



Karen Irons -MDE- <karen.Irons@maryland.gov>

Accident Title V Operating Permit Renewal Information Request

1 message

Bins, John <JBins@spectraenergy.com>

Thu, Apr 14, 2016 at 2:48 PM

To: "karen.iron@maryland.gov" <karen.iron@maryland.gov>

Cc: "Stallings, Karen F" <KFStallings@spectraenergy.com>, "Rouze, Scott G" <SGRouze@spectraenergy.com>, "Chapa, Carlos A" <CACHapa@spectraenergy.com>, "Goodrich, Barry" <LBGoodrich@spectraenergy.com>, "Mayces, Reagan M" <RMMayces@spectraenergy.com>, "Mehdizadeh, Fariba" <FMehdizadeh@spectraenergy.com>, "Wolfe, Moe" <MEWolfe@spectraenergy.com>, Divya Harrison <DHarrison@trinityconsultants.com>

Karen,

Here is a response to your Aliso Canyon question as we discussed in our conference call this afternoon;

Would you be willing to share basic information about how the Accident facility is different from the Aliso Canyon facility in California?

While Spectra Energy does not comment on the operations or matters of other companies, safety is at the forefront of all we do, and we have a number of monitoring and inspection measures in place to ensure our facilities remain in safe operating condition. These measures include the following:

- Our storage facilities, including the pipelines connected to each well, are regulated at the federal and state level. Spectra Energy engineers, builds, operates and maintains our storage facilities to meet or exceed all federal and state regulations.
- Spectra Energy conducts regular leak surveys, including foot and aerial patrols, at each of our storage facilities. We also regularly upgrade and enhance our facilities to ensure they are equipped with safe and efficient equipment.
- We have a comprehensive integrity management system that includes regular inspections of the wells to identify integrity issues or metal loss, and we undertake repairs before they become an issue to ensure our facilities are in safe operating condition at all times.
- Our inspections include the three primary integrity components: the wellhead, wellbore and cavern or reservoir (or container).
- At our Gas Control centers, highly-trained operators monitor our storage and transmission facilities 24/7 and can remotely close a valve if necessary.

Given this basic operating environment and operating safety culture, the following are some specific differences and safety actions in progress at the Accident Facility:

- Most of our storage wells are engineered in such a way we can inspect the entire vertical depth of the well casing (i.e., production or final cemented casing) with inline inspection tools, or smart pigs, that inspect for any blockages, dents, or corrosion, and verify the thickness of the casing.
- Our understanding is that the Aliso Canyon well could not have been directly inspected due to a small diameter tubing string blocking the path inside the larger tube.

- Over the past 5 years, we have been actively undertaking a facility improvement program to allow for the use of smart pig tools on all wells at the Accident Facility. This program will be completed in 2016.

Sincerely,

John Bins P.E.; Contract Sr. Project Manager

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EHS, Air Quality

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July 26, 2016

Ms. Karen Irons
Air and Radiation Management Administration
Maryland Department of the Environment
1800 Washington Blvd, Suite 720
Baltimore, MD 21230-1720

Subject: Texas Eastern Transmission, LP – Accident Station
Title V Renewal Application – Responses to Questions

Dear Ms. Irons:

Spectra Energy Transmission, LLC (Spectra) is providing this response letter with regard to the recent Title V renewal application for the Texas Eastern Transmission, LP (Texas Eastern) natural gas compression station in Accident, Garrett County, Maryland (Accident Station). During the Title V renewal application process, Spectra received several questions from the Maryland Department of the Environment (MDE) regarding the emissions and operations at the Accident Station. This letter provides our responses to these questions. We have listed below each question/comment received with our response.

