, a laboratory piece of equipment used to sample NGLs in the pipeline, will be considered an exempt source in accordance with West Virginia Department of Environmental Protection (WVDEP) §45 Code of State Rule (CSR) 13-2.6, Table 45-13B(26), which specifically exempts equipment used for quality control/assurance or inspection purposes, including sampling

equipment used to withdraw materials for analysis. The GC will be operated on a continuous basis sampling the NGLs in the pipeline for quality assurance control/quality control (QA/QC) purposes. Vapors associated with the analysis of the NGL's will be captured and directed to an enclosed flare for the control of VOCs.

The proposed enclosed flare will be a John Zink Company LLC 4 foot by 30 foot enclosed ZTOF Production Flare with a maximum heat input rating of 10 million British thermal units per hour (MMBtu/hr). The enclosed flare will be used to control VOC emissions associated with the GC and maintenance operations. The design destruction efficiency of the flare is 98 percent (%) based upon the vendor's performance guarantee, which has been applied to estimate potential controlled emissions from the Facility. Intermittent emissions will result from maintenance activities as described in detail in Section 2.1.1. Vapors from these activities will be captured and sent to the proposed enclosed flare. Additional equipment associated with the enclosed flare will consist of an approximate 1,000 gallon propane storage tank, providing fuel for the pilot flame. The propane storage tank is pressurized and would be considered an exempt source in accordance with WVDEP §45CSR13-2.6, Table 45-13B(50), which exempts storage tanks, vessels and containers holding or storing liquid substances that will not emit any regulated air pollutant.

During normal operation of the Facility, emissions will be comprised of the very minor emissions from the GC, pilot fuel, and relief valve valve-seat emissions. However, during the intermittent maintenance activities, uncontrolled potential emissions may exceed the station source permitting threshold of 6 pounds per hour (lb/hr) and 10 tons per year (tpy), of any regulated air pollutant in accordance with WVDEP §45CSR13-2.24b. Accordingly, this application has been submitted to obtain a permit to construct and operate the Facility.

A site location map of the Facility is provided in Attachment B and a process flow diagram is provided in Attachment F. The emission estimates and calculation methodology for the Facility are presented in Attachment N. An analysis of federal and state regulations applicable to the project and a discussion of Best Available Technology (BAT) are presented in Section 3.

2 EMISSION ESTIMATES

2.1 New Emission Sources

The emission sources at the proposed Facility will consist of the continuous vapors captured from the operation of the GC, pilot fuel, and relief valves; vapors captured from maintenance activities that are associated with the filter, prover, and other maintenance activities that may occur; enclosed flare for controlling VOC emissions; fugitive dust emissions from an unpaved access road; and fugitive emissions resulting from leaks from valves, flanges, seals, relief valves, and other miscellaneous component types. The vapors associated with the continuous emissions and maintenance activities will be captured and diverted to the enclosed flare for control of VOC emissions.

2.1.1 Continuous Emission Sources

The potential continuous emission sources for the proposed Facility are the GC, pilot fuel, and relief valve valve-seat emissions. These emissions are being captured and sent to the enclosed flare for the control of VOC emissions into the atmosphere.

A GC is proposed to be installed at the Facility and will operate on a continuous basis performing QA/QC activities on the NGLs transported through the pipeline. The GC will collect samples of the NGLs for analysis and will be vented directly to the flare for control of VOCs. The GCs are considered an exempt source in accordance with WVDEP §45CSR13-2.6, Table 45-13B(26) which specifically exempts equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis. However, the emissions associated with this exempt source were estimated to determine major source applicability.

The pilot fuel will be consumed at a constant rate of 22 standard cubic feet per hour (scf/hr), which will fuel the one pilot light that accompanies the 10 MMBtu/hr enclosed flare.

For the relief valve valve-seat emissions, the calculations were estimated using the leak emission factors for light liquid service presented in the Table 2-3 of United States Environmental Protection Agency (USEPA) report “Protocol for Equipment Leak Emission Estimates”. These emissions are being directed into the flare as opposed to being released into the atmosphere to control VOC emissions.

2.1.2 Maintenance Activity Emission Sources

Emissions associated with maintenance activities for the proposed Facility will generally result from filter maintenance, prover maintenance, and other maintenance activities that may occur, which are directly associated with the operation of the system. The filters are inline devices that prevent foreign objects from entering the pumps. Maintenance of the filters may be performed, which could consist of cleaning or replacing filter screens. Filters are depressurized prior to maintenance and the resulting vapors will be captured and directed to the enclosed flare to control VOC emissions. The prover is a quality QA/QC device used to assure the accuracy of the meters. Maintenance of the provers may be performed, which could consist of a water draw, seal replacement, or other activities. During maintenance of the prover, entrained vapors within the unit will be captured and directed to the enclosed flare to control VOC emissions. The detailed emission calculations are presented in Attachment N.

2.1.3 Enclosed Flare

The proposed Facility will be using a 10 MMBtu/hr enclosed flare to control the VOC emissions captured from the maintenance activities and continuous sources. Propane, supplied by a propane tank that accompanies the 10 MMBtu/hr flare, will be used as pilot gas fuel at a maximum heat input rate of 0.05 MMBtu/hr for the one pilot light. The design-based destruction and removal efficiency (DRE) of the flare is 98%) and in compliance with the applicable requirements specified in 40 Code of Federal Regulations (CFR) 60.18.

The enclosed flare is being designed to comply with the USEPA 40 CFR Part 60.18 and utilizes the performance test specifications in 40 CFR Part 60 Subpart OOOO, paragraph §60.5413(d)(11). The flare will be monitored 24 hours per day, seven days per week via a supervisory control and data acquisition (SCADA) system and a physical inspection will occur at a minimum of once per week. SPLP will install, operate and maintain the enclosed flare in accordance with the manufacturer's guidelines and specifications.

2.1.4 Fugitive Emissions

The proposed Facility will involve the addition of equipment, piping, and components (e.g., valves, flanges, and other miscellaneous component types), which will be potential sources of fugitive VOC emissions as a result of leaks from the sealed surfaces. The quantity of each type of component used to estimate emissions was based on the engineering Piping and Instrumentation Diagrams (P&IDs) for the Facility with a 10% contingency to allow as built changes during construction.

2.1.5 Dust Emissions

Operations at the proposed Facility will produce fugitive dust (i.e., particulate) emissions through vehicle traffic on the unpaved areas as well as from the exempt vaporizer for the butane sphere. In accordance with OAC rule 3745-17-07(B), no visible particulate emissions are allowed to be visible from any unpaved roadway or parking area.

2.2 Calculation Methodology

The emissions associated with the proposed Facility were calculated in accordance with regulatory guidance and are based on the most representative data available. The calculation methodology is presented below for each source; a summary and detailed emission calculations are presented in Attachment N.

Calculations were estimated based on the proposed Facility operating 8,760 hours per year. The NGLs being sent through the system will consist of butane and propane with anticipated flow through rates of 17,000 BPD and 35,500 BPD respectively. Based on a representative analysis of each NGL; the butane product consists of 100% by weight (wt%) VOCs and the propane product has an estimated VOC content of 98.6 wt%. In order to conservatively estimate the potential-to-emit (PTE) for the proposed Facility, the worst case emission rate per pollutant per product was utilized. These emission rates were applied to each pollutant based on the various physical properties of the products (i.e., heating value, gas density, etc.).

The continuous emissions are based on the emissions from the GC, pilot fuel, and the relief valves that are being captured and directed to the enclosed flare. Emissions from the GC were given by the manufacturer at 0.11 scf/hr and the pilot fuel is being consumed at 22 scf/hr. The emissions associated with the relief valve valve-seats estimated using the leak emission factors for light liquid service presented in the Table 2-3 of USEPA report "Protocol for Equipment Leak Emission

Estimates" and a representative NGL analysis. Relief valve emissions are continuously captured and sent to the enclosed flare through the flare header piping.

The emissions associated with maintenance activities are based on the estimated annual vented emissions being sent to the enclosed flare as a result of anticipated maintenance activities (filter maintenance, prover maintenance, etc.). The anticipated maintenance operations include: annual prover maintenance that may consist of performing a water draw, seal replacement, or other maintenance activities and filter maintenance which may include cleaning or replacement of filter screens which is estimated to occur four (4) times during the first year and once per year beyond the first year. Based on the proposed maintenance operations and to account for other miscellaneous routine maintenance activities, annual emissions were conservatively estimated assuming two (2) prover maintenance events and six (6) filter maintenance activities per year. Emissions associated with these activities will be routed to the enclosed flare.

The 10 MMBtu/hr enclosed flare is proposed to control the VOC emissions from the vented NGLs associated with the relief valves and maintenance activities. Propane will be used as pilot gas fuel at a maximum heat input rate of 0.05 MMBtu/hr. The combustion emissions estimated from the operation of the flare combusting the NGL vapors and the pilot gas consist of oxides of nitrogen (NO_x), carbon monoxide (CO), VOCs, hazardous air pollutants (HAPs), sulfur dioxide (SO_2), and Greenhouse Gases (GHGs). The NO_x and CO emissions were estimated based on emission factors presented in USEPA's AP-42 Section 13.5. VOC emissions resulting from the control of the NGL vapors were estimated based on a 98% DRE. For estimating the impact to the PTE for the flare, the continuous emissions and the maintenance activities were used.

The proposed Facility will involve the installation of equipment, piping, and components (e.g., valves and flanges), which will be potential sources of fugitive VOC emissions as a result of leaks from the sealed surfaces. Potential emissions were quantified based on the proposed new equipment and piping components estimated counts from the engineering design, a 10% item count contingency, and the best available emission factors for fugitive emissions from NGL operations. The fugitive emission calculations were estimated using the leak emission factors for light liquid service presented in the Table 2-3 of USEPA report "Protocol for Equipment Leak Emission Estimates" and a representative NGL analysis.

Based on the calculation methodology presented above, the potential short-term hourly and annual emission rates for the Facility are presented in Attachment N.

2.3 Potential Emission

Based on the calculation methodology presented in this section, the uncontrolled/controlled short term hourly emission rates and the uncontrolled/controlled potential annual emission for the proposed Facility are presented in Tables 2-1 through 2-4 and detailed in the emission calculations in Attachment N. The short term maximum hourly emission rates are based on the maximum rate of the captured vapors able to be processed through the enclosed flare consisting of the continuous flow from the continuous emissions (GC, pilot fuel, and relief valves) and the

release of NGLs during a maintenance event. The potential annual emissions are based on the continuous emission sources operating 8,760 hours per year, six filter cleanings per year and two maintenance activities on the prover. The emissions were also estimated assuming propane due to its lower density which would provide a conservative estimate by producing a greater volume than butane at atmospheric conditions. Butane was used for calculating combustion since it is 100% VOCs and has the highest high heating value (HHV).

Table 2-1. Uncontrolled Maximum Short Term Emission Summary.

Emission Source	Uncontrolled Potential Emissions (lb/hr)							
	PM	PM_{10}	NO_X	CO	VOC	SO_2	HAP	GHG (CO_2e)
Flare[1]								
Continuous Gas Stream	N/A	N/A	N/A	N/A	1.96E-02	N/A	N/A	N/A
Maintenance Gas Stream	N/A	N/A	N/A	N/A	4.73E+02	N/A	N/A	N/A
Pilot Flame	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal Flare	**N/A**	**N/A**	**N/A**	**N/A**	**472.71**	**N/A**	**N/A**	**N/A**
Fugitives								
Equipment	N/A	N/A	N/A	N/A	0.04	N/A	N/A	N/A
Haul Road (Controlled)	0.34	0.15	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	**0.34**	**0.15**	**N/A**	**N/A**	**472.75**	**N/A**	**N/A**	**N/A**

[1] Smokeless flares have no measurable particulate emissions pursuant to AP-42, Section 13.5, Table 13.5-1

CO = carbon monoxide
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas
HAP = hazardous air pollutant
lb/hr = pounds per hour
N/A = not applicable
NO_X = oxides of nitrogen
PM = particulate matter
PM_{10} = particles with an aerodynamic diameter less than or equal to 10 micrometers
$PM_{2.5}$ = particles with an aerodynamic diameter less than or equal to 2.5 micrometers SO_2 = sulfur dioxide
VOC = volatile organic compound

Table 2-2. Uncontrolled Annual Emission Summary.

Emission Source	Uncontrolled Potential Emissions (tpy)							
	PM	PM_{10}	NO_X	CO	VOC	SO_2	HAP	GHG (CO_2e)
Flare[1]								
Continuous Gas Stream	N/A	N/A	N/A	N/A	8.58E-02	N/A	N/A	N/A
Maintenance Gas Stream	N/A	N/A	N/A	N/A	6.72E+00	N/A	N/A	N/A
Pilot Flame	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal Flare	**N/A**	**N/A**	**N/A**	**N/A**	**6.81**	**N/A**	**N/A**	**N/A**
Fugitives								
Equipment	N/A	N/A	N/A	N/A	0.19	N/A	N/A	N/A
Haul Road (Controlled)	1.51	0.68	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	**1.51**	**0.68**	**N/A**	**N/A**	**7.00**	**N/A**	**N/A**	**N/A**

[1] Smokeless flares have no measurable particulate emissions pursuant to AP-42, Section 13.5, Table 13.5-1

CO = carbon monoxide
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas
HAP = hazardous air pollutant
lb/hr = pounds per hour
N/A = not applicable
NO_X = oxides of nitrogen
PM = particulate matter
PM_{10} = particles with an aerodynamic diameter less than or equal to 10 micrometers
$PM_{2.5}$ = particles with an aerodynamic diameter less than or equal to 2.5 micrometers SO_2 = sulfur dioxide
VOC = volatile organic compound

Table 2-3. Controlled Maximum Short Term Emission Summary.

Emission Source	Controlled Potential Emissions (lb/hr)							
	PM	PM_{10}	NO_X	CO	VOC	SO_2	HAP	GHG (CO_2e)
Flare[1]								
Continuous Gas Stream	N/A	N/A	2.82E-05	1.28E-04	3.92E-04	1.18E-06	0.00E+00	5.95E-02
Maintenance Gas Stream	N/A	N/A	6.80E-01	3.10E+00	9.45E+00	2.84E-02	0.00E+00	1.44E+03
Pilot Flame	N/A	N/A	3.40E-03	1.55E-02	2.85E-02	4.69E-04	3.75E-05	6.82E+00
Subtotal Flare	**N/A**	**N/A**	**0.68**	**3.12**	**9.48**	**0.03**	**0.00004**	**1,442.9**
Fugitives								
Equipment	N/A	N/A	N/A	N/A	0.04	N/A	N/A	N/A
Haul Road (Controlled)	0.14	0.06	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	**0.14**	**0.06**	**0.68**	**3.12**	**9.53**	**0.03**	**0.00004**	**1,442.9**

[1] Smokeless flares have no measurable particulate emissions pursuant to AP-42, Section 13.5, Table 13.5-1

CO = carbon monoxide
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas
HAP = hazardous air pollutant
lb/hr = pounds per hour
N/A = not applicable
NO_X = oxides of nitrogen
PM = particulate matter
PM_{10} = particles with an aerodynamic diameter less than or equal to 10 micrometers
$PM_{2.5}$ = particles with an aerodynamic diameter less than or equal to 2.5 micrometers SO_2 = sulfur dioxide
VOC = volatile organic compound

Table 2-4. Controlled Annual Emission Summary.

Emission Source	Controlled Potential Emissions (tpy)							
	PM	PM_{10}	NO_X	CO	VOC	SO_2	HAP	GHG (CO_2e)
Flare[1]								
Continuous Gas Stream	N/A	N/A	1.23E-04	5.63E-04	1.72E-03	5.15E-06	0.00E+00	2.61E-01
Maintenance Gas Stream	N/A	N/A	9.67E-03	4.41E-02	1.34E-01	4.03E-04	0.00E+00	2.04E+01
Pilot Flame	N/A	N/A	1.49E-02	6.79E-02	1.25E-01	2.06E-03	1.64E-04	2.99E+01
Subtotal Flare	**N/A**	**N/A**	**0.02**	**0.11**	**0.26**	**0.002**	**0.0002**	**50.5**
Fugitives								
Equipment	N/A	N/A	N/A	N/A	0.19	N/A	N/A	N/A
Haul Road (Controlled)	0.60	0.27	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	**0.60**	**0.27**	**0.02**	**0.11**	**0.45**	**0.002**	**0.0002**	**50.5**

[1] Smokeless flares have no measurable particulate emissions pursuant to AP-42, Section 13.5, Table 13.5-1

CO = carbon monoxide
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas
HAP = hazardous air pollutant
lb/hr = pounds per hour
N/A = not applicable
NO_X = oxides of nitrogen
PM = particulate matter
PM_{10} = particles with an aerodynamic diameter less than or equal to 10 micrometers
$PM_{2.5}$ = particles with an aerodynamic diameter less than or equal to 2.5 micrometers SO_2 = sulfur dioxide
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3 REGULATORY REVIEW AND APPLICABILITY

3.1 New Source Review

Separate preconstruction review procedures have been established for projects proposed in designated attainment areas (areas in which air quality is better than the National Ambient Air Quality Standards [NAAQS]) and nonattainment areas (areas in which air quality is worse than NAAQS) under the Clean Air Act (CAA) New Source Review (NSR) program. The preconstruction review process for new or modified major sources located in areas designated as attainment or unclassifiable is performed under the Prevention of Significant Deterioration (PSD) program. The PSD permitting process is intended to keep new air emission sources from causing existing air quality in attainment areas to deteriorate beyond acceptable levels. The preconstruction review process for new or modified major sources located in nonattainment areas is performed under the Nonattainment New Source Review (NNSR) program. NNSR only applies to pollutants that are classified as nonattainment. Therefore, a new facility can undergo both types of review, depending on the total emissions of each pollutant and the regional air quality attainment status. Brooke County, WV, is classified as in attainment or unclassified for all criteria pollutants with the exception of SO_2 where the Cross Creek Tax District portion of the county is designated as nonattainment for SO_2. However, the Facility is not located in the Cross Creek Tax District portion of Brooke County and therefore, NNSR does not apply to this Facility.

The major source threshold under PSD depends upon the type of facility. A facility is considered major under PSD if it emits or has the potential to emit any criteria pollutant greater than 100 tpy if it belongs to one of the 28 categories of stationary sources listed under 40 CFR 52.21 (b)(1)(i). The PSD major source threshold for all other source categories is 250 tpy. The Facility is not one of the named 28 source categories and therefore, the applicable major source PSD threshold is 250 tpy. As documented in Table 2-2 and Table 2-4, the Facility's potential emissions are well below the applicable PSD threshold.

3.2 New Source Performance Standards

USEPA has established New Source Performance Standards (NSPS) at 40 CFR 60 that regulate air pollutant emissions from certain categories of stationary sources. For combustion sources, emission standards typically are expressed in terms of mass emissions per unit of fuel combusted, fuel quality, or exhaust gas concentration. Sources subject to a specific NSPS category are also subject to the general rules in 40 CFR 60, Subpart A. Applicability of the source categories under 40 CFR 60 is discussed below for emission units included in the Facility.

- 40 CFR 60, Subpart Kb applies to storage vessels with a capacity greater than or equal to 75 cubic meters that is used to store volatile organic liquids for which construction, reconstruction, or modification is commenced after July 23, 1984. A propane storage tank will be located at the injection station to supply fuel for the pilot flame of the enclosed flare. However, the tank is sized to be approximately 1,000 gallons, which is less than 75 cubic meters (19,813 gallons), and is therefore exempt in accordance with 40 CFR 60.110b(a) of this subpart.
- 40 CFR 60, Subpart OOOO applies to certain types of natural gas and crude oil processing equipment, generally associated with processing of natural gas prior to transfer of custody to a gas transmission system. The Facility is part of the natural gas liquids transmission system and is not considered an affected facility under Subpart OOOO; therefore, Subpart OOOO does not apply to the proposed Facility.

3.3 National Emission Standards for Hazardous Air Pollutants

The National Emissions Standards for Hazardous Air Pollutants (NESHAP), codified in 40 CFR Parts 61 and 63, regulate HAP emissions. Part 61 was promulgated prior to the 1990 Clean Air Act Amendments (CAAA) and regulates only eight types of hazardous substances (asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride). The Facility is not in one of the source categories regulated by Part 61; therefore, the requirements of Part 61 are not applicable.

The 1990 CAAA established an initial list of 189 HAPs, resulting in the promulgation of Part 63. Part 63, also known as the Maximum Achievable Control Technology (MACT) standards, regulates HAP emissions from both major sources of HAP emissions and non-major (area) sources of HAP emissions within specific source categories. The Facility is not a subject source under any MACT standards and therefore, 40 CFR 63 is not applicable to the proposed Facility.

3.4 Source Aggregation

Single source determinations arise when a company operates an air contamination source on-site or adjacent to another air contamination source. Emissions from these sources should be aggregated as a single source to evaluate source status with regard to permitting requirements under the PSD, NSR, and Title V programs. If the emissions from the aggregated sources meet or exceed a major source emission threshold under one of these permitting programs, then the aggregated source must obtain a major source permit under that program.

The proposed Facility will be independently situated along the Sunoco Pipeline and does not share any of the following with another facility: (1) have the same two-digit, i.e., major industry grouping, Standard Industrial Classification (SIC) code; (2) are co-located, i.e., they are located on adjacent or contiguous properties; and (3) are under common control. Each element must exist to be deemed a single source and none of the above apply to the Facility; therefore, source aggregation is not applicable to the Facility. Furthermore, Sunoco does not own or operate any other facilities in West Virginia.

3.5 Title V Major Source Operating Permit Program

The Title V permit program under §45CSR30 of the WVDEP regulations requires major sources to obtain Title V operating permits. The major source thresholds under the Title V program in West Virginia are 100 tpy of any criteria air pollutant; 10 tpy of any single HAP; and 25 tpy of total HAPs. The authority to issue Title V operating permits has been delegated by USEPA to WVDEP.

As summarized in Tables 2-1 through 2-4, the Facility will not be a major Title V source and the Title V permit program under §45CSR30 will not apply.

3.6 Accidental Release Prevention and Risk Management

USEPA has established accidental release prevention and risk management plan requirements as part of 40 CFR Part 68 (Chemical Accident Prevention Provisions). Part 68 lists regulated substances along with thresholds for determining the applicability of the associated requirements. If a regulated substance is handled, stored, or processed in greater than threshold quantities at a stationary source, then a risk management plan must be prepared.

Even if a facility is not required to prepare a risk management plan, requirements of the General Duty Clause in Section 112(r) of the CAA still apply if the facility produces, processes, handles, or stores regulated substances or other extremely hazardous substances on site. Compliance with the General Duty Clause requires that owners of facilities be continuously vigilant about potential hazards and methods of minimizing the consequences of accidental releases.