MDE Request 1

“The fact sheet for the current Title V operating permit that was issued to Texas Eastern in 2011 contains the following information:

Emission Units: Facility fugitives; pipeline component (F-1)
Miscellaneous Process Vents (F-2)

(As stated in the Title V operating permit fact sheet) Fugitive volatile organic compound (VOC) emissions from the facility consist of leaks from pipeline components and blowdown operations. [List of Sources]

Discharges from these sources are currently unregulated by EPA or the Department. Non-emergency releases pass through the blowdown devices described previously, which remove entrained pipeline liquids from the gas stream.

This information does not appear in the application for the Title V renewal that the Department received in February 2015. Please provide clarification on what is covered under fugitive emissions (emission units MPV, F-1, and F-2) so we can update the Title V permit and fact sheet.”

Response: The Accident Station contains both point sources (i.e., combustion equipment) and fugitive sources (e.g., gas releases, piping components) of air emissions that are covered under the Title V operating permit. All of these sources were included in the recent Title V renewal application. However, Spectra would like to clarify the following with regard to fugitive sources at the Accident Station and

revise the fact sheet accordingly in the renewed permit. The additional categories listed in the fact sheet are the breakdown of these two general categories:

- The F-1 category represents fugitives from blowdown devices and gas releases from the storage field, as well as piping components.
- The F-2/MPV category represents gas releases from the compressor station.

Spectra has historically provided significant and conservative details on potential to emit calculations for both intermittent nonregulated blowdown releases and combustion equipment specific continuous releases. As noted in MDE's request and stated in the Title V operating permit fact sheet, fugitive emissions and blowdown/purging emissions from miscellaneous process vents "are not currently subject to permitting by EPA or the Department as determined by MDE" In addition, the Title V operating permit fact sheet states how "non-emergency releases pass through the blowdown devices, which remove entrained pipeline liquids from the gas stream.

MDE Request 2

"When Texas Eastern submits the annual emissions reports, does the leak emissions number include only station emissions or does it also include storage field emissions? MDE would like to know how piping components and gas releases are calculated and what extent of the station it includes (wells and station)."

Response: The following summarizes the emissions reported in the annual emissions report:

- Gas releases reported in the annual emissions report represent releases occurring at the Accident Station, not the surrounding wellhead locations from the storage field. Sources are almost exclusively blowdowns and purges from units and piping. Releases are tracked internally by Spectra in a gas loss database. Estimated volumes from well maintenance activities including well blowdowns are entered into the gas loss database. Gas release emissions are calculated based on the standard cubic feet of gas released, the site-specific density of the gas, and the site-specific speciation of the gas.
- Piping component emissions are based on component count survey, type of service (gas, light oil, etc.), site-specific speciation for the gas/oil, and EPA leaking emission factors. The component counts represent the Accident Station and storage field wellhead components.

MDE Request 3

MDE requested a map of the wellhead locations around the Accident Station. Attachment 1 contains maps of the wellheads and pipelines for the Accident Station.

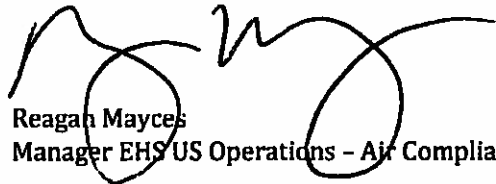
There are a total of 84 wellheads at the Accident Station. The wells average a distance of approximately 1,650 feet from each other. The minimum distance between two wells is approximately 980 feet. As shown in the attachment, the wellheads are generally split into two groups, those west of the station and those east of the station. The eastern group is spaced at an average distance of 1,670 feet from each other, and the western group has an average spacing of 1,630 feet. A table is also included in Attachment 1 with the locations of each wellhead.

Additional Information

Based on conversations with MDE regarding the Title V renewal application and associated air emissions, Spectra conducted a preliminary AERSCREEN analysis of toxic air pollutants (TAPs) from a "typical" wellhead from the Accident Station. This analysis was performed to determine the maximum ambient impacts with regard to TAP emissions at various distances from a typical wellhead. Attachment 2 contains a summary of the analysis conducted and the results. Attachment 3 contains pictures of a wellhead depicting the types of components and sources at a wellhead.