The proposed Facility is not expected to produce, process, handle, or store any substance regulated under Part 68 in quantities exceeding applicability thresholds. The propane from the liquefied petroleum gas tank will be used as fuel for the flare and is therefore exempt from the requirements of Part 68.

3.7 West Virginia State Requirements

As documented in Tables 2-1 through 2-4 above, the Facility will be a minor source of emissions under the NSR Program as well as the Title V Operating Permit program under §45CSR30. However, the potential uncontrolled emissions for the Facility will exceed the permitting threshold of 6 lb/hr and/or 144 pounds per day (lb/day) in accordance with WVDEP §45CSR13-2.24. Accordingly, Sunoco is submitting this application for a minor source permit to install and operate.

In addition to regulations already discussed in preceding sections, state regulations that pertain to this Facility are listed in Table 3-2. Titles shown in capital letters in the table are permits, notifications, and/or reports that will be needed for construction and operation of the Facility.

Federal authority is delegated to the State of West Virginia, and all permit applications will be submitted to WVDEP. As explained in preceding sections, the following list of air permits is applicable to the proposed facility:

Table 3-1 West Virginia DEP Applicable Regulations

Rule	Description
45CSR02	Control of visible and particulate emissions from stationary sources
45CSR08	Ambient Air Quality Standards
45CSR10	General emission limit provisions for sulfur dioxide
45CSR11	Prevention Of Air Pollution Emergency Episodes
45CSR13	Permits-to-Install New Sources and Permit-to-Install and Operate Program
45CSR17	Restrictions of emissions of fugitive dust
45CSR21	Control of emissions of VOCs from stationary sources

3.7.1 Permit Applicability

Air pollution control regulations have been established by the WVDEP for air emissions associated with stationary sources. The stationary sources of emissions at the proposed Facility will be a GC; maintenance activities; and fugitive emissions resulting from leaks from valves, flanges, seals, relief valves, and other miscellaneous component types. The vapors associated with the GC and maintenance activities will be captured and diverted to an enclosed flare for control of VOC emissions. As previously discussed the GC will be considered an exempt source in accordance with §45CSR13-2.6, Table 45-13B(26); however, the emissions from the GC were estimated as part of the PTE for the proposed Facility to determine major source applicability.

To determine permit applicability for the Facility's emission sources, the PTE emissions have been estimated as detailed in Section 2 and presented in Attachment B. Based on the PTE emission estimates presented in Table 2-1, Table 2-2, and as detailed in Attachment B, the

proposed Facility will be considered a minor source with potential uncontrolled VOC emissions in excess of 6 lb/hr but less than major source thresholds. Therefore, the Facility will need to obtain a permit to construct and operate.

4 REFERENCES

United States Environmental Protection Agency (USEPA), 1995. Protocol for Equipment Leak Emission Estimates. EPA-453/R-95-017, Table 2-3, November, 1995.

USEPA, 2006. AP-42. Compilation of Air Pollution Emission Factors, Volume I: Stationary Point and Area Sources, Section 13.2.2, Unpaved Roads, Fifth Edition, revised November 9, 2006.

USEPA, 2009. Title 40 Code of Federal Regulations Parts 51 and 52, Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR): Aggregation and Project Netting. Federal Register Volume 74, No. 10, January 15, 2009, pages 2376-2383.

USEPA, 2015a. AP-42. Compilation of Air Pollution Emission Factors, Volume I: Stationary Point and Area Sources, Section 13.5, Industrial Flares, Tables 13.5-1 and 13.5-2, Fifth Edition, April, 2015.

USEPA, 2015b. Title 40 Code of Federal Regulations, Part 98, Subpart C. - Mandatory Greenhouse Gas Reporting, Appendix, Tables C-1 and C-2. November, 2015.

5 PERMIT APPLICATION

Included with this permit application package are the forms required in accordance with §45CSR13 and WVDEP guidance. The supporting information associated with this permit application package includes the following:

- Application for NSR Permit (Minor Source)
- Attachment A – Business Certificate
- Attachment B – Site Map
- Attachment C – Installation and Startup Schedule
- Attachment D – Regulatory Discussion – N/A (See Section 3)
- Attachment E – Plot Plan
- Attachment F – Process Flow Diagram(s)
- Attachment G – Process Description – N/A (See Section 2)
- Attachment H – Material Safety Data Sheets (MSDS)
- Attachment I – Emission Units Table
- Attachment J – Emission Points Data Summary Sheet
- Attachment K – Fugitive Emissions Data Summary Sheet
- Attachment L – Emissions Unit Data Sheets
- Attachment M – Air Pollution Control Device Sheets
- Attachment N – Supporting Emissions Calculations

- Attachment O – Monitoring/Recordkeeping/Reporting/Testing Plans
- Attachment P – Public Notice
- Attachment Q – Business Confidential Claim – N/A
- Attachment R – Authority Forms
- Attachment S – Title V Revision – N/A (See Section 3)
- Application Fee

NSR (45CSR13) APPLICATION FORM

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

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

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

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

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

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

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

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

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

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Sunoco Pipeline, L.P.

2. Federal Employer ID No. ***(FEIN):***
2 3 3 1 0 2 6 5 6

3. Name of facility *(if different from above):*
Sunoco Pipeline Follansbee Station

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

5A. Applicant's mailing address:
535 Fritztown Road

Sinking Spring, PA 19608

5B. Facility's present physical address:
376 White Tail Ridge Rd. Wellsburg, WV 26070
Latitude 40° 14' 8.3364"N, Longitude 80° 32' 36.5922"W Brooke County, WV

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

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

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: Sunoco Logistics, L.P.

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

- If **YES,** please explain: The applicant owns and controls the facility.
- If **NO,** you are not eligible for a permit for this source.

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

10. North American Industry Classification System **(NAICS)** code for the facility:
493190, 23

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

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

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

12A.

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

Directions from WV-88: Turn off of WV-88 onto Mc Adoo Ridge Road (1.6 miles). Turn left toward Whitetail Ridge (243 ft). Continue onto Whitetail Ridge (240 ft). Take a slight right (0.4 miles) and continue staying right until you reach the Follansbee Station.

12.B. New site address (if applicable):	12C. Nearest city or town: Wellsburg, WV	12D. County: Brooke
12.E. UTM Northing (KM): 4454012	12F. UTM Easting (KM): 538832	12G. UTM Zone: 17T

13. Briefly describe the proposed change(s) at the facility:
N/A

14A. Provide the date of anticipated installation or change: 11/2015 – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: 09/29/2016

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

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

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

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

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

Section II. Additional attachments and supporting documents.

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

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

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

– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence). House located at 977'NE. 0.2mi

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

23. Provide a **Process Description** as **Attachment G.**

– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

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

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

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

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

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

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

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

☐ Bulk Liquid Transfer Operations	☒ Haul Road Emissions	☐ Quarry
☒ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	
☐ General Emission Unit, specify		

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

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

☐ Absorption Systems	☐ Baghouse	☒ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ Other Collectors, specify

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

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

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

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

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

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

☐ **YES** ☒ **NO**

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

Section III. Certification of Information

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

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

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

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

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

Certification of Truth, Accuracy, and Completeness

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

Compliance Certification

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

SIGNATURE _____ *(Please use blue ink)* DATE: 11/25/2015 *(Please use blue ink)*

35B. Printed name of signee: Matthew L. Gordon		35C. Title: Principle Engineer
35D. E-mail: mlgordon@sunocologistics.com	36E. Phone: 610-670-3284	36F. FAX:
36A. Printed name of contact person (if different from above): Christopher Embry		36B. Title: Sr. Environmental Engineer
36C. E-mail: CPEMBRY@sunocologistics.com	36D. Phone: 610-670-3237	36E. FAX: 866-599-4936

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

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

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

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

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

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

Attachment A: Business Certificate

STATE OF WEST VIRGINIA
State Tax Department, Revenue Division
P. O. Box 2666
Charleston, WV 25330-2666

Earl Ray Tomblin, Governor **Mark W. Matkovich, Acting Tax Commissioner**

SUNOCO PIPELINE L.P.
1735 MARKET ST FL 13
PHILADELPHIA PA 19103-7505

Letter Id: L1576691776
Issued: 11/14/2013
Account #: 2290-4360

RE: Business Registration Certificate

The West Virginia State Tax Department would like to thank you for registering your business. Enclosed is your Business Registration Certificate. This certificate shall be permanent until cessation of business or until suspended, revoked or cancelled. Changes in name, ownership or location are considered a cessation of business; a new Business Registration Certificate and applicable fees are required. Please review the certificate for accuracy.

This certificate must be prominently displayed at the location for which issued. Engaging in business without conspicuously posting a West Virginia Business Registration Certificate in the place of business is a crime and may subject you to fines per W.Va. Code § 11-9.

When contacting the State Tax Department, refer to the appropriate account number listed on the back of this page. The taxes listed may not be all the taxes for which you are responsible. Account numbers for taxes are printed on the tax returns mailed by the State Tax Department. Failure to timely file tax returns may result in penalties for late filing.

Should the nature of your business activity or business ownership change, your liability for these and other taxes will change accordingly.

To learn more about these taxes and the services offered by the West Virginia State Tax Department, visit our web site at www.wvtax.gov.

Enclosure

atL.006 v.4

Save a stamp and your time. You can now view, file and pay taxes at https://mytaxes.wvtax.gov
More taxes will be available for online access in the future.

TAX	FILING FREQUENCY	ACCOUNT NUMBER
Business Registration Tax		2290-4360
Pass Through Entity Tax	Partnership Annual	2289-6850

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
SUNOCO PIPELINE L.P.
1735 MARKET ST 13
PHILADELPHIA, PA 19103-7505

BUSINESS REGISTRATION ACCOUNT NUMBER: **2290-4360**

This certificate is issued on: 11/14/2013

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

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

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

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

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

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

atL006 v.4
L1576691776

Attachment B: Site Map

TETRA TECH

WWW.TETRATECH.COM

661 ANDERSEN DRIVE – FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

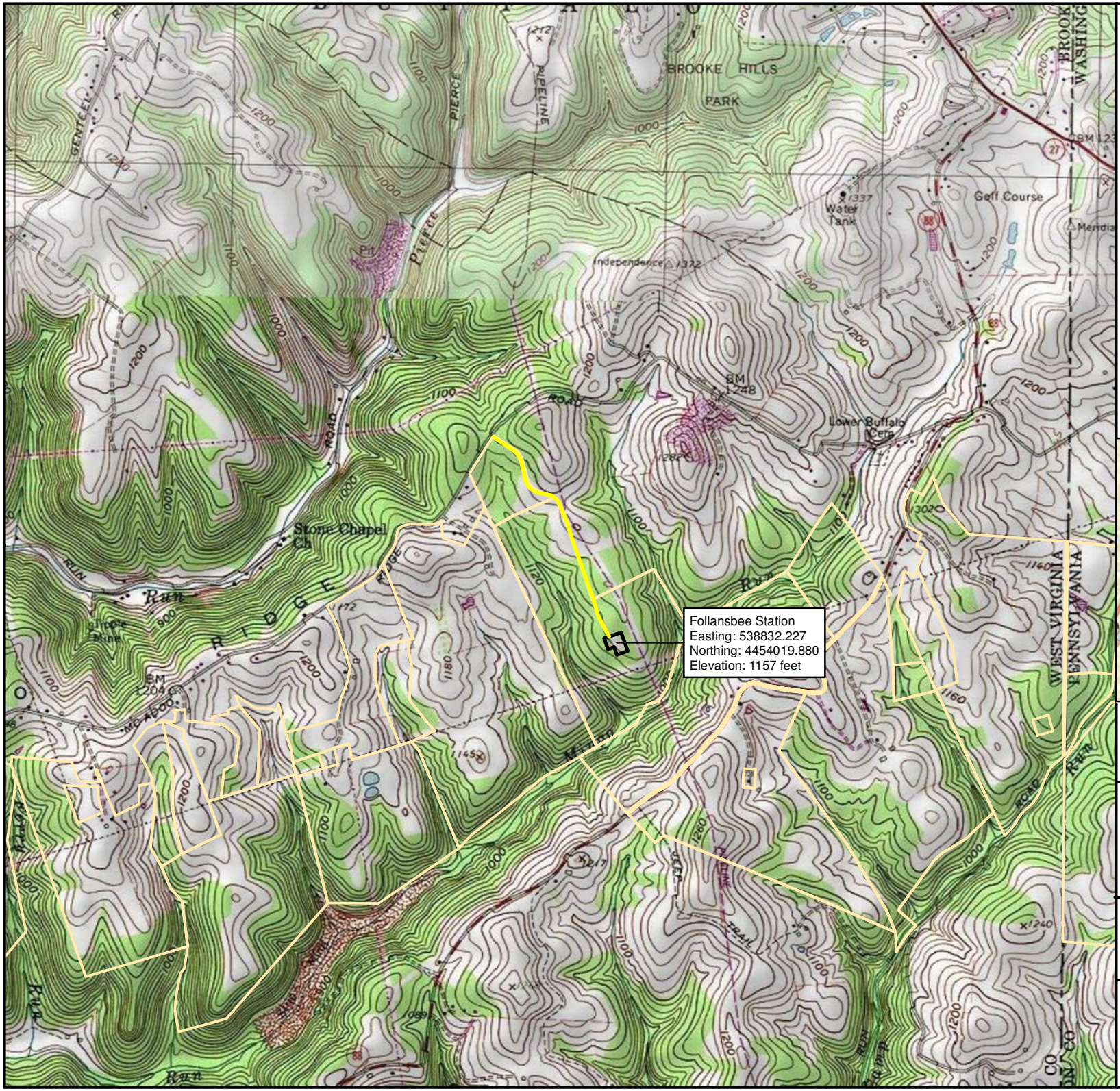
SUNOCO PIPLINE L.P.
BROOKE COUNTY, WEST VIRGINIA

SITE LOCATION MAP
OHIO PIPELINE PROJECT
FOLLANSBEE STATION

DATE:	9/25/15
PROJECT NO.:	112IC05958
DESIGNED BY:	MS
DRAWN BY:	NN
CHECKED BY:	TD
SHEET: 1 OF 1	

FIGURE 1

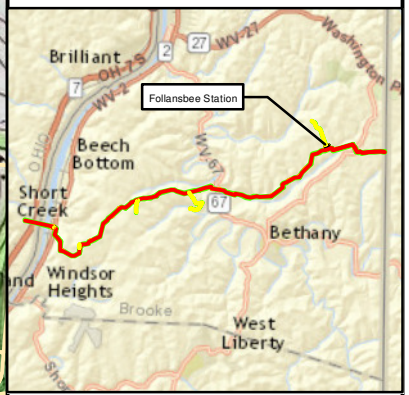
R:_Marcellus Shale Projects\Sunoco\5958 – Air Permits\Figures\Follansbee – Figure 1.dwg PIT NICHOLE.NAJESKI 10/5/2015 9:56:17 AM



Legend

- Block Valve Site Layout
- Access Road
- Parcel

Sheet Identifier



N

Feet
0 1,000 2,000

Meters
0 304.8 609.6

ATTACHMENT B
USGS PROJECT LOCATION MAP
OHIO PIPELINE PROJECT
FOLLANSBEE STATION
SUNOCO LOGISTICS, L.P.
BROOKE COUNTY, WV

TETRA TECH

Notes:
1) Topographic map provided by ESRI's ArcGIS Online USA Topo Maps map service (© 2013 National Geographic Society, i-cubed).
2) Quadrangles displayed are Bethany and Steubenville East.
3) Coordinate are in NAD 1983 UTN 17N (meters).

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\OHIOPIPELINE_FOLLANSBEESTATION_USGS.MXD 12/03/15 GIS

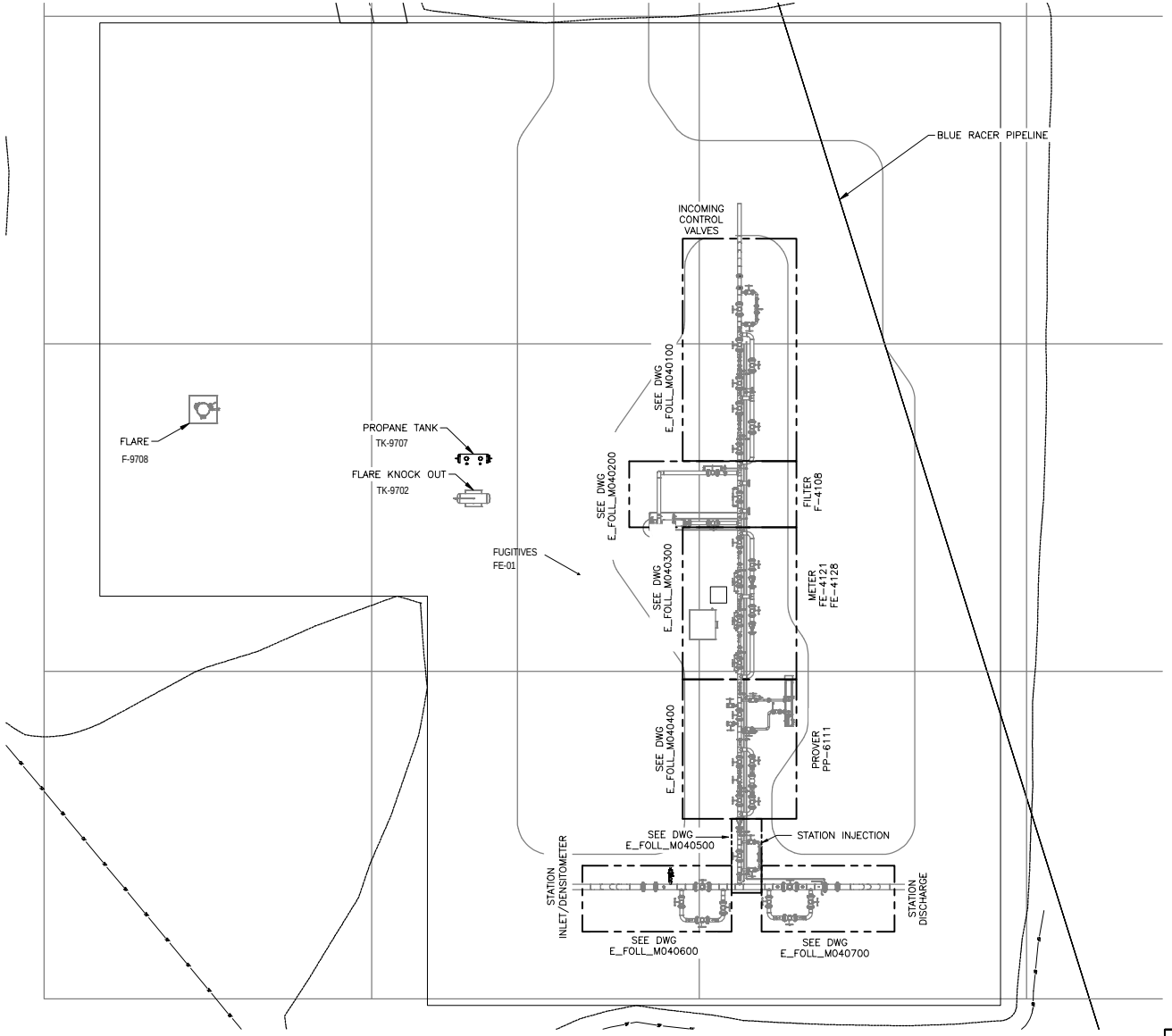
Attachment C: Installation and Startup Schedule

ATTACHMENT C: INSTALLATION AND START UP SCHEDULE

Unit	Approximate Start of Installation	Approximate Start of Operations
FE-01 (Fugitive Emissions)	11/2015	9/29/2016
TK-9702 (Flare Knockout Tank)	11/2015	9/29/2016
TK-9707 (Propane Tank)	11/2015	9/29/2016

Attachment D: Regulatory Discussion – N/A (See Section 3)

Attachment E: Plot Plan



PLAN
SCALE 1/16" = 1'-0"

PLANT TRUE
17°55'
N
16' 8' 0' 16' 32'

REV.	DATE	APP#	DESCRIPTION	APPROVAL
A	06/24/15	384432307	ISSUED FOR REVIEW	DFA FK ZBB

ENGINEERING RECORD		
DRAWN BY	D.AMATO	
CHECKED BY	F.KAY	
APPROVED BY	Z.BAUER	
DATE	2015-06-15	
SCALE	AS SHOWN	36" X 24"
REI PROJECT #	02959	

TETRA TECH ROONEY
(303) 792-5911

Sunoco Logistics Partners L.P.

ATTACHMENT E
DETAILED PLOT PLAN
OHIO PIPELINE PROJECT
FOLLANSBEE STATION
SUNOCO PIPELINE, L.P.
BROOKE COUNTY, WV

WELLSBURG BROOKE, WV

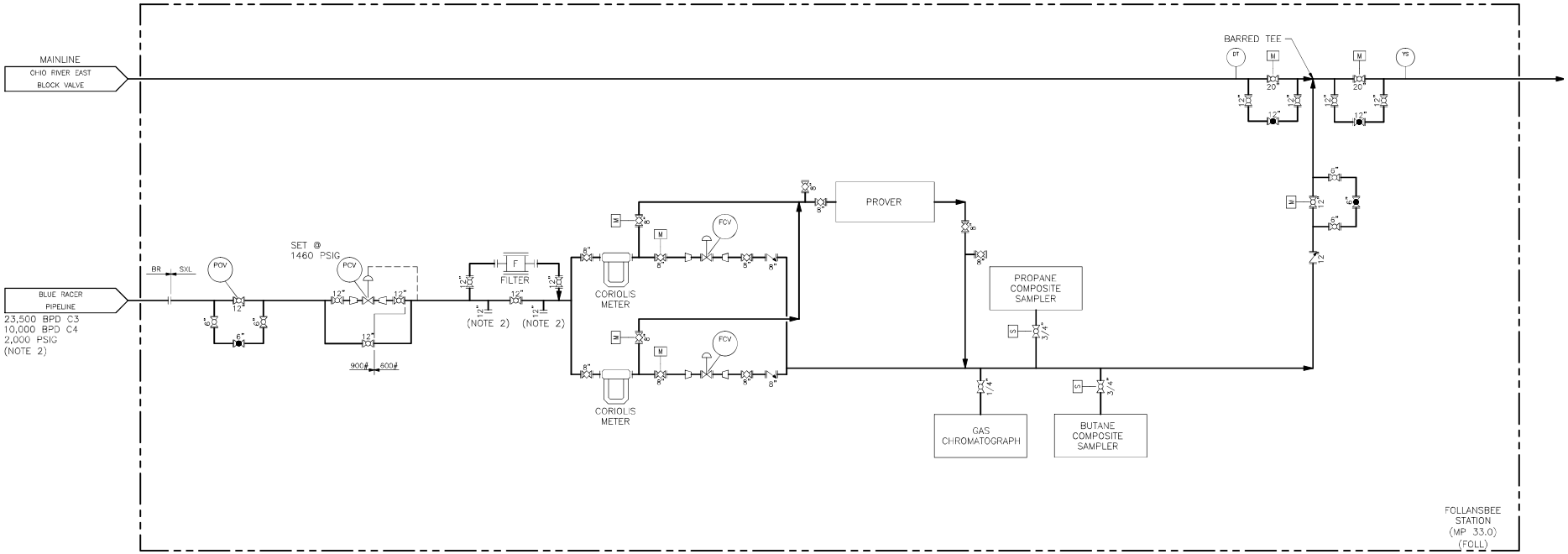
OLD DRAWING NO.

DWG. NO. E_FOLL_M100002

REV. NO. A

C:\pwworking\wh\dms08548\E_FOLL_M100002.dwg dsmon.amato Mon, 06/29/15 8:13 AM

Attachment F: Process Flow Diagram



NOTES:
1. DESIGN BASIS FOR ALL PIPE AND EQUIPMENT IS 5200 BPH.
2. FOR TEMPORARY FILTER CONNECTIONS.

REV.	DATE	APP#	DESCRIPTION	APPROVAL
B1	09/09/15	384432307	REVISED FOR APPROVAL	SAS AMK ZBE
B	07/15/15	384432307	ISSUED FOR APPROVAL	MNB AMK ZBE
A1	04/30/15	384432307	ISSUED FOR REVIEW.	MNB AMK ZBE
A	03/31/15	384432307	ISSUED FOR REVIEW	LLC AMK ZBE

ENGINEERING RECORD	
DRAWN BY	MNBALOGH
CHECKED BY	A.KARPF
APPROVED BY	FKAY
DATE	2015/07/07
SCALE	NONE
REI PROJ #	02959

TETRA TECH ROONEY
(303) 792-5911

Sunoco Logistics Partners L.P.

ATTACHMENT F
PROCESS FLOW DIAGRAM
OHIO PIPELINE PROJECT
SUNOCO PIPELINE, L.P.
FOLLANSBEE STATION
BROOKE COUNTY, WV

OLD DRAWING NO.

DWG. NO. E_SYST_M032001

REV. NO. B1

Attachment G: Process Description – N/A (See Section 2)

Attachment H: Material Safety Data Sheets (MSDS)

Butane

MATERIAL SAFETY DATA SHEET (MSDS)
NORMAL BUTANE

IDENTITY (As Used on Label and List) **Normal Butane (DOT ID No: 1011 n-butane or UN 1075)**	**(Hazard Rating: Health-1/Fire-4/Reactivity-0)** **DOT Hazard Classification: 2.1 (Flammable Gas)**

Section I – Chemical Product and Company Identification

Manufacturer's Name **MARKWEST**	Emergency Phone Number **Markwest (800) 730-8388 / CHEMTREC (800) 424-9300**
Address (Number, Street, City, State and ZIP code) **1515 Arapahoe Street**	Telephone Number for Information: **(800) 730-8388**
Tower 1, Suite 1600	Date Prepared **June 21, 2014**
Denver, Colorado 80202-2126	Signature of Preparer (optional) **N/A**

Section II – Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name (s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Normal Butane (106-97-8)	**800 ppm**	**Not established**		**95**
Isobutane (75-28-5)	**800* ppm**	**Not established**		**<4**
Propane (74-98-6)	**1000 ppm**	**Not established**		**<1**

Section III – Physical/Chemical Characteristics

Boiling Point **31° F (-1° C) Based on N-Butane**		Specific Gravity (H_2O = 1): **~.58**	
Vapor Pressure (Reid): **36 to 38 psi at 100°F**		Melting Point: **N/A**	
Vapor Density (AIR = 1): **~ 2**		Evaporation Rate (Butyl Acetate = 1): **Very Rapid**	

Solubility in Water:
Slight

Appearance and Odor:
Colorless liquid under pressure. Faint hydrocarbon odor unless odorant is added.

Section IV – Fire and Explosion Hazard Data

Flash Point (Method Used): **–76° F (-60° C) Based on N-Butane**	Flammable Limits **Based on N-Butane**	LEL **1.5%**	UEL **9.0%**

Extinguishing Media:
Dry chemical, foam, carbon dioxide

Special Fire Fighting Procedures:
Shut off source of product as soon as possible. Use water to cool product storage vessels and personnel while shutting off source. Avoid extinguishing unless necessary to accomplish source shut off. Firemen must use proper protective equipment, including respiratory apparatus, to protect against hazardous combustion products/oxygen deficiencies.

Unusual Fire and Explosion Hazards:
Flames impinging on product storage vessels above the liquid level will cause sudden vessel failure in approximately 8 or more minutes, resulting in a BLEVE (Boiling Liquid Expansion Violent Explosion), unless vessel surfaces are kept cooled with water. If this cannot be done, evacuate the area. Liquid product will change to vapor rapidly at well below ambient temperatures and readily forms flammable mixtures with air. If exposed to an ignition source, it will burn in the open or be explosive in confined spaces. Its vapors are heavier than air and may travel long distances to a point of ignition and then flash back. Vapors will seek low lying areas.

Section V – Reactivity Data

Stability:	Unstable		Conditions to Avoid: **High heat, sparks, open flame**
	Stable	**X**	

Incompatibility (Materials to Avoid):
Strong oxidizers may ignite this material.

Hazardous Decomposition or Byproducts:
Carbon monoxide, volatile hydrocarbon vapors

Hazardous Polymerization	May Occur		Conditions to Avoid: **None**
	Will Not Occur	**X**	

Section VI – Health Hazard Data

Route(s) of Entry: Inhalation? Skin? Ingestion?
Inhalation: Vapors are virtually nontoxic below lower flammability limits. Above LEL, low moderate incidental effects such as CNS depression and irritation occur but are completely reversible upon cessation of exposure. At high concentrations, acts as a simple asphyxiant.

Skin: Contact with liquid may cause burns and frostbite. Skin may be flushed; as frostbite develops, skin may change to white or grayish-yellow: Blisters may appear.

Swallowing: Aspiration Hazard

Eyes: Direct contact with liquid or frost particles may produce severe and possibly permanent eye damage.

Health Hazards (Acute or Chronic):
Mildly toxic by inhalation, can cause drowsiness or asphyxia following exposures to high concentrations.

Carcinogenicity: **N/A** NTP? **N/A** IARC Monographs? **N/A** OSHA Registered **N/A**

Signs and Symptoms of Exposure:
Drowsiness, narcosis and asphyxia.

Medical Conditions Generally Aggravated by Exposure:
Personnel with pre-existing chronic respiratory diseases should avoid exposure to this material.

Emergency and First Aid Procedures:

Eyes: Rinse immediately with water. Remove contact lenses. Flush with water for 10-15 minutes. Consult a physician.

Skin: Warm frostbite areas gradually and get medical help if there is evidence of tissue damage.

Swallowed: Rinse mouth with water. Drink 1-2 glasses of milk or water. Do not induce vomiting unless directed by a physician.

Inhaled: Remove patients to fresh air. If breathing has stopped, restore breathing at once. Administer oxygen and get medical help.

Section VII – Precautions for Safe Handling and Use

Steps to be taken in Case Material is Released or Spilled:
Isolate spill or leak area immediately for at least 160 to 300ft in all directions. Keep unauthorized personnel away.

Waste Disposal Method:
Land disposal or burial (sanitary landfill)

Precautions to Be Taken in Handling and Storing:
Butane can be stored in liquid form under its vapor pressure at ambient temperatures, or refrigerated liquid can be stored at atmosphere pressure.

Other Precautions:
N/A

Section VIII – Control Measures

Respiratory Protection (Specify Type):
Wear positive pressure self-contained breathing apparatus.

Ventilation:	Local Exhaust	Special
N/A	Mechanical (General)	Other

Protective Gloves **Rubber gloves**	Eye Protection **Safety goggles**

Other Protective Clothing or Equipment:
Wear thermal protective clothing when handling refrigerated liquids. Clothing that becomes wet should immediately removed due to its flammability hazard.

Work/Hygienic Practices
Quick trench facilities and/or eye washing fountains should be provided within the immediate work area for emergency use.

N/A – Not Applicable
N/D – Not Determined
~ -- Approximately
***** -- Based on LP (Gas)

Propane

MATERIAL SAFETY DATA SHEET (MSDS)
PROPANE HD-5

IDENTITY (As Used on Label and List) **Propane or Liquefied Petroleum Gas** **(DOT ID No: UN 1075)**	**(Hazard Rating: Health-1/Fire-4/Reactivity-0)** **DOT Hazard Classification: Flammable Gas**

Section I – Chemical Product and Company Identification

Manufacturer's Name **MARKWEST**	Emergency Phone Number **Markwest (800) 730-8388 / CHEMTREC (800) 424-9300**
Address (Number, Street, City, State and ZIP code) **1515 Arapahoe Street**	Telephone Number for Information: **(800) 730-8388**
Tower 1, Suite 1600	Date Prepared **June 21, 2014**
Denver, Colorado 80202-2126	Signature of Preparer (optional) **N/A**

Section II – Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name (s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Propane (74-98-6)	**1000 ppm**	**N/A**		**90-95**
Propylene (115-07-01)	**N/A**	**NA**		**0-5**
Isobutane/subutane (75-28-5)	**800 ppm**	**N/A**		**0-2.5**

Section III – Physical/Chemical Characteristics

Boiling Point **-45° F**		Specific Gravity (H_2O = 1@ 39.2°F): **0.52**	
Vapor Pressure (mm Hg): **190 to 205 (psia at 100°F)**		Melting Point: **N/A**	
Vapor Density (AIR = 1at 60-90 °F): **1.5**		Evaporation Rate (Butyl Acetate = 1): **N/A**	

Solubility in Water:
Moderate

Appearance and Odor:
Colorless gas (liquid under pressure): propane sold for use as fuel contains mercaptan odorant.

Section IV – Fire and Explosion Hazard Data

Flash Point (Method Used): **GT - 160° F (est.)**	Flammable Limits **Normal Atmospheric**	LEL **~2.1%**	UEL **~9.5%**

Extinguishing Media:
Dry chemical, carbon dioxide, halogenated extinguishing agent

Special Fire Fighting Procedures:
Gas fires should not be extinguished unless the gas flow can be stopped immediately. Shut off gas source and allow the fire to burn itself out. If the source cannot be shut off immediately, all equipment and surfaces exposed to the fire should be cooled with water to prevent overheating, flashbacks, or explosions. Control fire until gas supply can be shut off. Firemen must use proper protective equipment including respiratory apparatus to protect against hazardous combustion products/oxygen deficiencies.

Unusual Fire and Explosion Hazards:
This gas releases flammable vapors at well below ambient temperatures and readily forms flammable mixtures with air. Exposed to an ignition source, it will burn in the open or be explosive in confined spaces. Its vapors are heavier than air and may travel long distances to a point of ignition, and then flash back. Alkane/Chlorine gas mixtures have produced explosions.

Section V – Reactivity Data

Stability:	Unstable		Conditions to Avoid: **Heat, sparks, and open flame**
	Stable	**X**	

Incompatibility (Materials to Avoid):
Strong acids, alkalies, and oxidizers such as chlorine (gas or liquid) and oxygen.

Hazardous Decomposition or Byproducts:
Combustion may produce carbon monoxide and other harmful substances.

Hazardous Polymerization	May Occur		Conditions to Avoid: **None**
	Will Not Occur	**X**	

Section VI – Health Hazard Data

Route(s) of Entry: Inhalation? Skin? Ingestion?
Inhalation: Exposure may produce rapid breathing, headache, dizziness, visual disturbance, muscular weakness, tremors, narcosis, unconsciousness, and death, depending on concentration and time of exposure.

Skin: This material is not expected to be absorbed through the skin. Non-irritating; but solid and liquid forms of this material and pressurized gas can cause freeze burns.

Swallowing: Solid and liquid forms of this material and the pressurized gas can cause freeze burns.

Eyes: This gas is non-irritating; but direct contact with liquefied/pressurized gas or frost particles may produce severe and possibly permanent eye damage from freeze burns.

Health Hazards (Acute or Chronic):
Asphyxiation and freeze burns. .

Carcinogenicity: **N/A** NTP? **N/A** IARC Monographs? **N/A** OSHA Registered **N/A**

Signs and Symptoms of Exposure:
Inhalation may produce mild intoxication, drowsiness, or loss of coordination.

Medical Conditions Generally Aggravated by Exposure:
High concentrations produce intoxication followed by loss of consciousness, asphyxiation, and death. Caution is recommended for personnel with pre-existing central nervous system disorders. Personnel with pre-existing chronic respiratory diseases should refrain from breathing this material

Emergency and First Aid Procedures:

Eyes: Vapors are not expected to present an eye irritation hazard. If contacted by liquid/solid, immediately flush the eye(s) gently with warm water for at least 15 minutes. Seek medical attention if pain or redness persists.

Skin: Frozen tissues should be flooded or soaked with warm water (105°-115°F.). Do not use hot water! Cryogenic burns, which result in blistering or deeper tissue freezing, should be promptly seen by a physician.

Swallowed: Induce vomiting with warm water (quart) only if patient is conscious. Immediately obtain medical attention.

Inhaled: Immediately move personnel to area of fresh air. For respiratory distress, give air oxygen, or administer CPR (cardiopulmonary resuscitation). If necessary, obtain medical attention if breathing difficulties continue.

Section VII – Precautions for Safe Handling and Use

Steps to be taken in Case Material is Released or Spilled:
Eliminate and prevent source of ignition. Evacuate all non-essential personnel to an area upwind. (At least ½ mile in all directions if tanks or tank cars are involved in fire.) Stop source of release with non-sparking tools before putting out any fire. Ventilate enclosed areas to prevent formation of flammable or oxygen-deficient atmospheres. Water spray may be used to reduce vapors. Closed systems form white frost at the point of leak. Liquid spills will vaporize forming cold dense vapor cloud even with proper respiratory equipment.

Waste Disposal Method:
Releases are expected to cause only localized, non-persistent environmental damage. Waste mixtures containing these gases should not be allowed to enter drains or sewers where there is danger of their vapors becoming ignited. When it becomes necessary to dispose of these gases, it is preferable to do so as a vapor. Unused product may be used as an auxiliary fuel or disposed by burning in a properly designed flare or incinerator. Venting of gas to the atmosphere should be avoided. Defective, empty, or partially used portable containers should be returned to the supplier with appropriate tags.

Precautions to Be Taken in Handling and Storing:
Do not attempt to clean since residue is difficult to remove. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

Other Precautions:
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

Section VIII – Control Measures

Respiratory Protection (Specify Type):
For excessive gas concentrations, use only NIOSH/MSHA approved, self-contained breathing apparatus. Respirator use should comply with OSHA 29 OFR 19910, 134 or equivalent.

Ventilation:	Local Exhaust **Essential in work areas to prevent accumulation of explosive mixtures.**	Special
	Mechanical (General) **Essential in work areas to prevent accumulation of explosive mixtures.**	Other **If mechanical ventilation is used, electrical equipment must meet N.E.C. requirements.**

Protective Gloves **Insulated impervious plastic or neoprene-coated canvas gloves.**	Eye Protection **Chemical-type goggles and face shield when handling liquefied gases. Safety glasses and/or face shields are recommended when handling high-pressure cylinders and piping systems and whenever vapors are discharged**

Other Protective Clothing or Equipment:
Protective gear (apron) to protect skin areas.

Work/Hygienic Practices

Emergency eye wash fountains and safety showers should be available in the vicinity of any potential exposure. Personnel should not enter areas where the atmosphere is below 19.5 vol.% oxygen without special procedures/equipment.

N/A – Not Applicable
N/D – Not Determined
~ -- Approximately
***** -- Based on LP (Gas)

Attachment I: Emission Units Table

Attachment I

Emission Units Table

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

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
F-9708	F-9708	John Zink Enclosed Flare	2016	10MMBtu/hr	New	1C
FE-01	FE-01	Fugitives	2016	N/A	New	None

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

Attachment J: Emission Points Data Summary Sheet

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m[4])
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
F-9708	Upward vertical stack	F-9708	John Zink Enclosed Flare	1C	Flare	N/A	N/A	VOCs NO_X SO_X CO HAPs CO_2e	472.71 0 0 0 0 0	6.81 0 0 0 0 0	9.48 0.68 0.03 3.12 0.00004 1,442.9	0.26 0.02 0.002 0.11 0.0002 50.5	Gas	ST[A], O[B] O[B] O[C] O[B] O[D] O[E]	
FE-01	Fugitives	FE-01	Fugitives	None	Equipment, valves, fittings, seal leaks	N/A	N/A	n-Butane/106-97-8 i-butane/75-28-5 Propane/74-98-6	0.04	0.19	0.04	0.19	Gas	O[F]	

A. Please see Attached. Air Hygiene, Inc., "Stack Emissions Study EPA 40 CFR Part 60 Subpart OOOO for The ZTOF025X15PF Unit", Prepared for John Zink, Co LLC, at The Tulsa R&D Facility Tulsa, Oklahoma October 23-25, 2013.
B. Factors taken from AP-42 Chapter 13.5 for Industrial Flares, Table 13.5-1 and 13.5-2, April 2015.
C. Assumes all Sulfur in the product is converted to SO2.
D. The Total HAP emission factor for the Propane Pilot Flame was estimated using AP-42, Section 1.4, Table 1.4-3. Emission Factors for Speciated Organic Compounds from Natural Gas Combustion.
E. GHG emission factors taken from Table C-1 and C-2 of 40 CFR Part 98, Subpart C .
F. Leak emission factors are from the USEPA Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November, 1995, Table 2-3. Leak emission factors are for total organic compound emissions from light liquid service for the natural gas liquids (butane). Assume the total organic compound emissions is equivalent to total VOCs.

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

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

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

3 List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S,

Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

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

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

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

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

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
F-9708	4	1,552	5,705	7.57	1,150 ft	34 ft	4454004	538797
FE-01	N/A	60	0.01	minimal	1,150 ft	0 ft	4454012	538832

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

Attachment K: Fugitive Emissions Data Summary Sheet

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

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

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

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

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads						
Unpaved Haul Roads	Dust/Dirt: PM PM_{10}	 0.34 0.15	 1.51 0.68	 0.14 0.06	 0.60 0.27	EE, O[A]
Storage Pile Emissions						
Loading/Unloading Operations						
Wastewater Treatment Evaporation & Operations						
Equipment Leaks	n-Butane/106-97-8 i-butane/75-28-5 Propane/74-98-6	0.04	0.19	0.04	0.19	EE
General Clean-up VOC Emissions						
Other						

A. Particulate emission calculations form vehicular travel on unpaved roads are based on Attachment L Unpaved Haul Roads of the WVDEP NSR Form and AP-42 Fifth Edition Chapter 13.2.2 Unpaved Roads.

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

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

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

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

Attachment L: Emissions Unit Data Sheets

FE-01

Attachment L
EMISSIONS UNIT DATA SHEET
CHEMICAL PROCESS

For chemical processes please fill out this sheet and all supplementary forms (see below) that apply. Please check all supplementary forms that have been completed.

☐ *Emergency Vent Summary Sheet*
☒ *Leak Sources Data Sheet*
☐ *Toxicology Data Sheet*
☐ *Reactor Data Sheet*
☐ *Distillation Column Data Sheet*

1. Chemical process area name and equipment ID number (as shown in *Equipment List Form*)
   Fugitive Emissions FE-01

2. Standard Industrial Classification Codes (SICs) for process(es)
   4619

3. List raw materials and ☒ attach MSDSs
   Butane
   Propane

4. List Products and Maximum Production and ☐ attach MSDSs

Description and CAS Number	Maximum Hourly (lb/hr)	Maximum Annual (ton/year)
N/A		

5. Complete the *Emergency Vent Summary Sheet* for all emergency relief devices.

6. Complete the *Leak Source Data Sheet* and describe below or attach to application the leak detection or maintenance program to minimize fugitive emissions. Include detection instruments, calibration gases or methods, planned inspection frequency, and record-keeping, and similar pertinent information. If subject to a rule requirement (e.g. 40CFR60, Subpart VV), please list those here.
   SPLP will implement a leak detection and repair program using audible, visual, and olfactory detection ("AVO") methods on a monthly basis to satisfy BAT for fugitive emissions. At the time of detection, repairs (tightening packing, tightening flange volts, etc.) will be attempted and logged. If the repair is not successful, the component will be adde to the facility shutdown repair list, that is, repairs will be attempted during the next unit/equipment outage.

7. Clearly describe below or attach to application Accident Procedures to be followed in the event of an accidental spill or release.

   There are emergency procedures in place that will, as necessary, promptly shut down and isolate a pipeline or tank, dispatch first responders and take measures to protect human health and the environment. Contract is made with oil spill response organizations (OSROs) and response contractors to supply emergency response equipment and/or personnel to ensure a rapid, organized and safe response to any emergency situation. There are also public awareness and community outreach programs to inform the public about our operations and to enlist their assistance in reducing the potential for an emergency situation.

8A. Complete the *Toxicology Data Sheet* or attach to application a toxicology report (an up-to-date material safety data sheets (MSDS) may be used) outlining the currently known acute and chronic health effects of each compound or chemical entity emitted to the air. If these compounds have already been listed in Item 3, then a duplicate MSDS sheet is not required. Include data such as the OSHA time weighted average (TWA) or mutagenicity, teratogenicity, irritation, and other known or suspected effects should be addressed. Indicate where these are unknown, and provide references.

8B. Describe any health effects testing or epidemiological studies on these compounds that are being or may be conducted by the company or required under TSCA, RCRA or other federal regulations. Discuss the persistence in the environment of any emission (e.g. pesticides, etc.).

9. **Waste Products** - Waste products status: (If source is subject to RCRA or 45CSR25, please contact the Hazardous Waste Section of WVDEP, OAQ at (304) 926-3647.)