Spectra hopes that this letter addresses the comments and questions raised by MDE during the Title V renewal application process. If you have any questions about this letter, please contact me at (713) 627-4790.

Sincerely,



Reagan Mayces
Manager EHS US Operations - Air Compliance

cc: Mr. John Bins, Spectra Energy Transmission, LLC
Ms. Divya Harrison, Trinity Consultants

ATTACHMENTS

Attachment 1
Accident Storage Well Locations Map

Figure A-2. Well Location Map without Names



Figure A-3. Well Location Map With Pipeline

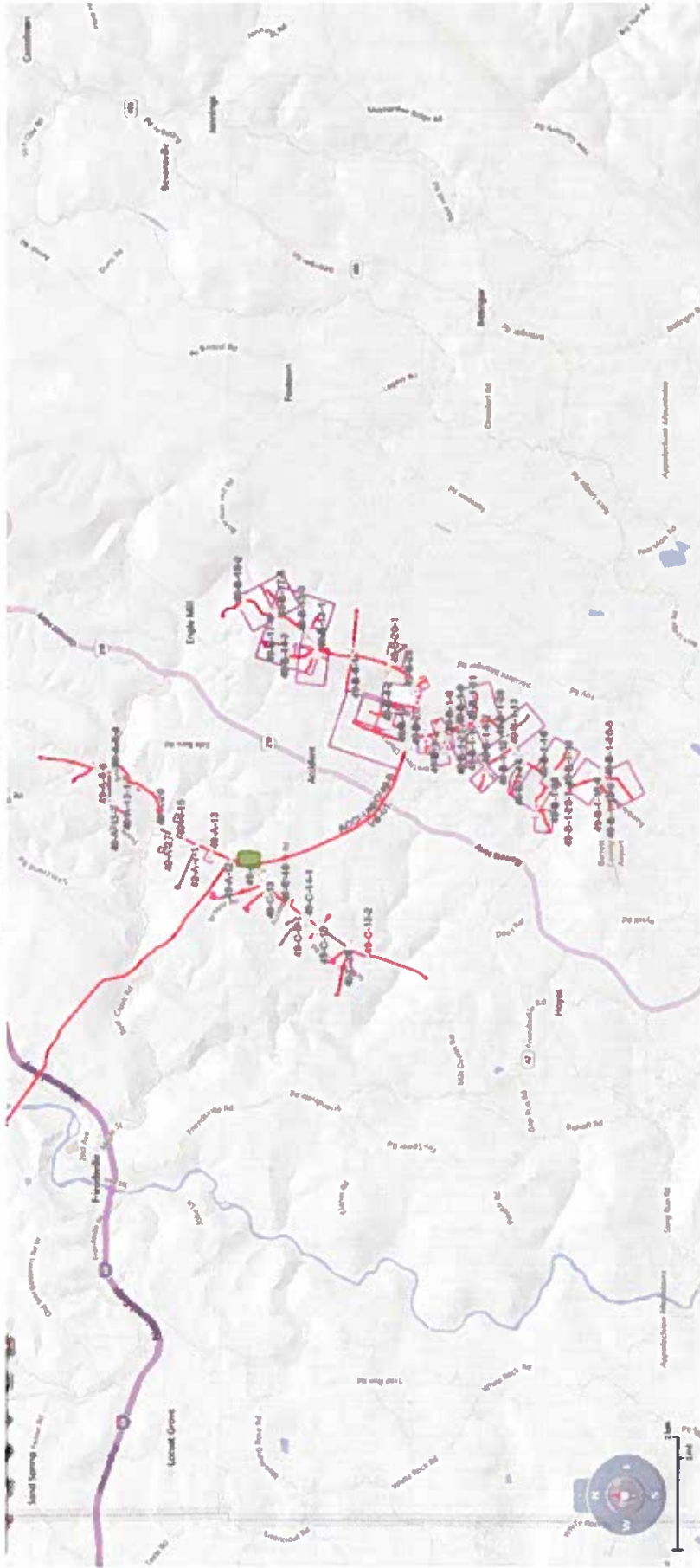


Table A-1. Wellhead Locations Table

Well Name	Short Well Name	Latitude	Longitude
BACH, USA HENRY #1	BACH 1	39.6619384	-79.1793625
BENDER, R. #1	BENDER 1	39.6736188	-79.1181793
BLACK & FRAZEE #1	BLACK & FRAZEE 1	39.6541044	-79.1288949
BLACK & FRAZEE #2	BLACK & FRAZEE 2	39.6504113	-79.3306982
BOWMAN, JOHN #1	BOWMAN 1	39.6264394	-79.3514679
BOWMAN-SEIBERT #1	BOWMAN-SEIBERT 1	39.6294600	-79.3561424
BOWMAN-SEIBERT #2	BOWMAN-SEIBERT 2	39.6335248	-79.3525244
BOWSER, CHARLES #1	C. BOWSER 1	39.6301822	-79.3001796
BOWSER, CHARLES #2	C. BOWSER 2	39.6329351	-79.2967181
BOWSER, F. #1	F. BOWSER 1	39.6367413	-79.2938765
BROBST, C. B. #1	BROBST 1	39.6504989	-79.3458226
BURKHARD-KNOX #1	BURKHARD-KNOX 1	39.6093348	-79.3108818
BURKHARD-KNOX #2	BURKHARD-KNOX 2	39.6056252	-79.3103166
COLLIER, ELLA #1	COLLIER 1	39.6226815	-79.3106654
COLLIER, ELLA #2	COLLIER 2	39.6199839	-79.3083367
DEVINE, A. #1	DEVINE 1	39.6588349	-79.3307421
DOERR, R. #1	DOERR 1	39.6068726	-79.3603585
ENLOW, HELEN #1	ENLOW 1	39.6024240	-79.3118270
ENLOW, HELEN #2	ENLOW 2	39.6043138	-79.3197694