9A. Types and amounts of wastes to be disposed:

9B. Method of disposal and location of waste disposal facilities: during normal operation, only trash will be generated/garbash

Carrier: Phone:

9C. Check here if approved USEPA/State Hazardous Waste Landfill will be used ☐

10. Maximum and Projected Typical Operating Schedule for process or project as a whole (circle appropriate units).

circle units:	(hrs/day) (hr/batch)	(days), (batches/day), (batches/week)	(days/yr), (weeks/year)
10A. Maximum			
10B. Typical			

11. Complete a *Reactor Data Sheet* for each reactor in this chemical process.

12. Complete a *Distillation Column Data Sheet* for each distillation column in this chemical process.

13. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:
The Facility will implement a LDAR program using AVO detection (AVO) methods on a monthly basis for fugitive emissions. The Facility personnel will conduct monthly inspections for visible stack emissions, fugitive emissions, and malodors. This stack emission observation will not be require to be performed by a person certified as a qualified observer under EPA Method 9 for Visual Determination of the Opacity of Emissions from Stationary Sources.

RECORDKEEPING
Records of each inspection will be maintained on site for a period of five (5) years and available upon request. The inspection records will identify each leak and the time until it is repaired.

REPORTING
None

TESTING
None

MONITORING. Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment operation or air pollution control device.

RECORDKEEPING. Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING. Please describe the proposed frequency of reporting of the recordkeeping.

TESTING. Please describe any proposed emissions testing for this process equipment or air pollution control device.

14. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
None

INFORMATION REQUIRED FOR CHEMICAL PROCESSES

The notes listed below for chemical processes are intended to help the applicant submit a complete application to the OAQ; these notes are not intended to be all inclusive. The requirements for a complete application for a permit issued under 45CSR13 are designed to provided enough information for a permit reviewer to begin a technical review. Additional information beyond that identified may be required to complete the technical review of any individual application.

Process Description

Please keep these points in mind when completing your process description as part of this permit application.

1. Provide a general process overview. This brief, but complete, process description should include chemical or registered trademark names of chemical products, intermediates, and/or raw materials to be produced or consumed, and the ultimate use(s) of the product(s). A list of the various chemical compounds is helpful.
2. Describe <u>each</u> <u>process</u> <u>step</u>. Include the process chemistry and stoichiometrically balanced reaction equation or material mass balance on all components.
3. Describe the methods and equipment used to receive, store, handle, and charge raw materials.
4. Describe the methods and equipment used to handle, store, or package final products and intermediates.
5. Provide process flow diagrams or equipment layout drawings which clearly show the process flow relationships among all pieces of process and control equipment. Identify all air emission discharge points. Discuss instrumentation and controls for the process.
6. Discuss the possibilities of process upsets, the duration and frequency of upsets, and consequences (including air emissions) of these upsets. Include a description of rupture discs, pressure relief valves, and secondary containment systems.
7. Discuss any fugitive emissions and the methods used to minimize them.
8. Include the following plans for the process if available:
    a. preventative maintenance and malfunction abatement plan (recommended for all control equipment).
    b. continuous emissions (in-stack) monitoring plan
    c. ambient monitoring plan
    d. emergency response plan

Regulatory Discussion

The following state and federal air pollution control regulations may be applicable to your chemical process. You should review these regulations carefully to determine if they apply to your process. Please summarize the results of your review in your permit application along with any other regulations you believe are applicable.

- Title 45 Legislative Rule Division of Environmental Protection, Office of Air Quality contains West Virginia's air pollution control regulations, including the following promulgated rules which may require emissions reductions or control technologies for your chemical process:
    a. 45CSR27 - Best Available Technology (BAT) for Toxic Air Pollutants (TAPs)
    b. 45CSR21 - VOC emissions controls for ozone maintenance in Kanawha, Cabell, Putnam, Wayne, and Wood counties.
    c. 45CSR13 (Table 45-13A) - plantwide emission thresholds for permitting for certain pollutants.
- Federal Guidelines for case-by-case MACT determinations under section 112(g) of the 1990 CAAA for individual and total HAPs greater than 10 and 25 tons per year, respectively.
- There are also subparts of the federal Standards of Performance for New Stationary Sources (NSPS), 40CFR60 60, and the National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40CFR61 and 40CFR63, which apply to various chemical and nonchemical processes. These subparts are too numerous to list here, but these areas of the federal regulations should be consulted carefully to determine applicability to your process.

Emissions Summary and Calculations

Please keep these points in mind when submitting your emissions calculations as part of this permit application.

1. For each pollutant, provide the basis for the emissions estimate and for all emission reduction(s) or control efficiency(ies) claimed.
2. For all <u>batch</u> processes provide the following
    a. Emissions of each pollutant in pound(s) per batch, from each process step
    b. Annual emissions based on number of batches requested per year
    c. The total time for each process step and the duration of the emissions during the process step
    d. Total batch time, total emissions per batch (or per day), and annual emissions based on the number of batches requested per year.

EMERGENCY VENT SUMMARY SHEET

List below all emergency relief devices, rupture disks, safety relief valves, and similar openings that will vent only under abnormal conditions.

Emission Point ID[1]	Equipment to Relief Vent (type, ID if available)[2]	Relief Vents (type) & Set Pressure (psig)	Name of Chemical(s) or Pollutants Controlled	Worst Case Emission per Release Event (lbs)
None	See Emission Calcs	See Emission Calcs	See Emission calcs	See Emission Calcs

All routine vents (non-emergency) should be listed on the *Emission Points Data Summary Sheet.*

[1] Indicate the emission point, if any, to which source equipment normally vents. Do not assign emission point ID numbers to each emergency relief vent or device.

[2] List all emergency relief devices next to the piece of equipment from which they control releases.

LEAK SOURCE DATA SHEET

Source Category	Pollutant	Number of Source Components[1]	Number of Components Monitored by Frequency[2]	Average Time to Repair (days)[3]	Estimated Annual Emission Rate (lb/yr)[4]
Pumps[5]	light liquid VOC[6,7]				
	heavy liquid VOC[8]				
	Non-VOC[9]				
Valves[10]	Gas VOC				
	Light Liquid VOC	234	NA	14	194.3, EE, EPA
	Heavy Liquid VOC				
	Non-VOC				
Safety Relief Valves[11]	Gas VOC	1	NA	14	2.5, EE, EPA
	Non VOC				
Open-ended Lines[12]	VOC				
	Non-VOC				
Sampling Connections[13]	VOC				
	Non-VOC				
Compressors	VOC				
	Non-VOC				
Flanges	VOC	411	NA	14	63.5, EE, EPA
	Non-VOC				
Other	VOC	35	NA	14	87.9, EE, EPA
	Non-VOC				

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

Notes for Leak Source Data Sheet

1. For VOC sources include components on streams and equipment that contain greater than 10% w/w VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.

2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in ppm. Do not include monitoring by visual or soap-bubble leak detection methods. "M/Q(M)/Q/SA/A/O" means the time period between inspections as follows:

   Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/Other (specify time period)

   If source category is not monitored, a single zero in the space will suffice. For example, if 50 gas-service valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with non checked at any other frequency, you would put in the category "valves, gas service:" 0/50/0/75/0/50 (bimonthly).

3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.

4. Note the method used: MB - material balance; EE - engineering estimate; EPA - emission factors established by EPA (cite document used); O - other method, such as in-house emission factor (specify).

5. Do not include in the equipment count sealless pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)

6. Volatile organic compounds (VOC) means the term as defined in 40 CFR □51.100 (s).

7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a light liquid.

8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a heavy liquid.

9. LIST CO, H_2S, mineral acids, NO, NO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.

11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or if the valve vents to a control device.

12 Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.

13. Do not include closed-purge sampling connections.

TOXICOLOGY DATA SHEET[1]

Descriptor Name/CAS Number	OSHA Limits[2]		Acute[3] TC_{LO} - Animal LC_{LO} - Animal LC_{50} - Animal	Chronic[4]	Irritation[5]	References
	TWA	CL				
None						

[1] Indicate by "ND" where no data exists, in company's knowledge.
[2] Time Weighted Average, Ceiling Limit, or other, with units.
[3] If inhalation data is not available, provide other data as available.
[4] Relying on animal or human studies, indicate if any data suggests: C = carcinogenicity, M = mutagenicity, T = teratogenecity, O = oncogenicity.
[5] Indicate if there are dermal or eye irritation effects and whether they are considered to be low, moderate, or severe.

REACTOR DATA SHEET

Provide the following information for <u>each</u> piece of equipment that is a potential or actual source of emissions as shown on the *Equipment List Form* and other parts of application.

Identification Number (as shown on *Equipment List Form*): None

1. Name and type of equipment (e.g. CSTR, plug flow, batch, etc.)

2. Type of operation ☐ Batch ☐ Continuous ☐ Semi-batch

3. Projected Actual Equipment Operating Schedule (complete appropriate lines):

hrs/day	days/week	weeks/year
hrs/batch	batches/day, weeks (Circle one)	day,weeks/yr (Circle one)

4. Feed Data Flow In = gal/hr, or gal/batch

Material Name & CAS No.	Phase[a]	Specific Gravity	Vapor Pressure[b]	Charge Rate			Fill Time (min/batch, run)[c]
				Normal	Max	Units	

a. S = Solid, L = Liquid, G = gas or vapor
b. At feed conditions
c. Total time that equipment is filling per batch or run (start-up), for tank or vessel-type equipment.

5. Provide all **chemical reactions** that will be involved (if applicable), including the residence time and any side reactions that may occur as well as gases that may be generated during these reactions. Indicate if the reaction(s) are exothermic or endothermic.

6. Maximum Temperature	7A. Maximum Pressure 7B. Max. Set Pressure for venting	
°C	mmHg	mmHg
°F	psig	psig

8. Output Data Flow Out = gal/hr or gal/batch

Material Name and CAS No.	Phase	Specific Gravity	Vapor Pressure	Hourly or Batch Output Rate		
				Normal	Maximum	Units

9. Complete the following emission data for equipment connected to a header exhaust system, giving emissions levels before entering header system (i.e. before control equipment).

☒ Check here if not applicable

Emission Point ID (exhaust point of header system):

Material Name and CAS No.	Maximum Potential Emission Rate (lb/hr)	Method **

** MB - material balance: EE - Engineering Estimate: TM - Test Measurement (submit test data): O - other (Explain)

10. Provide the following information pertaining to each condenser that may be attached to this reactor. Attach additional pages as necessary if more than one condenser is used for this reactor. Complete the Condenser Air Pollution Control Device Sheet if necessary.

☒ Check here if not applicable

10A. Cooling material

10B. Minimum and Maximum flowrate of cooling material (gal/hr)

10C. Inlet temperature of cooling material (°F)

10D. Outlet temperature of cooling material (°F)

10E. Pressure drop of gas to be condensed from inlet to outlet (psig)

10F. Inlet temperature of gas stream (°F)

10G. Outlet temperature of gas stream (°F)

10H. Number of passes

10I. Cooling surface area

11. Provide the following pertaining to auxiliary equipment that burns fuel (heaters, dryers, etc.):

☒ Check here if not applicable

11A. Type of fuel and maximum fuel burn rate, per hour:

11B. Provide maximum percent sulfur (S), ash content of fuel, and the energy content using appropriate units:

%S % Ash BTU/lb, std. ft^3/day, gal

(circle one)

11C. Theoretical combustion air requirement in SCFD per unit of fuel (circle appropriate unit) @ 70°F and 14.7 PSIA:

SCFD/lb, SCFD, gal (circle one)

11D. Percent excess air: %

11E. Type, amount, and BTU rating of burners and all other firing equipment that are planned to be used:

11F. Total maximum design heat input: $\times 10^6$ BTU/hr.

12. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
REPORTING	TESTING

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION OR AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT OR AIR POLLUTION CONTROL DEVICE.

13. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

NOTE: An *AIR POLLUTION CONTROL DEVICE SHEET* must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this reactor.

DISTILLATION COLUMN DATA SHEET

Identification Number (as assigned on *Equipment List Form*): NONE

1. Name and type of equipment None

#. Projected actual equipment operating schedule (complete appropriate lines):

hrs/day	days/week	weeks/year
hrs/batch	batches/day, batches/week (circle one)	days/yr, weeks/yr (circle one)

2. Number of stages (plates), excluding condenser

3. Number of feed plates and stage location

4. Specify details of any reheating, recycling, or stage conditioning along with the stage locations

5. Specify reflux ratio, R (where R is defined as the ratio of the reflux to the overhead product, given symbolically as R=L/D, where L = liquid down column, D = distillation product)

6. Specify the fraction of feed which is vaporized, f (where f is the molal fraction of the feed that leaves the feed plate continuously as vapor).

7A. Type of condenser used: ☐ total ☐ partial ☐ multiple ☐ other

7B. For each condenser provide process operating details including all inlet and outlet temperatures, pressures, and compositions.

8. Feed Characteristics
   A. Molar composition
   B. Individual vapor pressure of each component
   C. Total feed stage pressure
   D. Total feed stage temperature
   E. Total mass flow rate of each stream into the system

9. Overhead Product
   A. Molar composition of components
   B. Vapor pressure of components
   C. Total mass flow rate of all streams leaving the system as overhead products

10. Bottom Product
   A. Molar composition of all components
   B. Total mass flow rate of all steams leaving the system as bottom products

11. General Information
    A. Distillation column diameter
    B. Distillation column height
    C. Type of plates
    D. Plate spacing
    E. Murphree plate efficiency
    F. Any other information necessary of describe the operation of this distillation column.

12. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
    Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
REPORTING	TESTING

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION OR AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT OR AIR POLLUTION CONTROL DEVICE.

13. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

NOTE: An *AIR POLLUTION CONTROL DEVICE SHEET* must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this distillation column.

TK-9702

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Follansbee Station	2. Tank Name Flare Knock Out Tank
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) TK-9702	4. Emission Point Identification No. (as assigned on *Equipment List Form*) TK-9702
5. Date of Commencement of Construction (for existing tanks) 11/2015	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) NA	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): Only equipment fugitives are associated with these sphere.	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 400 cubic feet	
9A. Tank Internal Diameter (ft) 60"	9B. Tank Internal Height (or Length) (ft) 18'-9"
10A. Maximum Liquid Height (ft) NA	10B. Average Liquid Height (ft) NA
11A. Maximum Vapor Space Height (ft) NA	11B. Average Vapor Space Height (ft) NA
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. Empty	

13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
NA	NA

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)
NA

15. Maximum tank fill rate (gal/min) NA

16. Tank fill method ☐ Submerged ☐ Splash ☐ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
NA	NA

18. Type of tank (check all that apply):
☐ Fixed Roof ___ vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof
___ other (describe)
☐ External Floating Roof ___ pontoon roof ___ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ___ vertical column support ___ self-supporting
☐ Variable Vapor Space ___ lifter roof ___ diaphragm
☒ Pressurized ___ spherical X cylindrical
☐ Underground
☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☒ Other (describe) welded

20A. Shell Color	20B. Roof Color	20C. Year Last Painted

21. Shell Condition (if metal and unlined):
☐ No Rust ☐ Light Rust ☐ Dense Rust ☒ Not applicable

22A. Is the tank heated? ☐ YES ☒ NO

22B. If YES, provide the operating temperature (°F) NA

22C. If YES, please describe how heat is provided to tank. NA

23. Operating Pressure Range (psig): 0 to 1,480

24. Complete the following section for **Vertical Fixed Roof Tanks** ☒ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☒ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one)
☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal
☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:

ACCESS HATCH		
BOLT COVER, GASKETED: One (1) - 32" Manway	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED: Two (2) 2"	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED: None	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:

LADDER WELL	
PIP COLUMN – SLIDING COVER, GASKETED: NA	PIPE COLUMN – SLIDING COVER, UNGASKETED:

GAUGE-HATCH/SAMPLE PORT	
SLIDING COVER, GASKETED: NA	SLIDING COVER, UNGASKETED:

ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED: NA	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)

VACUUM BREAKER	
WEIGHTED MECHANICAL ACTUATION, GASKETED: NA	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

RIM VENT	
WEIGHTED MECHANICAL ACTUATION GASKETED: NA	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

DECK DRAIN (3-INCH DIAMETER)	
OPEN: NA	90% CLOSED: NA

STUB DRAIN

1-INCH DIAMETER:

NA

OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)

Flare Knockout pressure vessel used to collect any free liquid prior to flowing to flare. The system is for butane and propane.

26. Complete the following section for Internal Floating Roof Tanks ☒ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Wellsburg, WV	
28. Daily Average Ambient Temperature (°F)	52.95
29. Annual Average Maximum Temperature (°F)	63.2
30. Annual Average Minimum Temperature (°F)	42.7
31. Average Wind Speed (miles/hr)	17.06
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))	1,202
33. Atmospheric Pressure (psia)	14.11

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☐ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☒ Other[1] (describe): flare

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
NA					

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☒ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

TK-9708

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Follansbee Station	2. Tank Name Propane Tank
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) TK-9708	4. Emission Point Identification No. (as assigned on *Equipment List Form*) TK-9708
5. Date of Commencement of Construction (for existing tanks) 11/2015	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) NA	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): Pressure vessel to provide fuel to pilot for enclosed flare.	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 1,000 gallons	
9A. Tank Internal Diameter (ft) 41"	9B. Tank Internal Height (or Length) (ft) 16'
10A. Maximum Liquid Height (ft) NA	10B. Average Liquid Height (ft) NA
11A. Maximum Vapor Space Height (ft) NA	11B. Average Vapor Space Height (ft) NA
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 800 gallons	

13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
NA	NA

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)
NA

15. Maximum tank fill rate (gal/min) NA

16. Tank fill method ☐ Submerged ☐ Splash ☐ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year
NA	NA

18. Type of tank (check all that apply):
☐ Fixed Roof ___ vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof
___ other (describe)
☐ External Floating Roof ___ pontoon roof ___ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ___ vertical column support ___ self-supporting
☐ Variable Vapor Space ___ lifter roof ___ diaphragm
☒ Pressurized ___ spherical X cylindrical
☐ Underground
☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☒ Other (describe) welded

20A. Shell Color	20B. Roof Color	20C. Year Last Painted

21. Shell Condition (if metal and unlined):
☐ No Rust ☐ Light Rust ☐ Dense Rust ☒ Not applicable

22A. Is the tank heated? ☐ YES ☒ NO

22B. If YES, provide the operating temperature (°F) -50 to 100°F

22C. If YES, please describe how heat is provided to tank. NA

23. Operating Pressure Range (psig): 0 to 1,480

24. Complete the following section for **Vertical Fixed Roof Tanks** ☒ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☒ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one)
☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal
☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:

ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
NA	NA	NA

AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
NA	NA	NA

COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
NA	NA	NA

LADDER WELL	
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:
NA	NA

GAUGE-HATCH/SAMPLE PORT	
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:
NA	NA

ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
NA	NA	NA

VACUUM BREAKER	
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:
NA	NA

RIM VENT	
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:
NA	NA

DECK DRAIN (3-INCH DIAMETER)	
OPEN:	90% CLOSED:
NA	NA

STUB DRAIN
1-INCH DIAMETER:
NA

OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)

26. Complete the following section for Internal Floating Roof Tanks ☒ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. Wellsburg, WV	
28. Daily Average Ambient Temperature (°F)	52.95
29. Annual Average Maximum Temperature (°F)	63.2
30. Annual Average Minimum Temperature (°F)	42.7
31. Average Wind Speed (miles/hr)	17.06
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))	1,202
33. Atmospheric Pressure (psia)	14.11

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☐ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☐ Other[1] (describe):

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss		Annual Loss (lb/yr)	Estimation Method[1]
		Amount	Units		
Propane	0.0003	NA	NA	0.0003	Pressurized Tank, EPA

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☒ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable. TANKS is NA. Only losses are fugitive associated with relief valve to atmosphere. See Attachment N for fugitive calculations.

Haul Road Fugitives

Attachment L
FUGITIVE EMISSIONS FROM UNPAVED HAULROADS

UNPAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

		PM	PM-10
k =	Particle size multiplier	0.80	0.36
s =	Silt content of road surface material (%)	10	10
p =	Number of days per year with precipitation >0.01 in.	140	140

Item Number	Description	Number of Wheels	Mean Vehicle Weight (tons)	Mean Vehicle Speed (mph)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1	Example Vehicle-Ford F250 Super CAB LWB	4	3.73	30	1.46	0.17	1,460	TR-01	60
2									
3									
4									
5									
6									
7									
8									

Source: *AP-42 Fifth Edition – 13.2.2 Unpaved Roads*

$E = k \times 5.9 \times (s \div 12) \times (S \div 30) \times (W \div 3)^{0.7} \times (w \div 4)^{0.5} \times ((365 - p) \div 365) =$ lb/Vehicle Mile Traveled (VMT)

Where:

		PM	PM-10
k =	Particle size multiplier	0.80	0.36
s =	Silt content of road surface material (%)	10	10
S =	Mean vehicle speed (mph)	30	30
W =	Mean vehicle weight (tons)	3.73	3.73
w =	Mean number of wheels per vehicle	4	4
p =	Number of days per year with precipitation >0.01 in.	140	140

For lb/hr: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF UNPAVED HAULROAD EMISSIONS

Item No.	PM				PM-10			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
1	0.34	1.51	0.14	0.60	0.15	0.68	0.06	0.27
2								
3								
4								
5								
6								
7								
8								
TOTALS								

FUGITIVE EMISSIONS FROM PAVED HAULROADS

INDUSTRIAL PAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

I =	Industrial augmentation factor (dimensionless)	
n =	Number of traffic lanes	
s =	Surface material silt content (%)	
L =	Surface dust loading (lb/mile)	

Item Number	Description	Mean Vehicle Weight (tons)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1							
2							
3							
4							
5							
6							
7							
8							

Source: *AP-42 Fifth Edition – 11.2.6 Industrial Paved Roads*

$E = 0.077 \times I \times (4 \div n) \times (s \div 10) \times (L \div 1000) \times (W \div 3)^{0.7}$ = lb/Vehicle Mile Traveled (VMT)

Where:

I =	Industrial augmentation factor (dimensionless)	
n =	Number of traffic lanes	
s =	Surface meterial silt content (%)	
L =	Surface dust loading (lb/mile)	
W =	Average vehicle weight (tons)	

For lb/hr: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF PAVED HAULROAD EMISSIONS

Item No.	Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY
1				
2				
3				
4				
5				
6				
7				
8				
TOTALS				

Attachment M: Air Pollution Control Device Sheets

Attachment M
Air Pollution Control Device Sheet
(FLARE SYSTEM)

Control Device ID No. (must match Emission Units Table): F-9708

Equipment Information

1. Manufacturer: John Zink

   Model No. ZTOF040X30PF

2. Method:
   - ☐ Elevated flare
   - ☐ Ground flare
   - ☒ Other

   Describe: Enclosed Flare

3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

4. Method of system used:
   ☐ Steam-assisted ☐ Air-assisted ☐ Pressure-assisted ☒ Non-assisted

5. Maximum capacity of flare:
   - 68.7 scf/min
   - 4,120 scf/hr

6. Dimensions of stack:
   - Diameter 4 ft.
   - Height 30 ft.

7. Estimated combustion efficiency:
   (Waste gas destruction efficiency)
   - Estimated: 98 %
   - Minimum guaranteed: 98 %

8. Fuel used in burners:
   - ☐ Natural Gas
   - ☐ Fuel Oil, Number
   - ☒ Other, Specify: Propane

9. Number of burners: 1

   Rating: 10,000,000 BTU/hr

10. Will preheat be used? ☐ Yes ☒ No

11. Describe method of controlling flame:
    Propane pilot gas will be controlled by the NEMA 4 Flare Control Panel.

12. Flare height: 34 ft

13. Flare tip inside diameter: 3.96 ft

14. Natural gas flow rate to flare pilot flame per pilot light:
    - 0.37 scf/min
    - 22 scf/hr

15. Number of pilot lights:

    Total 1 @ 50,000 BTU/hr

16. Will automatic re-ignition be used?
    ☒ Yes ☐ No

17. If automatic re-ignition will be used, describe the method:
    The pilot flame monitoring the thermocouple signals the NEMA 7 Ignition Control Panel if the pilot flame goes out. Then the KE-1B Electronic Ignition Flare Pilot Assembly, NEMA 7 Ignition transformer, pilot spark electrode, and ignition wire reignite the pilot.

18. Is pilot flame equipped with a monitor? ☒ Yes ☐ No

    If yes, what type?
    - ☒ Thermocouple
    - ☐ Infra-Red
    - ☐ Ultra Violet
    - ☐ Camera with monitoring control room
    - ☒ Other, Describe: 24 hours a day seven days a week via a supervisory control and data acquisition (SCADA) system

19. Hours of unit operation per year: 8,760 hr/yr

Steam Injection

20. Will steam injection be used? ☐ Yes ☒ No	21. Steam pressure PSIG Minimum Expected: Design Maximum:
22. Total Steam flow rate: LB/hr	23. Temperature: °F
24. Velocity ft/sec	25. Number of jet streams
26. Diameter of steam jets: in	27. Design basis for steam injected: LB steam/LB hydrocarbon
28. How will steam flow be controlled if steam injection is used?	

Characteristics of the Waste Gas Stream to be Burned

29.

Name	Quantity Grains of H_2S/100 ft^3	Quantity (LB/hr, ft^3/hr, etc)	Source of Material
Butane/Propane	2.00	0.00009 LB/hr	Maint/Pilot Gas/GC

30. Estimate total combustible to flare: 0.54 ACF/hr LB/hr or ACF/hr
(Maximum mass flow rate of waste gas) 3,082 scfm

31. Estimated total flow rate to flare including materials to be burned, carrier gases, auxiliary fuel, etc.:
32.12 acfm LB/hr or ACF/hr

32. Give composition of carrier gases:
Not Applicable

33. Temperature of emission stream: 1,552 °F Heating value of emission stream: 0 BTU/ft^3 Mean molecular weight of emission stream: MW = 28.79 lb/lb-mole	34. Identify and describe all auxiliary fuels to be burned. Not Applicable BTU/scf BTU/scf BTU/scf BTU/scf BTU/scf
35. Temperature of flare gas: 1,552 °F	36. Flare gas flow rate: 32.12 scf/min
37. Flare gas heat content: 3,244 BTU/ft^3	38. Flare gas exit velocity: 19,510 scf/min
39. Maximum rate during emergency for one major piece of equipment or process unit: 3,082 scf/min	
40. Maximum rate during emergency for one major piece of equipment or process unit: 0.17 BTU/min	
41. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification): None	
42. Describe the collection material disposal system:	
43. Have you included ***Flare Control Device*** in the Emissions Points Data Summary Sheet? No	

44. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
The flare will be monitored 24 hours a day seven days a week via a supervisory control and data acquisition (SCADA) system and a physical inspection will occur periodically.	The flare will have continuous monitoring with Human Machine Interface (HMI).
REPORTING:	TESTING:

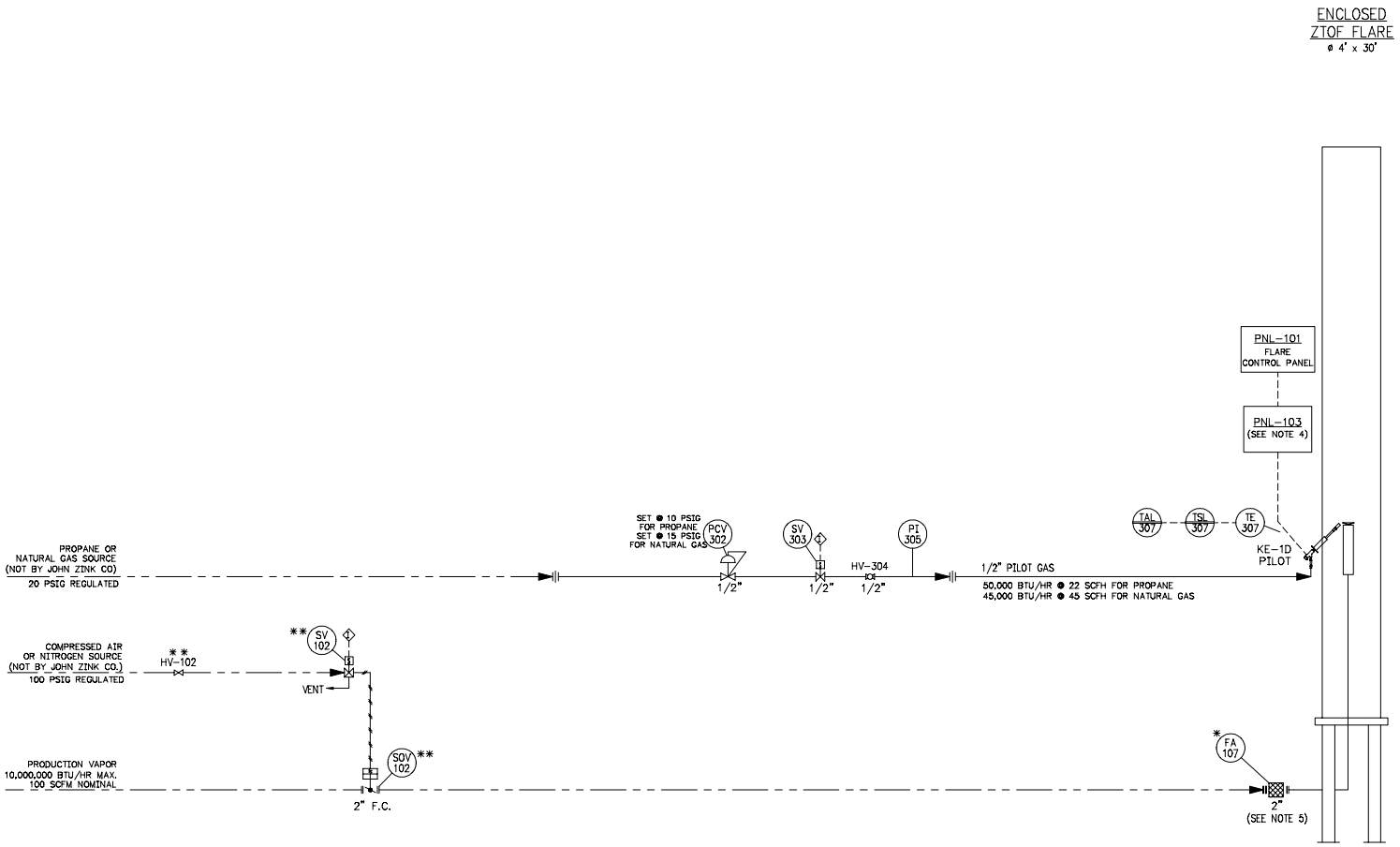
MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
98%

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
98%

47. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

Enclosed ZTOF Flare Process and Instrument Diagram



NOTES:

1. * - SUPPLIED BY JOHN ZINK CO. AND SHIPPED LOOSE FOR FIELD INSTALLATION.
2. * * - SUPPLIED BY OTHERS (NOT BY JOHN ZINK CO.)
3. ELECTRICAL AREA CLASSIFICATION: NON-HAZARDOUS
4. IGNITION TRANSFORMER IS INSIDE PNL-103 AND MOUNTED ON FLARE.
5. LOCATE FLAME ARRESTER WITH 5 DIAMETERS OF STRAIGHT UNDISTURBED FLOW UPSTREAM.

LEGEND

- FIELD MOUNTED INSTRUMENT
- REMOTE PANEL MOUNTED NORMALLY ACCESSIBLE TO OPERATOR
- LOCAL PANEL MOUNTED NORMALLY ACCESSIBLE TO OPERATOR
- REMOTE SUB-PANEL MOUNTED NORMALLY INACCESSIBLE TO OPERATOR
- LOCAL SUB-PANEL MOUNTED NORMALLY INACCESSIBLE TO OPERATOR
- LOCATED IN THE PLC
- INTERLOCK TO/FROM CONTROL PANEL.
- PIPE & FITTINGS BY OTHERS (NOT BY JOHN ZINK CO.)
- ELECTRICAL INTERCONNECTIONS
- INSTRUMENT CONTROL AIR LINE
- PIPE & FITTINGS BY JOHN ZINK CO.

NO.	REVISION DESCRIPTION	BY	CK.	APP.	DATE

FOR: SUNOCO LOGISTICS
USER: SUNOCO LOGISTICS
JOBSITE: SINKING SPRINGS, PA
S.O. NO. BF-9144980
P.O. NO. D1109261-V2
DR. RPJ DATE: 12-17-13
CK. JPR DATE: 1-3-14
APP. JPR DATE: 1-3-14
DATE:

JOHN ZINK.
JOHN ZINK COMPANY LLC
PARTS AND SERVICE, CALL 1-800-755-4252 FAX (918) 234-1968

PROCESS & INSTRUMENT DIAGRAM
FOR AN ENCLOSED ZTOF PRODUCTION FLARE

CERTIFIED
DRAWING NUMBER D-F-9144980-150
REV. 0
SCALE NONE
1 of 1

File Name: r:\active\p-vapor\9144980\drafting\drawings\401sir0.dwg Plot Date: 11/25/2013 3:39 PM

Enclosed ZTOF Flare Specification Sheets

JOHN ZINK
JOHN ZINK COMPANY LLC

Project Spec Sheet List

Project # 9144980 **Project Site** SUNOCO LOGISTICS

Description 4' X 30' ENCLOSED ZTOF FLARE

Customer SUNOCO LOGISTICS

Location PENNSYLVANIA

Cust. PO # D1109261-V2

Spec	Page	Of	Revision	Description	Spec Name
1	1	4	0	PNL-101	FLARE CONTROL PANEL
1	2	4	0	PNL-101	FLARE CONTROL PANEL
1	3	4	0	PNL-101	FLARE CONTROL PANEL
1	4	4	0	PNL-101	RECEIVER INSTRUMENTS
2	1	1	0	PNL-103	IGNITION TRANSFORMER
3	1	4	0	PCV-302	PRESSURE CONTROL VALVES & REGULATORS
3	2	4	0	SV-303	SOLENOID VALVES
3	3	4	0	HV-304	MANUAL BALL VALVE
3	4	4	0	PI-305	PRESSURE GAGES
4	1	1	0	FA-107	FLASH - BACK ARRESTOR
5	1	1	0	-----	MISCELLANEOUS

JOHN ZINK
JOHN ZINK COMPANY LLC
FOR JZ PARTS: (918)234-2751

JZ SPECIFICATION SHEET
FLARE CONTROL PANEL
PNL-101

Spec	Rev	1	0
Page No.		1 of 4	
Project		9144980	

Project Name: **4' X 30' ENCLOSED ZTOF FLARE**
Customer Name: **SUNOCO LOGISTICS**
Project Site: **SUNOCO LOGISTICS**
Customer P.O.: **D1109261-V2**

	Item No.	Qty	Tag Number(s)	Description	JZ Part No.
1		1 EACH	CE-101	KILLARK #EXB-8106 N34SU2 ENCLOSURE, NEMA 7 HINGED	1083990
2				(10" H X 8" W X 6" D)	
3					
4		1 EACH	-----	KILLARK #7996-2 SUBPANEL	0303521
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

25 **Notes:**

ALL ITEMS REQUIRE UL LABEL

PANEL MOUNT, THEN FLARE MOUNT

	Revision Date	Initials	Revision Description		Date	Name
Δ				Prepared	12/16/2013	ROLFJ
Δ				Checked	01/03/2014	ROLFJ
Δ				Approved	01/03/2014	ROLFJ
Δ				Quote Attached: ☐ Yes	Copies of Vendor Literature Req'd:	1

JOHN ZINK
JOHN ZINK COMPANY LLC
FOR JZ PARTS: (918)234-2751

JZ SPECIFICATION SHEET
FLARE CONTROL PANEL
PNL-101

Spec	Rev	1	0
Page No.		2 of 4	
Project		9144980	

Project Name: **4' X 30' ENCLOSED ZTOF FLARE**
Customer Name: **SUNOCO LOGISTICS**
Project Site: **SUNOCO LOGISTICS**
Customer P.O.: **D1109261-V2**

	Item No.	Qty	Tag Number(s)	Description	JZ Part No.
1		1 EACH	L-1	KILLARK #GOB3-F23C N34 PILOT LIGHT, NEMA 7, 120 V	0550358
2				INCANDESCENT, WHITE LENS	
3		1 EACH	L-5	KILLARK #GOB3-G23C N34 PILOT LIGHT, NEMA 7, 120 V	0400672
4				INCANDESCENT, GREEN LENS	
5		1 EACH	L-6	KILLARK #GOB3-R23C N34 PILOT LIGHT, NEMA 7, 120 V	0023898
6				INCANDESCENT, RED LENS	
7					
8					
9					
10					
11					
12		1 EACH	S-1	KILLARK #GO5-2A3F N34 SELECTOR SWITCH, MAINTAINED	0026360
13				POSITION , NEMA 7, 1-N/O AND 1-N/C CONTACTS	
14					
15		1 EACH	PB-2	KILLARK #GO1-KX3C N34 PUSHBUTTON, MOMENTARY,	1037139
16				NEMA 7, 1-N/O AND 1-N/C CONTACTS	
17					
18					
19					
20					
21					
22					
23					
24					

25 **Notes:**

ALL ITEMS REQUIRE UL LABEL

PANEL MOUNT, THEN FLARE MOUNT

	Revision Date	Initials	Revision Description		Date	Name
Δ				Prepared	12/16/2013	ROLFJ
Δ				Checked	01/03/2014	ROLFJ
Δ				Approved	01/03/2014	ROLFJ
Δ				Quote Attached: ☐ Yes	Copies of Vendor Literature Req'd:	1

JOHN ZINK
JOHN ZINK COMPANY LLC
FOR JZ PARTS: (918)234-2751

JZ SPECIFICATION SHEET
FLARE CONTROL PANEL
PNL-101

Spec	Rev	1	0
Page No.		3 of 4	
Project		9144980	

Project Name: **4' X 30' ENCLOSED ZTOF FLARE**
Customer Name: **SUNOCO LOGISTICS**
Project Site: **SUNOCO LOGISTICS**
Customer P.O.: **D1109261-V2**

	Item No.	Qty	Tag Number(s)	Description	JZ Part No.
1		20 EACH	-----	ENTRELEC #M4/6 TERMINAL (P/N 115 116.07)	0020514
2		2 EACH	-----	ENTRELEC #FEM6 END SECTION (P/N 118 368.16)	0020515
3		2 EACH	-----	ENTRELEC #BAM END STOP (P/N 103 002.26)	0036813
4		1 EACH	-----	ENTRELEC #PR4 RAIL, DIN-3 MOUNT (P/N 101 598.26)	1012629
5		1 EACH	-----	ENTRELEC BLANK MARKING TAG (P/N 233 000.01)	1006764
6		1 EACH	-----	ENTRELEC #BJM6 JUMPER, 10 POINT (P/N 168 973.07)	1019660
7					
8		2 EACH	-----	ENTRELEC #MTC6 TERMINAL (P/N 115 206.22)	1070213
9					
10					
11					
12		1 EACH	CB-2	SQUARE D #60106 CIRCUIT BREAKER, 5 A, ONE POLE	1140428
13					
14		3 EACH	TR-10,14,15	IDEC #GT3A-2AF20 TIMER, 120 V, INSTANT SPDT,	0020413
15				DELAYED SPDT, 0.1 S TO 180 HR ADJUSTABLE RANGE	
16		3 EACH	-----	IDEC #SR2P-06 SOCKET	0030704
17					
18					
19					
20		1 EACH	CR-7	IDEC #RR3B-ULCAC120V RELAY, 3 PDT WITH INDICATING	0401314
21				LIGHT AND PUSH-TO-TEST BUTTON	
22		1 EACH	-----	IDEC #SR3B-05 SOCKET	0030703
23					
24					

25 **Notes:**

ALL ITEMS REQUIRE UL LABEL

PANEL MOUNT, THEN FLARE MOUNT

	Revision Date	Initials	Revision Description		Date	Name
Δ				Prepared	12/16/2013	ROLFJ
Δ				Checked	01/03/2014	ROLFJ
Δ				Approved	01/03/2014	ROLFJ
Δ				Quote Attached: ☐ Yes	Copies of Vendor Literature Req'd:	1

JOHN ZINK
JOHN ZINK COMPANY LLC
FOR JZ PARTS: (918)234-2751

JZ SPECIFICATION SHEET
RECEIVER INSTRUMENTS
PNL-101

Spec	Rev	1	0
Page No.		4 of 4	
Project		9144980	

Project Name: **4' X 30' ENCLOSED ZTOF FLARE**
Project Site: **SUNOCO LOGISTICS**
Customer Name: **SUNOCO LOGISTICS**
Customer P.O.: **D1109261-V2**

GENERAL	1	Service		TEMPERATURE	
	2				
	3	Function		SWITCH	
	4	Case	Color		
	5	Mounting		INTERNAL	
	6				
	7	Enclosure Class		General Purpose	
	8	Power Supply		117 V 60 Hz	
	9	Chart			
	10				
	11	Chart Drive			
	12	Scales			
	13				
CONTROLLER	14	P=Prop(Gain), I=Integral(Auto Reset), D=Derivative(Rate), Sub: s=Slow, f=Fast			
	15	Control Modes			
	16	Action			
	17	Auto-Man Switch			
	18	Set Point Adj.			
	19	Manual Reg.			
	20	Output			
	21				
	22				
	23				
	24				

INPUTS	25	Input Signals		TYPE K THERMOCOUPLE	
	26	No. of Inputs		1	
	27	Power for XMTRS		External	
	28	Transmitter Spec. No.			
	29	Burnout		UPSCALE	
	30				
	31				
	32				
OPTIONS	33	Alarm Switches: Qty	Form	1	
	34	Rating		3 A	
	35	Function		Meas. Var.	
	36	Contact	on Measurement	Open	Increase
	37				
	38				
	39				
	40				
	41				
	42				
ORDER	43	Manufacturer		OMRON	
	44	Model No.		E5C2-R20K	
	45	Tag No.		TSL-307	
	46	Quantity		1 EACH	
	47	Mount		PANEL	
	48	JZ Part No.		0016484	

49 **Notes:**

ALSO SUPPLY OMRON #P2CF-08 BASE
JOHN ZINK PART NUMBER: 0034301
QUANTITY: ONE (1) EACH REQUIRED

ALL ITEMS REQUIRE UL LABEL

	Revision Date	Initials	Revision Description		Date	Name
Δ				Prepared	12/16/2013	ROLFJ
Δ				Checked	01/03/2014	ROLFJ
Δ				Approved	01/03/2014	ROLFJ
Δ				Quote Attached: ☐ Yes	Copies of Vendor Literature Req'd:	1

JOHN ZINK
JOHN ZINK COMPANY LLC
FOR JZ PARTS: (918)234-2751

JZ SPECIFICATION SHEET
IGNITION TRANSFORMER
PNL-103

Spec	Rev	2	0
Page No.		1 of 1	
Project		9144980	

Project Name: **4' X 30' ENCLOSED ZTOF FLARE**
Customer Name: **SUNOCO LOGISTICS**
Project Site: **SUNOCO LOGISTICS**
Customer P.O.: **D1109261-V2**

TRANSFORMER		
1	Manufacturer	DONGAN
2	Model	A06-SA6
3	Tag No.	IT-1
4	Primary	120 V, 60 HZ
5	Secondary	6000 V
6	JZ Part No.	0002558
7		
8		
9		
10		
11		
12		

ENCLOSURE		
13	Manufacturer	KILLARK
14	Model	EXB-8106 N34SU2
15	Enclosure	NEMA 7
16	Dimensions	10" H X 8" W X 6" D
17	JZ Part No.	1083990
18		
19	Sub-Panel Manufacturer	KILLARK
20	Sub-Panel Model No	7996-2
21	JZ Part No.	0303521
22		
23		
24	Mount	BELOW

25 **Notes:**

QUANTITY: ONE (1) EACH ASSEMBLY REQUIRED

ALL ITEMS REQUIRE UL LABEL

PANEL MOUNT, THEN FLARE MOUNT

	Revision Date	Initials	Revision Description
Δ			
Δ			
Δ			
Δ			

	Date	Name
Prepared	12/16/2013	ROLFJ
Checked	01/03/2014	ROLFJ
Approved	01/03/2014	ROLFJ

Quote Attached: ☐ Yes
Copies of Vendor Literature Req'd: 1

JOHN ZINK
JOHN ZINK COMPANY LLC
FOR JZ PARTS: (918)234-2751

JZ SPECIFICATION SHEET
PRESSURE CONTROL VALVES & REGULATORS
PCV-302

Spec	Rev	3	0
Page No.		1 of 4	
Project		9144980	

Project Name: **4' X 30' ENCLOSED ZTOF FLARE**
Project Site: **SUNOCO LOGISTICS**
Customer Name: **SUNOCO LOGISTICS**
Customer P.O.: **D1109261-V2**

LINE	1	Service		PILOT GAS	
	2	Line No./Vessel No.			
	3	Line Size/Sched. No.		1/2"	
	4	Function		REGULATE	
BODY	5	Type of Body		BOLTED	
	6	Body Size	Port Size		1/2"
	7	Guiding	No. of Ports		2
	8	End Conn. & Rating		1/2" NPT	
	9	Body Material		ALUMINUM	
	10	Packing Material			
	11	Lubricator	Isolating Valve		
	12	Seal Type			
	13	Trim Form			
	14	Trim Material			
	15	Seat Material		NITRILE	
	16	Required Seat Tightness			
	17	Max. Allow. Sound Level dBA			
ACTUATOR	18	Type of Actuator		SPRING DIAPHRAGM	
	19	Pilot			
	20	Supply to Pilot			
	21	Self Cont.	Ext. Conn.	X	
	22	Diaphragm Material		NITRILE	
	23	Diaphragm Rating			
	24	Spring Range		0 TO 35 PSIG	
	25	Set Point		15 PSIG	
	26				
	27				