ENLOW, HELEN #3	ENLOW 3	39.5987033	-79.3153257
EVERLY, ELIZABETH #1	EVERLY 1	39.6624134	-79.3240213
EVERLY, ELIZABETH #2	EVERLY 2	39.6618695	-79.3283554
EVERLY, ELIZABETH #3	EVERLY 3	39.6677652	-79.3231814
FIKE, FORD #1	FIKE 1	39.5910017	-79.3340965
FRATZ, W. H. #1	FRATZ 1	39.6237516	-79.3043872
FRAZEE BROS #1	FRAZEE BROS 1	39.6123474	-79.3713485
FRIEND, WOODROW #1	FRIEND 1	39.6576012	-79.3249320
GEORG, A. #1	GEORG 1	39.6107936	-79.3024199
GEORG, A. #2	GEORG 2	39.6131684	-79.3101694
GEORG, A. #3	GEORG 3	39.6141835	-79.2954405
GLOTFELTY, H. #1	GLOTFELTY 1	39.5774638	-79.3268822
HANJUN, HERMAN #1	HANJUN 1	39.6398448	-79.3499648
HANJUN, HERMAN #2	HANJUN 2	39.6342553	-79.3573395
HANJUN, HERMAN #3	HANJUN 3	39.6450701	-79.3474891
HANJUN, HERMAN #4	HANJUN 4	39.6404984	-79.3460939
HANJUN, HERMAN #5	HANJUN 5	39.6398887	-79.3575383
HARMAN, WALTER #1	HARMAN 1	39.6026261	-79.3045851
JENKINS, HAROLD #1	JENKINS 1	39.6496964	-79.3347773
KAHL, ROY #1	KAHL 1	39.5875580	-79.3249328
KAHL, ROY #2	KAHL 2	39.58537	-79.33151
KELSO, W. H. #1	KELSO 1	39.5877794	-79.3164687
KNOX, EARL #1	KNOX 1	39.5947420	-79.3184860
LOKOTOS, MARK #1	LOKOTOS 1	39.6369698	-79.3423648
LOKOTOS, MARK #2	LOKOTOS 2	39.6368704	-79.3458490
MARGROFF, J. W. #1	MARGROFF 1	39.6795942	-79.2958069
MARGROFF, J. W. #2	MARGROFF 2	39.6772204	-79.3084155
MAUST, MARKLE #1	MAUST 1	39.5942683	-79.3094588
MCCULLOUGH, FORD #1	MCCULLOUGH 1	39.6601900	-79.3125121
MCCULLOUGH, FORD #2	MCCULLOUGH 2	39.6641993	-79.3192163
MCCULLOUGH, FORD #3	MCCULLOUGH 3	39.6544808	-79.3340298
MCCULLOUGH, FORD #4	MCCULLOUGH 4	39.6529767	-79.3377454
MILLER, BARBARA #1	B. MILLER 1	39.6076821	-79.3164650
MILLER, BARBARA #2	B. MILLER 2	39.6106220	-79.3166573
MILLER, BARBARA #3	B. MILLER 3	39.6140929	-79.3146943
MILLER, BARBARA #4	B. MILLER 4	39.6093247	-79.3197921
MILLER, HENRY #1	H. MILLER 1	39.6435087	-79.2887014
MILLER, JOHN #1	J. MILLER 1	39.6326883	-79.3479224
REXRODE, C. #1	REXRODE 1	39.5967927	-79.3272991
REXRODE, C. #2	REXRODE 2	39.5931016	-79.3295484
REXRODE, C. #3	REXRODE 3	39.5919572	-79.3239455
RUSH, MITCHELL #1	RUSH 1	39.6228755	-79.3577796
RUSH, MITCHELL #2	RUSH 2	39.6222648	-79.3644240
RUSH, MITCHELL #3	RUSH 3	39.6200847	-79.3600227
RUSH, MITCHELL #4	RUSH 4	39.6268941	-79.3615607
RUSH, MITCHELL #5	RUSH 5	39.6253546	-79.3678156
RUSH, MITCHELL #6	RUSH 6	39.6168143	-79.3623561
SAVAGE RIVER #1	SAVAGE RIVER 1	39.6219720	-79.2871793
SAVAGE RIVER #2	SAVAGE RIVER 2	39.6302833	-79.2915928
SAVAGE RIVER #3	SAVAGE RIVER 3	39.6219757	-79.2967449
SAVAGE RIVER #4	SAVAGE RIVER 4	39.6283442	-79.2887920
SAVAGE RIVER #5	SAVAGE RIVER 5	39.6355993	-79.2890486
SAVAGE RIVER #6	SAVAGE RIVER 6	39.6402556	-79.2858292
SAVAGE RIVER #7	SAVAGE RIVER 7	39.6362855	-79.2829696
SAVAGE RIVER #8	SAVAGE RIVER 8	39.6267604	-79.2958318
SCHLOSSNAGLE, J. #1	SCHLOSSNAGLE 1	39.6167846	-79.3110191
SCHLOSSNAGLE, J. #2	SCHLOSSNAGLE 2	39.6158805	-79.3075457
SMITH, PLAYFORD #1	SMITH 1	39.6010580	-79.3202836
SNEE & EBERLY #1	SNEE & EBERLY 1	39.6294790	-79.3503725
SPEAR, P. B. #1	SPEAR 1	39.6020577	-79.3248778
TURNER, ROY #1	TURNER 1	39.6425136	-79.3401620
TURNER, ROY #2	TURNER 2	39.6458143	-79.3394617
WHITEFACE #1	WHITEFACE 1	39.5804259	-79.3324837
WHITEFACE #2	WHITEFACE 2	39.5755098	-79.3357136
WHITEFACE-KELSO #2	WHITEFACE-KELSO 2	39.5818548	-79.3218565