ACCESSORIES	28	Filt. Reg.	Supply Gage	NO	NO
	29	Line Strainer			
	30	Housing Vent			
	31	Internal Relief		NO	
	32				
	33				
	34				
SERVICE	35	Flow Units		SCFH	
	36	Fluid		PROPANE / NATURAL GAS	
	37	Quant. Max		25 / 50	
	38	Quant. Oper.		22 / 45	
	39	Valve Cv	Valve 1	1.33	35.02
	40	Norm. Inlet Press.	ΔP	20 PSIG	
	41	Max. Inlet Press.		400 PSIG	
	42	Max. Shut Off ΔP			
	43	Temp. Max.	Operating	180	60
	44	Oper. sp. gr.	Mol. Wt.	1.52 / 0.65	44 / 19
	45	Oper. Visc.	% Flash		
	46	% Superheat	% Solids		
	47	Vapor Press.	Crit. Press.		
	48	Predicted Sound Level dBA			
ORDER	49				
	50	Manufacturer		FISHER	
	51	Model No.		67D-27	
	52	Mount		PIPE	
	53	Tag No.		PCV-302	
	54	JZ Part No.		1260113	

55 **Notes:**

QUANTITY: ONE (1) EACH REQUIRED

	Revision Date	Initials	Revision Description		Date	Name
Δ				Prepared	12/16/2013	ROLFJ
Δ				Checked	01/03/2014	ROLFJ
Δ				Approved	01/03/2014	ROLFJ
Δ				Quote Attached: ☐ Yes	Copies of Vendor Literature Req'd:	1

JOHN ZINK
JOHN ZINK COMPANY LLC
FOR JZ PARTS: (918)234-2751

JZ SPECIFICATION SHEET
SOLENOID VALVES
SV-303

Spec	Rev	3	0
Page No.		2 of 4	
Project		9144980	

Project Name: **4' X 30' ENCLOSED ZTOF FLARE**
Project Site: **SUNOCO LOGISTICS**
Customer Name: **SUNOCO LOGISTICS**
Customer P.O.: **D1109261-V2**

GENERAL	1	Tag No.		SV-303	
	2	Service		PILOT GAS	
	3				
	4	Line No. / Vessel No.			
	5	Quantity		1 EACH	
VALVE BODY	6	Type			
	7	Size: Body	Port	1/2"	3/4"
	8	Rating	Type Conn.		NPT
	9	Material -- Body		ALUMINUM	
	10	Material -- Seat		NITRILE	
	11	Material -- Diaphragm		NITRILE	
	12	Operation Direct/ Pilot		DIRECT	
	13	Packless or Type Packed		PACKLESS	
	14	Manual Re-Set		NO	
	15	Manual Operator		NO	
	16				
	17				
WHEN DE-ENERGIZED	18	2-Way Valve Opens/Close			CLOSES
	19	3-Way			
	20	Vent Port Opens/Close			
	21	Press Port Opens/Clos			
	22	4-Way			
	23	Press to Cyl.1 / Cyl.2			
	24	Exh. from Cyl.1 / Cyl.2			
	25				
	26				
	27				

SOLENOID	28	Enclosure		NEMA 4,7	
	29	Voltage / HZ		120 V	60
	30	Style of Coil		F	
	31	Single or Double Coil		SINGLE	
	32				
	33				
SERVICE COND.	34	Fluid		PROPANE	NATURAL GAS
	35	Qty. Maximum		25 SCFH	50 SCFH
	36	Oper. Diff. Min / Max		0	20 PSI
	37	Allow. Diff. Min / Max		0	50 PSI
	38	Temp. Norm / Max.	F	60	125
	39	Oper. sp. gr.		1.52	0.65
	40	Oper. Viscosity			
	41	Required Cv			
	42	Valve Cv		4.4	
	43				
	44				
	45				
	46				
	47				
	48				
	49				
	50				
	51	Manufacturer		ASCO	
	52	Model No.		EF8215G20	
	53	Mount		PIPE	
	54	JZ Part No.		0012004	

55 **Notes:**

	Revision Date	Initials	Revision Description
Δ			
Δ			
Δ			
Δ			

	Date	Name
Prepared	12/16/2013	ROLFJ
Checked	01/03/2014	ROLFJ
Approved	01/03/2014	ROLFJ

Quote Attached: ☐ Yes
Copies of Vendor Literature Req'd: 1

JOHN ZINK
JOHN ZINK COMPANY LLC
FOR JZ PARTS: (918)234-2751

JZ SPECIFICATION SHEET
MANUAL BALL VALVE
HV-304

Spec	Rev	3	0
Page No.		3 of 4	
Project		9144980	

Project Name: **4' X 30' ENCLOSED ZTOF FLARE**
Customer Name: **SUNOCO LOGISTICS**
Project Site: **SUNOCO LOGISTICS**
Customer P.O.: **D1109261-V2**

1	Manufacturer	KF CONTROMATICS
2	Model No.	1/2" S8000-SS-M3
3	Process Connections	THREADED
4	Body Material	STAINLESS STEEL
5	Ball Material	316 STAINLESS STEEL
6	Stem Material	316 STAINLESS STEEL
7	Seal/Seat Material	PTFE/PTFE
8	Packing Material	PTFE
9	Handle Type	LEVER
10		
11		
12		

34 **Notes:**

13	Qty	Tag No.	Size	Oper. Press. PSIG	Oper. Temp. °F	Service	Mount	JZ Part No.
14	1 EA	HV-304	1/2"	15	60	PILOT GAS	PIPE	1138982
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								

	Revision Date	Initials	Revision Description		Date	Name
Δ				Prepared	12/16/2013	ROLFJ
Δ				Checked	01/03/2014	ROLFJ
Δ				Approved	01/03/2014	ROLFJ
Δ				Quote Attached: ☐ Yes	Copies of Vendor Literature Req'd:	1

JOHN ZINK
JOHN ZINK COMPANY LLC
FOR JZ PARTS: (918)234-2751

JZ SPECIFICATION SHEET
PRESSURE GAGES
PI-305

Spec	Re	3	0
Page No.		4 of 4	
Project		9144980	

Project Name **4' X 30' ENCLOSED ZTOF FLARE**
Project Site **SUNOCO LOGISTICS**
Customer Name **SUNOCO LOGISTICS**
Customer P.O.: **D1109261-V2**

1	Type		Direct	13	Process Connection	1/2" BOTTOM
2	Mount Type		Local	14	Operating Temperature	60 °F
3	Dial Diamete	Color	4 1/2" WHITE	15	OPTIONS	
4	Case Material		Phenol	16		
5	Ring Type		Screwed	17		
6	Blow-Out Protection		Back	18		
7	Lens Material		Plastic	19		
8	Accuracy Required		+/- 0.5%	20		
9	Element Type		Bourdon	21		
10	Element Materia		SS	22		
11	Socket Material		Steel	23	Manufacturer	WIKA
12	Movement Material		SS	24	Model No.	222.34 4.5 30PSI 1/2L

	Quantity	Tag No	Range PSIG	Oper. Press. PSIG	Service	JZ Part No
25						
26	1 EACH	PI-305	0 TO 30	15	PILOT GAS	1209636
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						

45 **Notes:**

PIPE MOUNT

	Revision Date	Initials	Revision Description		Date	Name
Δ				Prepare	12/16/2013	ROLFJ
Δ				Checked	01/03/2014	ROLFJ
Δ				Approved	01/03/2014	ROLFJ
Δ				Quote Attached: ☐ Yes	Copies of Vendor Literature Req'd:	1

JOHN ZINK
JOHN ZINK COMPANY LLC
FOR JZ PARTS: (918)234-2751

JZ SPECIFICATION SHEET
FLASH - BACK ARRESTOR
FA-107

Spec	Rev	4	0
Page No.		1 of 1	
Project		9144980	

Project Name: **4' X 30' ENCLOSED ZTOF FLARE**
Project Site: **SUNOCO LOGISTICS**
Customer Name: **SUNOCO LOGISTICS**
Customer P.O.: **D1109261-V2**

1	Manufacturer	ENARDO
2	Model No.	E70802/D-AAF-13
3	Process Connections	125 LB FF
4	Body Material	ALUMINUM
5	Element Materia	ALUMINUM
6	Drain Connection	1/2" NPT WITH PLUG
7	Body Configuration	ECCENTRIC
8		
9		
10		
11		
12		

34 **Notes:**

TWO (2) 1/2" FNPT TAPS WITH PLUG REQUIRED, ONE ON EACH SIDE OF ELEMENT.

13	Qty	Tag No.	Size	Oper. Press. H2O	Oper. Temp. °F	Service	Mount	JZ Part No.
14	1 EA	FA-107	2"	15"	100	PRODUCTION VAPOR	FIELD	1164213
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								

	Revision Date	Initials	Revision Description		Date	Name
Δ				Prepared	12/16/2013	ROLFJ
Δ				Checked	01/03/2014	ROLFJ
Δ				Approved	01/03/2014	ROLFJ
Δ				Quote Attached: ☐ Yes	Copies of Vendor Literature Req'd:	1

JOHN ZINK
JOHN ZINK COMPANY LLC
FOR JZ PARTS: (918)234-2751

JZ SPECIFICATION SHEET
MISCELLANEOUS

Spec	Rev	5	0
Page No.		1 of 1	
Project		9144980	

Project Name: **4' X 30' ENCLOSED ZTOF FLARE**
Customer Name: **SUNOCO LOGISTICS**
Project Site: **SUNOCO LOGISTICS**
Customer P.O.: **D1109261-V2**

	Item No.	Qty	Tag Number(s)	Description	JZ Part No.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11	1	10' EACH	-----	DELCO #440 IGNITION WIRE, HIGH VOLTAGE	0002167
12	2	10' EACH	-----	THERMO SENSORS #PPZS16KX THERMOCOUPLE WIRE,	0403529
13				16 GAGE SHIELDED, MOISTURE RESISTANT	
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

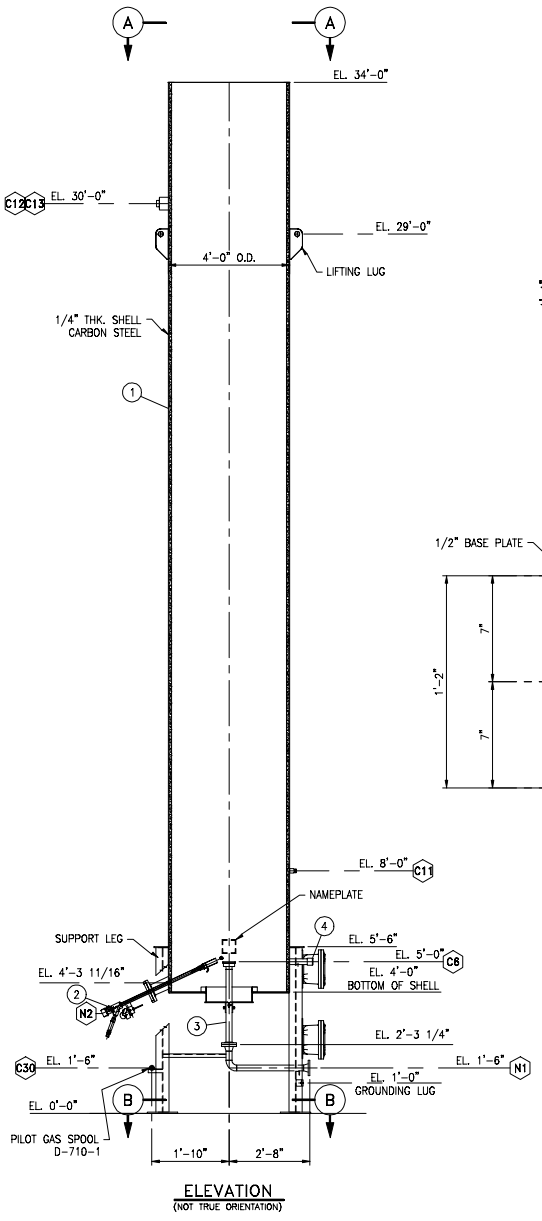
25 **Notes:**

ALL ITEMS REQUIRE UL LABEL

FLARE MOUNT

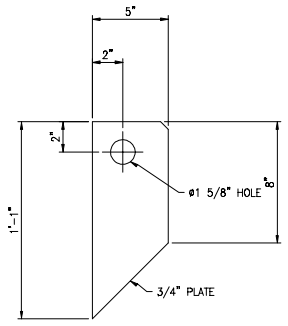
	Revision Date	Initials	Revision Description		Date	Name
Δ				Prepared	01/03/2014	ROLFJ
Δ				Checked	01/03/2014	ROLFJ
Δ				Approved	01/03/2014	ROLFJ
Δ				Quote Attached: ☐ Yes	Copies of Vendor Literature Req'd:	1

Enclosed ZTOF Production Flare Detail

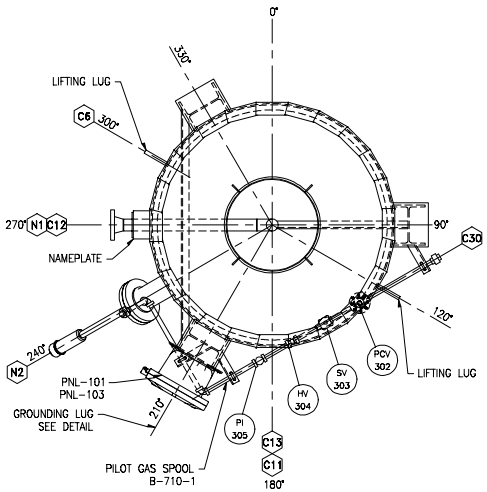


ELEVATION
(NOT TRUE ORIENTATION)

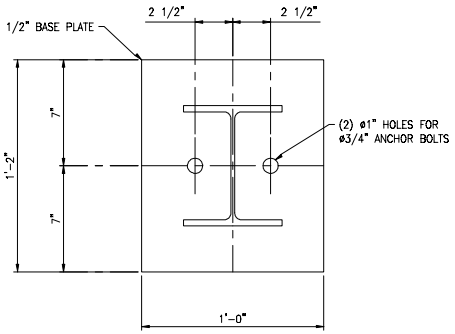
MK: D-701-1



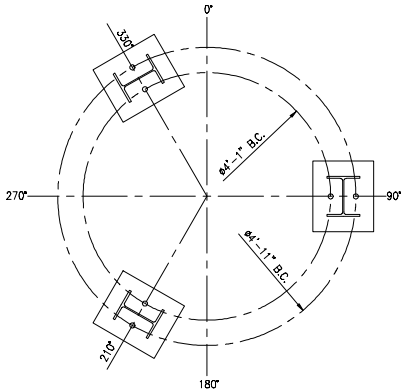
LIFTING LUG DETAIL
TYPICAL TWO PLACES @ 120° AND 300°



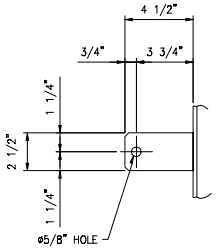
VIEW A-A
(TRUE ORIENTATION)



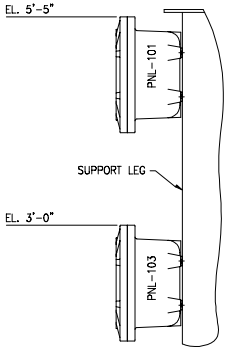
BASE PLATE DETAIL
(TYP 3 PLACES)



SECTION B-B
(TRUE ORIENTATION)



GROUND LUG DETAIL



PANEL DETAIL

PARTS LIST

ITEM	QTY	DESCRIPTION	MK: NO	MATERIAL
1	1	ENCLOSED ZTOF FLARE	D-701-1	
2	1	KE-1D PILOT ASSEMBLY	D-302-1	
3	1	2" FLARE TIP	D-730-1	
4	1	2" SIGHT PORT	CA-ST-0600-1	

NOZZLE LEGEND

MK	QTY	DESCRIPTION
N1	1	GAS CONNECTION: 2" 150# F.F.W.N.
N2	1	PILOT MTG CONN: 4" 150# R.F.S.O
C6	1	SIGHT PORT - 2" MNPT
C11	1	THERMOCOUPLE CONN - 1" FNPT WITH PLUG
C12-13	2	SAMPLE PORT 4" FNPT WITH PLUG
C30	1	PILOT GAS INLET: 1/2" NPT

DESIGN DATA

WINDLOAD (PER ASCE 7-10, EXP. C)	110 M.P.H.
SEISMIC (ASCE 7-05)	SITE CLASS E
SHEAR @ BASE	2,000 LB
MOMENT @ BASE	44,500 LB-FT
DEADLOAD	5,000 LB
SHELL DESIGN TEMPERATURE	500° F
CORROSION ALLOWANCE	0.0

INSULATION LEGEND

A: (1) OVERLAPPING LAYER OF 1" THICK 8 LB DENSITY, 2300° F.

LIFTING NOTES

A: MAIN CRANE AT TOP REQUIRES SPREADER BAR, (NOT SUPPLIED BY JOHN ZINK CO.)
B: LIFTING LUGS DESIGNED FOR 13 1/2 TON CROSBY ANCHOR SHACKLE AND VERTICAL SLINGS.

GENERAL NOTES

1. TAG NUMBERS TO BE PRECEDED BY JOHN ZINK SALES ORDER NUMBER.
2. FLARE ASSEMBLY IS NOT TO BE USED AS AN ANCHOR POINT FOR CUSTOMER PIPING.
3. PRE-TENSION ANCHOR BOLTS BY THE "TURN OF THE NUT" METHOD/AISC.
4. BOLT HOLES TO STRADDLE NORMAL CENTER LINES UNLESS NOTED.
5. FINISH EXTERIOR CARBON STEEL, SUPPORT LEGS, BOTTOM OF FLOOR PLATE, AND MANIFOLD EXTERIOR. SANDBLAST PER SSPC-SP-6 AND PRIME WITH SHERWIN WILLIAMS ZINC CLAD II PLUS #B69VZ12/B69VZ15/B69D11 (3-4 MILS D.F.T.)

NO.	REVISION DESCRIPTION	BY	CK.	APP.	DATE

FOR: SUNOCO LOGISTICS
USER: SUNOCO LOGISTICS
JOBSITE: SINKING SPRINGS, PA.
S.O. NO. BF-9144980
P.O. NO. D1109261-V2
DR. GFG DATE: 12-17-13
CK. GFG DATE: 12-17-13
APP. JPR DATE: 1-3-14
DATE:

JOHN ZINK COMPANY LLC
PARTS AND SERVICE, CALL 1-800-755-4252 FAX (918) 234-1968

ENCLOSED ZTOF PRODUCTION FLARE
4'-0" O.D. x 30' H
(QUANTITY 17)

CERTIFIED

DRAWING NUMBER D-F-9144980-301 REV. 0
SCALE 1 of 1

File Name: r:\active\p-vapor\9144980\drafting\drawings\301s1rC.dwg Plot Date: 1/3/2014 11:14 AM

Manufacturer Recommended Maintenance

JOHN ZINK HAMWORTHY COMBUSTION

RECOMMENDED MAINTENANCE FORM
PRODUCTION FLARE

12/13

SYSTEM COMPONENT	INTERVAL	DATE	INITIALS	COMMENTS
General				
Confirm all covers are secure.	monthly			
Inspect enclosures for moisture.	monthly			
Confirm no gas or liquid leaks exist.	monthly			
Confirm all threaded connections are tight.	annually			
Replace all thermocouples.	annually			
Calibrate instruments and flow meter.	annually			
Flare				
Record flame arrester differential pressure.	monthly			
Inspect exterior paint.	monthly			
Conduct recommended System Testing.	quarterly			
Inspect internal insulation.	quarterly			
Inspect foundation and anchor bolts.	annually			
Clean sight port, flare tip, and flame arrester.	annually			
Conduct emissions performance test.	annually			
Pilot				
Record pilot gas pressure.	monthly			
Inspect mixer for debris or moisture.	monthly			
Clean mixer and orifice.	quarterly			
Clean solenoid.	annually			
Replace electrode.	annually			

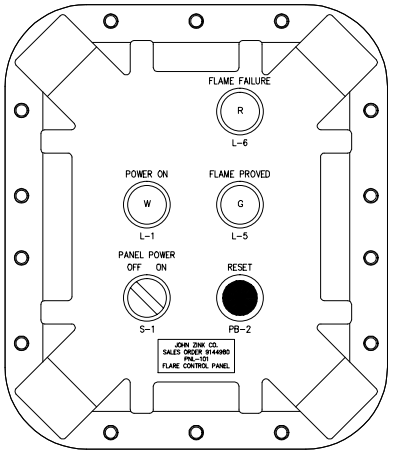
Technical Questions Clarifications

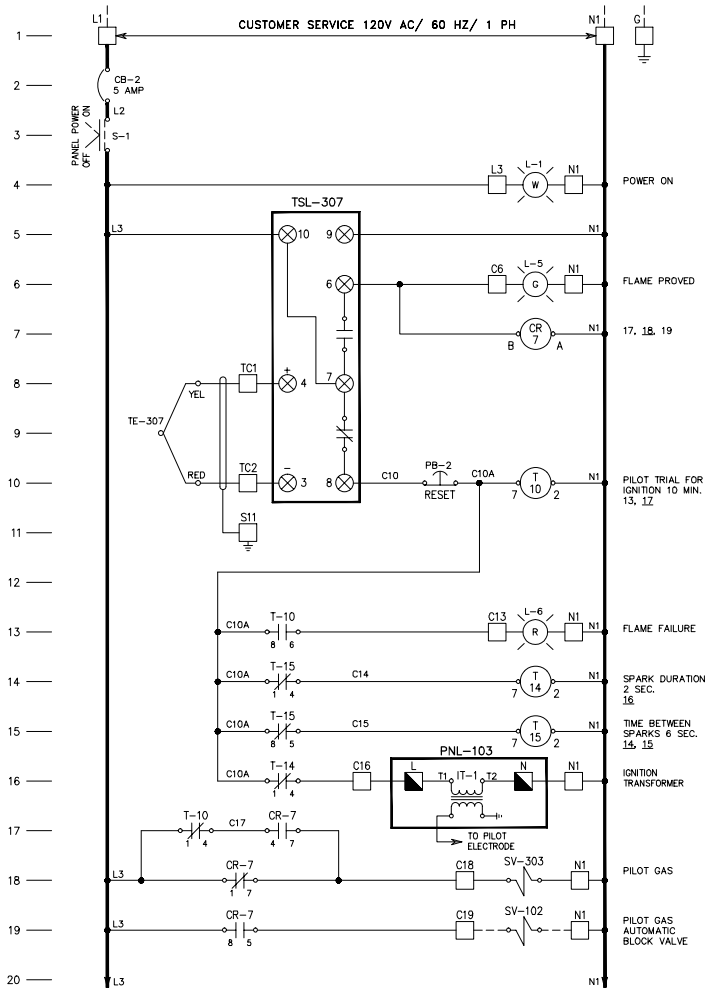
Vendor Proposal Technical and Commercial Questions, Clarifications, and Requests for Information 2

Sunoco Logistics Request for Proposal #:	02896-9001
Vendor:	John Zink
Vendor Proposal #:	BF-201307-37263
Vendor Proposal Date:	August 20, 2013

Technical Question/Clarifications	Vendor Response
1. Can we receive wiring diagrams for the flares? Then we will be able to design our PLC connections.	Drawing submittal is scheduled for January 3, 2014 which will include wiring diagrams of the Flare Control Panel and Ignition Panel.
2. Can we receive piping drawings to show the piping connections with the flares?	Drawing submittal is scheduled for January 3, 2014 which will include a Process and Instrument Diagram, along with general arrangement drawing.
3. We need clarification on the detailed drawing EF1-300-001. Based on the detail drawing it appears that the flare shell enclosure is supported by three support legs that lift the enclosed section 4' above the foundation. Please clarify if the bottom of the shell is closed off or open. If it is closed, we will need to account for uplift.	The bottom of the shell is partially closed, not entirely closed, so "uplift" is insignificant.
4. Can we please receive the manufacturer's recommending maintenance schedule, including tests?	Refer to the separate Recommended Maintenance Form.
5. Can we receive manufacturer's recommended operating specifications, (i.e., flame temperature)?	Pilot Gas Pressure: 10 psig for propane 15 psig for natural gas Pilot Gas Volume: 50,000 BTU/hr Pilot Flame Proved: 200 °F minimum Electricity: 120 V, single phase, 60 Hz

Wiring Diagram for Enclosed ZTOF Flare





NOTES:

1. ALL WIRING TO BE AS FOLLOWS UNLESS INDICATED OTHERWISE:
   WIRE SIZING PER NEC
   MIN. 18 GA./600 V/THHN OR THWN FOR CONTROL
   MIN. 18 GA./TWO CONDUCTOR SHIELDED FOR SIGNAL
2. MINIMUM FIELD CONDUIT REQUIRED:
   (1) THERMOCOUPLES
   (1) POWER – 120 V
3. TERMINAL BLOCKS TO BE ARRANGED IN NUMERICAL ORDER.
4. WIRING LEGEND:
   - ⊗ TERMINAL IN PANEL MOUNTED INSTRUMENTS.
   - □ TERMINAL IN FLARE CONTROL PANEL PNL-101
   - ◪ TERMINAL IN IGNITION PANEL PNL-103
   - ——— WIRING BY JOHN ZINK CO.
   - – – – – – WIRING BY OTHERS (NOT BY JOHN ZINK CO.)
5. ALL WIRING COLORS TO BE AS FOLLOWS UNLESS INDICATED OTHERWISE:

120 V POWER	BLACK
120 V NEUTRAL	WHITE
GROUND	GREEN
24 V DC POWER	BLUE
24 V DC COMMON	YELLOW
SHIELDED ANALOG SIGNAL	BLACK
SHIELDED ANALOG COMMON	WHITE

NO.	REVISION DESCRIPTION	BY	CK.	APP.	DATE

FOR: SUNOCO LOGISTICS
USER: SUNOCO LOGISTICS
JOBSITE: SINKING SPRINGS, PA
S.O. NO. BF-9144980
P.O. NO. D1109261-V2
DR. RPJ DATE: 12-17-13
CK. JPR DATE: 1-3-14
APP. JPR DATE: 1-3-14

JOHN ZINK COMPANY LLC
PARTS AND SERVICE, CALL 1-800-755-4252 FAX (918) 234-1968

WIRING DIAGRAM
FOR AN ENCLOSED ZTOF PRODUCTION FLARE
(QUANTITY 17)

CERTIFIED
DATE:

DRAWING NUMBER D-F-9144980-401
REV. 0
SCALE NONE
1 of 1

File Name: r:\active\jp-wapor\9144980\drafting\drawings\401sir0.dwg Plot Date: 1/3/2014 2:48 PM

Attachment N: Supporting Emissions Calculations

Sunoco Pipeline, L.P.
Follansbee Station
Brooke County, WV
Emission Summary

TETRA TECH

	Uncontrolled - Maximum Short Term Emission Rate (lb/hr)*										
Emission Source Category	**NO_X**	**CO**	**VOC**	**PM**	**PM_{10}**	**SO_X**	**HAP**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
*Flared Emissions***	0.00	0.00	472.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust Emissions	–	–	–	0.34	0.15	–	–	–	--	–	--
Fugitives - Equipment	–	–	0.04	–	–	–	–	–	--	–	--
TOTAL	**0.00**	**0.00**	**472.75**	**0.34**	**0.15**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

	Uncontrolled - Annual Emission Rate (tpy)*										
Emission Source Category	**NO_X**	**CO**	**VOC**	**PM**	**PM_{10}**	**SO_X**	**HAP**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
*Flared Emissions***	0.00	0.00	6.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust Emissions	–	–	–	1.51	0.68	–	–	–	--	–	--
Fugitives - Equipment	–	–	0.19	–	–	–	–	–	--	–	--
TOTAL	**0.00**	**0.00**	**7.00**	**1.51**	**0.68**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

* '–' = Not Applicable
** Note the uncontrolled emission rate assumes that gas discharged from the sources is directly vented to the atmosphere and not controlled by the enclosed flare.

	Controlled - Maximum Short Term Emission Rate (lb/hr)*										
Emission Source Category	**NO_X**	**CO**	**VOC**	**PM**	**PM_{10}**	**SO_X**	**HAP**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Flared Emissions	0.68	3.12	9.48	0.00	0.00	0.03	0.00004	1,434.7	0.07	0.02	1,442.9
Fugitive Dust Emissions	–	–	–	0.14	0.06	–	–	–	--	–	--
Fugitives	–	–	0.04	–	–	–	–	–	--	–	--
TOTAL	**0.68**	**3.12**	**9.53**	**0.14**	**0.06**	**0.03**	**0.00004**	**1,434.7**	**0.07**	**0.02**	**1,442.9**

	Controlled - Annual Emission Rate (tpy)*										
Emission Source Category	**NO_X**	**CO**	**VOC**	**PM**	**PM_{10}**	**SO_X**	**HAP**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Flared Emissions	0.02	0.11	0.26	0.00	0.00	0.002	0.0002	50.2	0.002	0.001	50.5
Fugitive Dust Emissions	–	–	–	0.60	0.27	–	–	–	--	–	--
Fugitives	–	–	0.19	–	–	–	–	–	--	–	--
TOTAL	**0.02**	**0.11**	**0.45**	**0.60**	**0.27**	**0.002**	**0.0002**	**50.2**	**0.002**	**0.001**	**50.5**

* '–' = Not Applicable

Sunoco Pipeline, L.P.
Follansbee Station
Enclosed Flare Emission Calculations

TETRA TECH

Flare Data and Opertating Assumptions: [1-6, 19, 22]

Flare Manufacturer	John Zink Company LLC	
Flare Model	4'Φ x 30' Enclosed ZTOF	
Flare Rating	10	MMBtu/hr
Pilot Gas Flow Rate	50,000	Btu/hr
Pilot Gas Flow Operating Hrs	8,760	hrs/yr
Flare Destruction Efficiency	98.0	%
Gas Chromatograph (GC)		
Flow Rate From Gas Chromatograph (GCs)	0.11	scf/hr-GC
Number of Gas Chromatographs	1	GC(s)
Total Hourly Flow Rate	0.11	scf/hr
GC Operating Hours per Year	8,760	hrs/yr
Relief Valves		
Leak Emission Factor for Relief Valves	0.0001	kg/hr/relief valve
Leak Emission Factor for Relief Valves	0.0003	lb/hr/relief valve
Density of Propane at Atmospheric	0.12	lb/scf
Leak Rate per Relief Valve	0.002	scf/hr-relief valve
Number of Relief Valves	9	relief valves
Total Hourly Flow Rate	0.02	scf/hr
Filters		
Gas Flow Rate per Filter Change	14,106	scf/event-filter
Number of Filters	1	filter(s)
Number of Annual Filter Changes	6	events/yr
Total Annual Volume from Filters	84,638	scf/yr
Provers		
Flow Rate from Prover Event	1,524	scf/event-prover
Number of Provers	1	prover(s)
Number of Prover Maintenance Events	2	events/yr
Total Annual Volume from Provers	3,049	scf/yr
Total Maintenance Emissions		
Maintenance (Short Term)	3,082	scf/hr
Maintenance (Annual)	87,687	scf/yr

Fuel Data: [7]

Fuel Type - Captured Gas to Flare	Butane	
Fuel Type - Pilot Gas	Propane	
Butane Heat Content (LHV)	3,113	Btu/scf
Butane Heat Content (HHV)	0.103	MMBtu/gal
Butane Heat Content (HHV)	3,244	Btu/scf
Butane Volume of Vapor/gallon at 60 °F	31.75	scf/gal
Butane Molecular Weight	58.12	lb/lb-mol
Propane Heat Content (HHV)	2,516	Btu/scf
VOC Content by Weight	100	wt%
Sulfur Content	30	ppm
HAP Content by Weight	0	wt%

Emission Factors: [8-11]

NO_x	0.068	lb/MMBtu	
CO	0.310	lb/MMBtu	
VOC	0.570	lb/MMBtu	
$PM/PM_{10}/PM_{2.5}$	--	lb/MMBtu	
SO_x	9.20E-06	lb/scf	
CO_2 (butane)	64.77	kg/MMBtu	142.79 lb/MMBtu
CO_2 (propane)	61.46	kg/MMBtu	135.49 lb/MMBtu
CH_4	0.003	kg/MMBtu	0.01 lb/MMBtu
N_2O	0.001	kg/MMBtu	0.002 lb/MMBtu

Sunoco Pipeline, L.P.
Follansbee Station
Enclosed Flare Emission Calculations

TETRA TECH

Source Description [18-20]	Maximum Short Term Emission Rate (lb/hr) [12-13, 17, 21]									
	NO_x	CO	VOC	$PM/PM_{10}/PM_{2.5}$	SO_x	HAP	CO_2	CH_4	N_2O	CO_2e
Flare										
Continuous Gas Stream	2.82E-05	1.28E-04	3.92E-04	--	1.18E-06	0.00E+00	5.92E-02	2.74E-06	9.14E-07	5.95E-02
Maintenance Stream	6.80E-01	3.10E+00	9.45E+00	--	2.84E-02	0.00E+00	1.43E+03	6.61E-02	2.20E-02	1.44E+03
Pilot Flame	3.40E-03	1.55E-02	2.85E-02	--	4.69E-04	3.75E-05	6.77E+00	3.31E-04	1.10E-04	6.82E+00
TOTAL [19]	**0.68**	**3.12**	**9.48**	**--**	**0.03**	**0.00004**	**1,434.68**	**0.07**	**0.02**	**1,442.95**

Source Description [18-20]	Annual Emission Rate (tpy) [14-17, 21]									
	NO_x	CO	VOC	$PM/PM_{10}/PM_{2.5}$	SO_x	HAP	CO_2	CH_4	N_2O	CO_2e
Flare										
Continuous Gas Stream	1.23E-04	5.63E-04	1.72E-03	--	5.15E-06	0.00E+00	2.59E-01	1.20E-05	4.00E-06	2.61E-01
Maintenance Stream	9.67E-03	4.41E-02	1.34E-01	--	4.03E-04	0.00E+00	2.03E+01	9.41E-04	3.14E-04	2.04E+01
Pilot Flame	1.49E-02	6.79E-02	1.25E-01	--	2.06E-03	1.64E-04	2.97E+01	1.45E-03	4.83E-04	2.99E+01
TOTAL [19]	**0.02**	**0.11**	**0.26**	**--**	**0.002**	**0.0002**	**50.24**	**0.002**	**0.001**	**50.54**

Notes:

1. The enclosed flare controls the emission streams from the captured gas associated with the gas chromatograph (GC), relief valves, and maintenance operations from the release of gas resulting from the filter cleaning and prover maintenance.
2. Volume of gas directed to flare captured from the gas chromatograph was estimated based on information provided by manufacturer.
3. Volume of gas directed to flare during filter changes was estimated calculated assuming a filter volume of 49.5 cubic feet at 1,460 psig. The volume of gas directed to flare during the prover maintenance was calculated using 5.35 cubic feet at 1,460 psig.
4. Pilot gas volume rate is based on vendor specifications.
5. A destruction efficiency of 98% is used to estimate the emissions based on the manufacturer's design basis.
6. Operational data assumes that gas directed to the flare from the GC(s) and relief valves occurs on a continuous basis. For a conservative annual emission associated with maintenance operation, it is assumed that the filter will be changed 6 times during the first year of operation; prover maintenance will take place twice per year. (Note: the volume of the gas released to the flare during maintenance will be controlled at a rate that will not exceed the maximum capacity of the flare.)
7. Gas heat content (Btu/scf) for butane and propane is based on the higher heating values (HHV) presented in 40 CFR Part 98 Subpart C, Table C-1.
8. Emission factors for NO_X, CO, and VOC are from AP-42 Chapter 13.5 for Industrial Flares, Table 13.5-1 and 13.5-2, April 2015. (Note VOC emision factor is only used to estimate VOC emission from the pilot flame. VOC emissions from the captured gas sent to the flare are based on the flare's destruction efficiency.)
9. PM emissions are assumed to be negligible since the enclosed flare is considered to be 100% smokeless. Additionally it is assumed that all PM would be less that 2.5 microns in diameter; therefore, PM_{10}, and $PM_{2.5}$ would be equivalent to PM.
10. SO_X emission factor is based on the maximum sulfur content and assumes all of the sulfur is converted to SO_2.
11. Emission factors for CO_2, CH_4, and N_2O are from Table C-1 and C-2 of 40 CFR Part 98, Subpart C.
12. Emissions Rate (lb/hr) = $\sum$ Gas Volume from all sources (scf/hr) x Gas Heat Content (HHV) (Btu/scf) x Emission Factor (lb/MMBtu) / 1,000,000 (MMBtu/Btu).
13. VOC/HAP Emission rate for flare gas [VOC/HAP (lb/hr)] =
[Gas Volume (scf/hr)] x [1 (lb-mole) / 379 (scf/lb-mole)] x [Gas MW (lb/lb-mole)] x [VOC/HAP wt%] x [(1 - control efficiency %/100%)].
14. Emissions Rate (tpy) = Emissions Estimate (lb/hr) x Annual Operating Hours (hr/yr) / 2,000 (lbs/ton).
15. Emission Rate for Maintenance Stream (tpy) =
Gas Volume (scf/event) x number of events per year x Gas Heat Content (HHV) (Btu/scf) x Emission Factor (lb/MMBtu) / 1,000,000 (MMBtu/Btu) / 2,000 (lb/ton).
16. VOC Emission Rate for Maintenance Stream (tpy) =
Gas Volume (scf/event) x number of events per year x 1 (lb-mole) / 379 (scf) x Gas MW (lb/lb-mole) x VOC wt% x (1 - Destruction Efficiency % / 100%).
17. CO_2e emission rates use the following carbon equivalence factors: 25 for CH_4, and 298 for N_2O from 40 CFR Part 98, Subpart A, Table A-1.
18. The emissions (scf/hr) from the GC(s) and relief valves are included under "Continuous Gas Stream."
19. The emissions (scf/yr) from the the filter(s) and prover(s) are included under "Maintenance Stream."
20. The calculations include emissions sent to flare from the Gas Chromatograph. Emissions as a result of the gas chromatograph are exempt in accordance with 45CSR13-2.6 specified in Table 45-13B(26) which specifically exempts equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.
21. The Total HAP emission factor for the Propane Pilot Flame was estimated using AP-42, Section 1.4, Table 1.4-3. Emission Factors for Speciated Organic Compounds from Natural Gas Combustion.
22. Leak emission factors for the relief valve emissions routed to the flare are from the USEPA Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November, 1995, Table 2-3. Assume the total organic compound emissions are equivalent to total VOCs.

Sunoco Pipeline, L.P.
Follansbee Station
Enclosed Flare Emission Calculations

TETRA TECH

Filter Calculations: [1-3,5-7]

Elevation	0.00 ft
Atmospheric Pressure at Elevation	14.70 psia
Atmospheric Pressure at Sea Level	14.70 psia
Gauge Pressure in Pipe	1,460 psig
Actual pressure	1,474.70 psia
Pressure in Pipe	100.35 atm
Pressure of Atmosphere at Elevation	1.00 atm
Temperature	40 °F
Volume of Filter	49.48 ft^3
Density at Pipe Pressure [1]	33.73 lb/ft^3
Density at Atmosphere [1]	0.12 lb/ft^3
Volume of Gas at Atmosphere	**14,106.28 ft^3**

Prover Volume Calculations: [1,2,4-7]

Elevation	0.00 ft
Atmospheric Pressure at Elevation	14.70 psia
Atmospheric Pressure at Sea Level	14.70 psia
Gauge Pressure in Pipe	1,460 psig
Actual pressure	1,474.70 psia
Pressure in Pipe	100.35 atm
Pressure of Atmosphere at Elevation	1.00 atm
Temperature	40 °F
Prover Flange Size	10.00 inches
Volume of Prover	5.35 ft^3
Density at Pipe Pressure [1]	33.73 lb/ft^3
Density at Atmosphere [1]	0.12 lb/ft^3
Volume of Gas at Atmosphere	**1,524.44 ft^3**

Notes:

1. Calculations based on the assumption that the facility is at sea level providing conservative estimate.
2. Pressure and temperature of NGL in the pipe are based on the engineering design of the system.
3. Volume for the filter is based on the engineering design of the system.
4. Details for prover based on the information for the FMD-060 Model found on the following internet site:
   http://www.flowmd.com/small-volume-prover-060/
5. The use of propane is to show the highest volume at atmospheric conditions.
6. Density of propane at different pressures was estimated using National Institute of Standards and Technology calculation model to estimate the isothermal properties for propane and various pressures.
   This model can be accessed at the following internet page:
   http://webbook.nist.gov/cgi/fluid.cgi?ID=C74986&TUnit=F&PUnit=atm&DUnit=lbm%2Fft3&HUnit=Btu%2Flbm&WUnit=ft%2Fs&VisUnit=cP&STUnit=lb%2Fft&Type=IsoTherm&RefState=DEF&Action=Page
7. Volume of Gas at Atmospheric Pressure/Temperature (ft^3) =

$$\frac{[\text{Volume of item } (ft^3)] * [\text{Density @ pipeline pressure/temperature } (lb/ft^3)] * [\text{Pressure at sea level elevation (atm)}]}{[\text{Pressure at elevation (atm)}] * [\text{Density @ atmospheric pressure/temperature (lb/ft3)}]}$$

Sunoco Pipeline, L.P.
Follansbee Station
Fugitive Emissions

TETRA TECH

Equipment Type	Equipment Count [1]	Leak Emission Factor [2] (kg/hr/component)	Leak Emission Factor [3] (lb/hr/component)	Emission Rate[4] Total VOC (lb/hr)	Emission Rate[5] Total VOC (lb/yr)	Emission Rate[6] Total VOC (tpy)
Fittings (Connectors and Flanges)	411	8.00E-06	1.76E-05	7.25E-03	63.50	3.17E-02
Valves	234	4.30E-05	9.48E-05	2.22E-02	194.32	9.72E-02
Relief Valves	1	1.30E-04	2.87E-04	2.87E-04	2.51	1.26E-03
Others Components:						
Coriolis Meter	*2*					
Prover	*1*					
Composite Sampler	*2*					
Instruments	*30*					
Total Other Components:	35	1.30E-04	2.87E-04	1.00E-02	87.87	4.39E-02
			TOTAL	0.04	348.20	0.17
			As-Built Contingency	10%	10%	10%
			TOTAL[7,8]	**0.04**	**383.02**	**0.19**

Notes:

1. Equipment counts were based on engineering estimates for the project.
2. Leak emission factors are from the USEPA *Protocol for Equipment Leak Emission Estimates* , EPA-453/R-95-017, November, 1995, Table 2-3. Leak emission factors are for total organic compound emissions from light liquid service for the natural gas liquids (butane). Assume the total organic compound emissions is equivalent to total VOCs.
3. Leak emission factor (lb/hr/component) = Leak emission factors (kg/hr/component) x 1,000 (g/kg) / 453.6 (g/lb).
4. Emission rate (lb/hr) = Emission factor (lb/hr/component) x Equipment Count
5. Emission rate (lb/yr) = Emission factor (lb/hr) x 8,760 (hr/yr)
6. Emission rate (tpy) = Emission rate (lb/hr) x Annual Operating Hours (hr/yr) / 2,000 (lb/ton)
7. A 10% contengency has been included to account for any modifications during the construction phase, for as-built conditions.
8. Fugitives for the propane pilot gas tank are included in the item counts.

Sunoco Pipeline, L.P.
Follansbee Station
Product Analysis Specifications

TETRA TECH

Butane ANALYSIS					
Vapor Component		**Mole %**	**Molecular Weight (lb/lb mole)**	**Molar Mass**	**Weight %**
Nitrogen	N2	0.0	28.02	0.00	0.00
Methane	CH4	0.0	16.04	0.00	0.00
Carbon Dioxide	CO2	0.0	44.01	0.00	0.00
Ethane	C2H6	0.0	30.07	0.00	0.00
Propane	C3H8	2.0	44.10	0.88	1.51
i-Butane	iC4H10	44.0	58.10	25.56	43.67
n-Butane	nC4H10	54.0	58.10	31.37	53.59
i-Pentane	iC5H12	1.0	72.20	0.72	1.23
n-Pentane	nC5H12	0.0	72.20	0.00	0.00
n-Hexane	nC6H14	0.0	86.10	0.00	0.00
Methylcyclopentane	C6H12	0.0	84.16	0.00	0.00
Heptane (C7)	C7H16	0.0	100.20	0.00	0.00
Octane (C8)	C8H18	0.0	114.23	0.00	0.00
Nonane (C9)	C9H20	0.0	128.20	0.00	0.00
Decane (C10)	C10H22	0.0	142.29	0.00	0.00
Tridecane (C13)	C13H28	0.0	184.36	0.00	0.00
Pentadecanes(15)	C15H32	0.0	212.42	0.00	0.00
Nonadecanes(19)	C19H40	0.0	268.52	0.00	0.00
			Total	58.54	100.00
			VOC Wt %		100.00
			HAP Wt %		0.00

Propane ANALYSIS					
Vapor Component		**Mole %**	**Molecular Weight (lb/lb mole)**	**Molar Mass**	**Weight %**
Nitrogen	N2	0.0	28.02	0.00	0.00
Methane	CH4	0.0	16.04	0.00	0.00
Carbon Dioxide	CO2	0.0	44.01	0.00	0.00
Ethane	C2H6	2.0	30.07	0.60	1.35
Propane	C3H8	95.0	44.10	41.90	94.08
i-Butane	iC4H10	3.5	58.10	2.03	4.57
n-Butane	nC4H10	0.0	58.10	0.00	0.00
i-Pentane	iC5H12	0.0	72.20	0.00	0.00
n-Pentane	nC5H12	0.0	72.20	0.00	0.00
n-Hexane	nC6H14	0.0	86.10	0.00	0.00
Methylcyclopentane	C6H12	0.0	84.16	0.00	0.00
Heptane (C7)	C7H16	0.0	100.20	0.00	0.00
Octane (C8)	C8H18	0.0	114.23	0.00	0.00
Nonane (C9)	C9H20	0.0	128.20	0.00	0.00
Decane (C10)	C10H22	0.0	142.29	0.00	0.00
Tridecane (C13)	C13H28	0.0	184.36	0.00	0.00
Pentadecanes(15)	C15H32	0.0	212.42	0.00	0.00
Nonadecanes(19)	C19H40	0.0	268.52	0.00	0.00
			Total	44.53	100.00
			VOC Wt %		98.65
			HAP Wt %		0.00

Sunoco Pipeline, L.P.
Follansbee Station
HAP Emission Factors

TETRA TECH

AP-42, Section 1.4, Tables 1.4-3 and 1.4-4 Emission Factors for Speciated Organic Compounds from Natural Gas Combustion	
Individual HAP	**Emission Factor (lb/MMscf)**
2-Methylnaphthalene	2.40E-05
3-Methylchloranthrene	1.80E-06
7,12-Dimethylbenz(a)anthracene	1.60E-05
Acenaphthene	1.80E-06
Acenaphthylene	1.80E-06
Anthracene	2.40E-06
Benz(a)anthracene	1.80E-06
Benzene	2.10E-03
Benzo(a)pyrene	1.20E-06
Benzo(b)fluoranthene	1.80E-06
Benzo(g,h,i)perylene	1.20E-06
Benzo(k)fluoranthene	1.80E-06
Chrysene	1.80E-06
Dibenzo(a,h)anthracene	1.20E-06
Dichlorobenzene	1.20E-03
Fluoranthene	3.00E-06
Fluorene	2.80E-06
Formaldehyde	7.50E-02
Hexane	1.80E+00
Indeno(1,2,3-cd)pyrene	1.80E-06
Naphthalene	6.10E-04
Phenanathrene	1.70E-05
Pyrene	5.00E-06
Toluene	3.40E-03
Arsenic	2.00E-04
Beryllium	1.20E-05
Cadmium	1.10E-03
Chromium	1.40E-03
Cobalt	8.40E-05
Manganese	3.80E-04
Mercury	2.60E-04
Nickel	2.10E-03
Selenium	2.40E-05
TOTAL	**1.89E+00**
TOTAL (Less HCHO)	**1.81E+00**

Notes:

1. Based on parts per billion by weight (ppbw) in fuel detection limit in Rising et al. 2004.
2. Based on average ppbw in fuel in Rising et al. 2004.
3. 18% of value for chromium.

CALCULATION WORKSHEET

CLIENT Sunoco Pipeline, L.P.		JOB NUMBER 112IC05958/20	
SUBJECT Estimate the amount of particle emissions for the haul road for Follansbee Station WV			
BASED ON SPLP data/WV DAQ Attachment L of NSR Permitting Form		DRAWING NUMBER Not Applicable	
BY AMO'Bradovich	CHECKED BY VJPlachy	APPROVED BY	DATE 10/1/2015

Objective: Estimate the amount of particle emissions associated with the haul road being used for the Follansbee Station as required for Attachment L of the NSR/Title V permit application in WV.

Inputs and Assumptions:

1. Estimated length of road from McAdoo Road into the center of the Facility = 0.73 miles
2. Amount of Truck Travel (VMT/trip) = 2 round trips/day
3. Total Vehicle Round Trips per Hour (trips/hr) = 0.17 trips/hr
4. Total Vehicle Trips per year (VMT/yr) = 1,460 trips/yr
5. Total Vehicle Miles Traveled per Day (VMT/trip) = 1.46 miles/day
6. Total Vehicle Miles Traveled per Year (VMTyr) = 533 miles/year
7. Operating Vechicle Travel hours per year (t) = 8,760 hr/year
8. E (lb/Vehicle Mile Traveled [VMT]) = k × 5.9 × (s ÷ 12) × (S ÷ 30) × (W ÷ 3)^0.7 × (w ÷ 4)^0.5 × ((365 – p) ÷ 365)
   Source: WV DEP Document 2235 Haul Road EUDS: http://www.dep.wv.gov/dag/permitting/Pages/nsr-forms.aspx
   - k = Particle size multiplier
     - for PM = 0.80
     - for PM_{10} = 0.36
   - s = Silt content of road surface material (%) = 10 %
   - S = Mean vehicle speed (mph) = 30 mph
   - W = Mean vehicle weight (tons) = 3.732 tons/vehicle
   - w = Mean number of wheels per vehicle = 4 wheels/vehicle
     Basis: Conservatice assumption-Ford-F250 Super Cab LWB-www.ford.com
   - p = Number of days per year with precipitation = 140 days/year
     Basis: AP-42 Figure 13.2.2-1
9. Control Efficiency = 60 %

Calculations:

1. Estimate the Emission Factor for PM emissions in pounds per Vehicle Mile Traveled ($E\text{-}PM_{VMT}$)

E-PM (lb/VMT) = k × 5.9 × (s ÷ 12) × (S ÷ 30) × (W ÷ 3)^0.7 × (w ÷ 4)^0.5 × ((365 – p) ÷ 365)

$$= \left|0.80\right| \left|5.9\right| \left|\frac{10}{12}\right| \left|\frac{30}{30}\right| \left\|\frac{3.7}{3}\right\|^{0.7} \left\|\frac{4}{4}\right\|^{0.5} \left|\frac{365 - 140}{365}\right|$$

$$= \left|0.80\right| \left|5.9\right| \left|0.8\right| \left|1\right| \left\|1.2\right\| \left\|1\right\| \left\|0.6\right|$$

= 2.83 lb/VMT

2. Determine the amount of Uncontrolled PM Emissions in pounds per hour (pph) and tons per year (tpy).

PM Uncontrolled = E-PM (lb/VMT) * (VMT/trip) * (trips/hr)

$$\text{PM Uncontrolled (lb/hr)} = \left|\frac{2.83 \text{ lb}}{\text{VMT}}\right| \left|\frac{0.7 \text{ VMT}}{\text{trip}}\right| \left|\frac{0.17 \text{ trips}}{\text{hr}}\right| = \boxed{0.34 \text{ lb/hr}}$$

$$\text{PM Uncontrolled (tpy)} = \left|\frac{0.34 \text{ lb}}{\text{hr}}\right| \left|\frac{8{,}760 \text{ hr}}{\text{year}}\right| \left|\frac{1 \text{ ton}}{2{,}000 \text{ lb}}\right| = \boxed{1.51 \text{ tpy}}$$

CALCULATION WORKSHEET

CLIENT	Sunoco Pipeline, L.P.	JOB NUMBER	112IC05958/20
SUBJECT	Estimate the amount of particle emissions for the haul road for Follansbee Station WV		
BASED ON	SPLP data/WV DAQ Attachment L of NSR Permitting Form	DRAWING NUMBER	Not Applicable

BY	CHECKED BY	APPROVED BY	DATE
AMO'Bradovich	VJPlachy		10/1/2015

Calculations (continued):

3. Determine the amount of Controlled PM Emissions in pph and tpy.

PM Controlled = PM Uncontrolled * (1- Control Efficiency)

$$\text{PM Controlled (lb/hr)} = \left| 0.34 \text{ tpy} \right| \left| 1 - \frac{60}{100} \right| = \boxed{0.14 \text{ lb/hr}}$$

$$\text{PM Controlled (tpy)} = \left| 1.51 \text{ tpy} \right| \left| 1 - \frac{60}{100} \right| = \boxed{0.60 \text{ tpy}}$$

4. Estimate the Emission Factor for PM_{10} emissions in pounds per Vehicle Mile Traveled ($E\text{-}PM_{10\_VMT}$)

$$E\text{-}PM_{10} \text{ (lb/VMT)} = k \times 5.9 \times (s \div 12) \times (S \div 30) \times (W \div 3)^{0.7} \times (w \div 4)^{0.5} \times ((365 - p) \div 365)$$

$$= \left| 0.36 \right| \left| 5.9 \right| \left| \frac{10}{12} \right| \left| \frac{30}{30} \right| \left\| \frac{3.7}{3} \right\|^{0.7} \left\| \frac{4}{4} \right\|^{0.5} \left| \frac{365 - 140}{365} \right|$$

$$= \left| 0.36 \right| \left| 5.9 \right| \left| 0.8 \right| \left| 1 \right| \left\| 1.2 \right\| \left\| 1 \right\| \left\| 0.6 \right|$$

$$= 1.27 \text{ lb/VMT}$$

5. Determine the amount of Uncontrolled PM_{10} Emissions in pph and tpy.

PM_{10} Uncontrolled = E-PM (lb/VMT) * (VMT/trip) * (trips/hr)

$$PM_{10} \text{ Uncontrolled (lb/hr)} = \left| \frac{1.27 \text{ lb}}{\text{VMT}} \right| \left| \frac{0.7 \text{ VMT}}{\text{trip}} \right| \left| \frac{0.17 \text{ trips}}{\text{hr}} \right| = \boxed{0.15 \text{ lb/hr}}$$

$$PM_{10} \text{ Uncontrolled (tpy)} = \left| \frac{0.15 \text{ lb}}{\text{hr}} \right| \left| \frac{8{,}760 \text{ hr}}{\text{year}} \right| \left| \frac{1 \text{ ton}}{2{,}000 \text{ lb}} \right| = \boxed{0.68 \text{ tpy}}$$

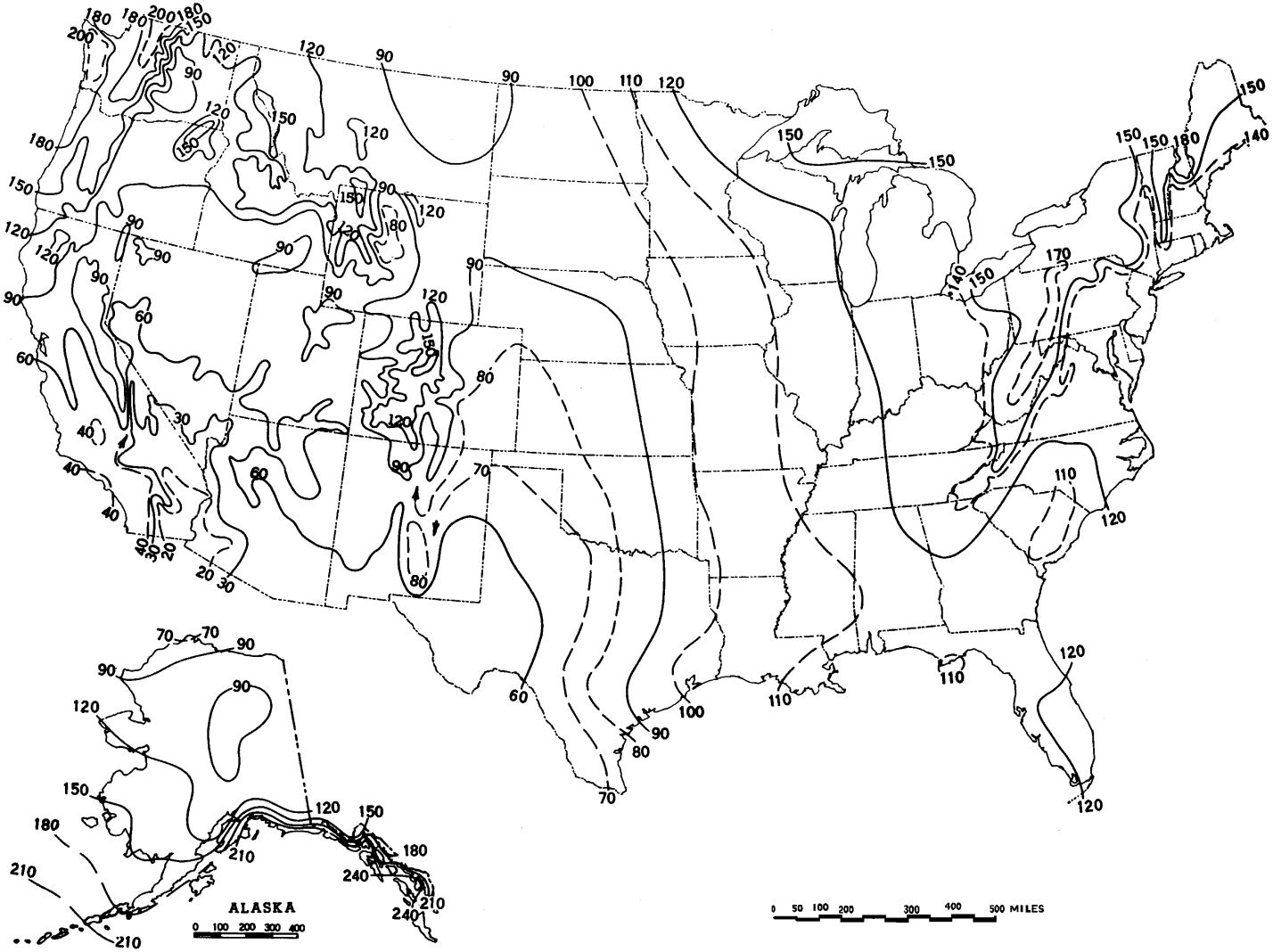
6. Determine the amount of Controlled PM_{10} Emissions in pph and tpy.

PM Controlled = PM Uncontrolled * (1- Control Efficiency)

$$PM_{10} \text{ Controlled (lb/hr)} = \left| 0.15 \text{ tpy} \right| \left| 1 - \frac{60}{100} \right| = \boxed{0.06 \text{ lb/hr}}$$

$$PM_{10} \text{ Controlled (tpy)} = \left| 0.68 \text{ tpy} \right| \left| 1 - \frac{60}{100} \right| = \boxed{0.27 \text{ tpy}}$$

US EPA AP42 Chapter 13.2 Unpaved Roads: Figure 13.2.2-1. Mean number of days with 0.01 inch or more of precipitation in United States.



CALCULATION WORKSHEET

CLIENT SPLP		JOB NUMBER 112IC05958/20	
SUBJECT Estimate the potential Grains of H_2S /100 cubic feet and lb/hr,cf/hr, etc. for Follansbee WV Flare			
BASED ON SPLP data		DRAWING NUMBER Not Applicable	
BY VJPlachy	CHECKED BY AMO'Bradovich	APPROVED BY	DATE 11/2/2015

Objective: Estimate the Quantity of H_2S per 100 cubic feet and pounds per hour from the waste gas to be burned in flare F-9708 and other parameter required for Attachment M of the NSR/Title V permit application in WV.

Inputs and Assumptions:

1. Sulfur content of the butane, propane, and/or ethane is 30 parts per million (ppm)
2. From AP-42 Table 5.3.1: http://www3.epa.gov/ttn/chief/ap42/ch05/final/c05s03.pdf

10,000	ppm H_2S	=	1	mole percent (mole%) H_2S		
627	grains (gr) H_2S/100 scf	=	1	mole percent (mole%) H_2S		

3. Maintenance flow to the flare = 10.01 scf/hr = 87,687 scf/yr
   Maximum pilot gas to the flare = 22.00 scf/hr = 192,720 scf/yr
   Continuous sources to the flare = 0.13 scf/hr = 1,119 scf/yr
   Maximum flow to the flare = 32.14 scf/hr = 281,526 scf/yr
4. molecular weight (MW)
   S = 32.065 lb/lbmole
   H_2S = 34.081 lb/lbmole
5. Maximum hourly short term emission rate = 3,082 scf/hr = 51.4 scf/min
6. Higher Heating Value for stack gas (butane) = 0.103 MMBtu/gal = 3,244 MMBtu/scf
7. 1 lb = 7,000 gr
8. John Zink Average Stack Gas Velocity = 25.388 feet per second (fps) = 1,523 feet per minute (ft/m)

Calculations:

1. Estimate the grains of H_2S per 100 cubic feet of waste gas sent to the flare.

$$= \frac{30.00\ \text{ppm S}}{1} \times \frac{34.081\ \text{lb/lbmole}}{32.065\ \text{lb/lbmole}} \times \frac{1\ \text{mole\% } H_2S}{10{,}000\ \text{ppm } H_2S} \times \frac{627\ \text{gr } H_2S/100\text{scf}}{1\ \text{mole\% } H_2S}$$

$$= 2.00\ \text{gr } H_2S/100\ \text{scf}$$

2. Estimate annual H_2S in the waste gas to the flare in pounds per hour (pph).

$$= \frac{2.00\ \text{gr } H_2S}{100\ \text{scf}} \times \frac{281{,}526\ \text{scf}}{\text{year}} \times \frac{1\ \text{year}}{365\ \text{days}} \times \frac{1\ \text{day}}{24\ \text{hr}} \times \frac{1\ \text{lb}}{7{,}000\ \text{gr}}$$

$$= 0.00009\ \text{lb/hr}$$

3. Estimate the maximum rate during emergency for one major piece of equipment or process unit (Btu/min).

$$= \frac{3{,}082\ \text{scf}}{\text{hr}} \times \frac{3{,}244\ \text{MMBtu}}{\text{scf}} \times \frac{1\ \text{hr}}{60\ \text{min}} \times \frac{1\ \text{Btu}}{1\text{E+06}\ \text{MMBtu}} = 0.17\ \text{Btu/min}$$

Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans

ATTACHMENT O - MONITORING, RECORDING, REPORTING, AND TESTING PLANS

Plan Type	Emission Unit	Pollutant	Requirements	Frequency	Method of Measurement	Regulatory Reference
Recordkeeping	Enclosed Flare (F-9708)	$PM/PM_{2.5}/PM_{10}$ VOC and criteria pollutants	Control of visible particulate emissions Flame presence	Daily Continuous	Visual Supervisory Control and Data Acquisition (SCADA) system	NA NA
Recordkeeping	Fugitive Emissions (FE-01)	VOC	Audible, visual, and olfactory detection ("AVO") methods	Monthly	AVO methods	NA

Attachment P: Public Notice

CERTIFICATE OF PUBLICATION

The Brooke County Review

Brooke County
Wellsburg, West Virginia

I, Jonathan M. McGoldrick, general manager of the Brooke County Review, a newspaper of general circulation in Brooke County, West Virginia, published in Wellsburg, hereby Certify that the attached advertisement was duly published in said Newspaper for 1 successive week(s) in issues of

12/11/15

Given under my hand this 11th day of December 2015

Jonathan M. McGoldrick
General Manager of the Brooke County Review

Printer's Fee $ 73.80

Invoice # 1940

Subscribed and sworn to this 11th day of Dec, 2015

Dorothy Craig
Notary Public

OFFICIAL SEAL
STATE OF WEST VIRGINIA
NOTARY PUBLIC
Dorothy Craig
398 Rose Street
Follansbee, WV 26037
My Commission Expires Mar. 16, 2020

My commission expires March 16, 2020

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Sunoco Pipeline, L.P. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for a Pipeline Station located on 376 White Tail Ridge Rd., Wellsburg, in Brooke County, West Virginia. The latitude and longitude coordinates are: Latitude 40° 14' 8.3364"N, Longitude -80° 32' 36.5922"W.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: 0.45 tons per year (tpy) of Volatile Organic Compounds (VOCs), 0.0002 tpy, Hazardous Air Pollutants (HAPs), 0.02 tpy of Oxides of Nitrogen (NOX), 0.11 tpy of Carbon Monoxide (CO), 50.5 tpy of Carbon Dioxide Equivalent (CO2-e), 0.002 tpy of Oxides of Sulfur, and 0.60 tpy Particulate Matter (PM), and 0.27 tpy PM less than 10 microns (PM10).

Startup of operation is planned to begin on or about the 29 day of September, 2016. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the 11th day of December, 2015.

By: Sunoco Pipeline, L.P.
Matthew L. Gordon
Principle Engineer
535 Fritztown Road
Sinking Spring, PA 19608

BCR 12/11/15

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Dated this the (Day) day of (Month), 2015.

By: Sunoco Pipeline, L.P.
Matthew L. Gordon
Principle Engineer
535 Fritztown Road
Sinking Spring, PA 19608

Attachment Q: Business Confidential Claim – N/A

Attachment R: Authority Forms

Attachment R

AUTHORITY OF LIMITED PARTNERSHIP

TO: West Virginia Department of Environmental Protection, Division of Air Quality

DATE: _____, _____

ATTN: Director

Partnership's Federal Employer I.D. Number 23-3102656

The undersigned hereby files with the West Virginia Department of Environmental Protection, Division of Air Quality, a permit application and hereby certifies that the said name is a trade name which we are using in the conduct of an unincorporated business.

Further, we have agreed or certified as follows:

(1) The undersigned is a general partner and in that capacity may represent the interests of the partnership and may obligate and legally bind all current or future partners and the partnership.

(2) The partnership is authorized to do business in the State of West Virginia.

(3) The name and business address of each general partner:

General Partner: Sunoco Logistics Partners Operations GP LLC

Address: 3807 West Chester Pike

Newtown Square, PA 19073

Telephone No.: 610-859-5754

General Partner: _____

Address: _____

_____

Telephone No.: _____

General Partner: _____

Address: _____

_____

Telephone No.: _____

(4) If any other persons become general partners of the undersigned or our relations as such be altered in any way or if the business should become incorporated, the undersigned will notify you promptly.

Address: 4041 Market Street

Aston, PA 19014-3197

Telephone No.: 610-859-5754

GENERAL PARTNER (Signature)

David R. Chalson

GENERAL PARTNER (Typed)

Sunoco Pipeline, L.P.

LIMITED PARTNERSHIP NAME

Attachment S: Title V Permit Revision Information
(Not Applicable; See Section 3)

APPLICATION FEE