Attachment 2
Accident Wellhead Modeling

Maryland Toxic Air Pollutant Program

The Accident Station is subject to the standards and requirements under Title 26 of the Code of Maryland Regulations Chapter 11 Sections 15 and 16 (COMAR 26.11.15 and COMAR 26.11.16), which are more commonly known as the Toxic Air Pollutants (TAPs) program. The TAPs regulations were promulgated in September 1988 as a state-only enforceable program. For existing sources (i.e., constructed before July 1, 1988), a TAP is any pollutant listed in COMAR 26.11.16.06 or .07. For new sources (i.e., constructed or reconstructed after July 1, 1988), a TAP is any of the listed pollutants in COMAR 26.11.16.06 and .07 plus any other air pollutant this is considered a health hazard, as defined by the Occupational Safety and Health Administration (OSHA).

As part of the TAPs program, subject facilities are required to demonstrate that emissions of TAPs from their site do not cause off-site concentrations of any TAP to exceed the established allowable ambient level (AAL) for that TAP. This compliance demonstration can be accomplished either by showing potential emissions are below specified small emitter thresholds or allowable emission rates (AERs) or by conducting a screening (using AERSCREEN) or refined air dispersion modeling analysis. Depending on the TAP, there are 1-hour, 8-hour and/or annual AALs. AALs for each TAP are developed by the Maryland Department of the Environment (MDE) based on published concentration thresholds from various other agencies. There are exemptions for certain source types from the TAPs program. For example, fuel burning equipment are exempt from the TAP requirements as specified in COMAR 26.11.15.03B(2)(a).¹

Accident Wellhead TAP Emissions

Spectra has taken the initiative to evaluate TAP emissions from a "typical" wellhead in order to determine the maximum impact near a wellhead with regard to the TAPs standards and program. There are 84 wellheads throughout the Accident Storage Field. At each wellhead, there are typically two sources of air emissions: 1) fugitive emissions from component leaks, and 2) point source emissions from a triethylene glycol (TEG) heater.² The types of components at a wellhead include connectors and valves. In order to develop a worst-case air emissions scenario, a typical wellhead was developed for this analysis based on the maximum component count for any type of a component throughout the 84 wellheads and the use of one TEG heater at a wellhead.

Fugitive emissions from component leaks were calculated based on the maximum number of components of each type (e.g., valve, connector), the material (natural gas.) and the speciation of TAPs in the natural gas, whether the material is a gas or liquid when passing through/by the component, and EPA-published emission factors. Emission factors from Table 2-4 of EPA's *Protocol for Equipment Leak Emission Estimates* were used.³ Emissions from the TEG heater were based on U.S. EPA's published emissions factors from AP-42 Section 1.5 *Liquefied Petroleum Gas Combustion* for criteria pollutants and Section 1.4 *Natural Gas Combustion* for the key TAPs of concern (benzene, formaldehyde, hexane, naphthalene, and toluene).⁴ Emissions from the typical wellhead do not include emissions associated with releases from the wellheads or maintenance activities (e.g., methanol injection).

¹ Note the exemption in COMAR 26.11.15.03B(2)(a) specifically refers to a "fuel burning equipment" definition in COMAR 26.11.09.01. It should be noted that COMAR 26.11.09.01 no longer includes a definition of "fuel burning equipment" as such the definitions in the general provisions have been used in this assessment. COMAR 26.11.01.01B(17) "Fuel-burning equipment" means any: (a) Boiler that has the primary function of heating air, water, or any other medium through indirect heat transfer from the burning of fuels; or (b) Stationary internal combustion engine or stationary combustion turbine used to produce mechanical or electrical energy."

² Note that not every wellhead has a TEG heater. However, emissions from a TEG heater were included in this analysis to be conservative in estimating emissions from a typical wellhead.

³ EPA, *Protocol for Equipment Leak Emission Estimates*, EPA-453/R-95-017, November 1995.

⁴ Spectra included TAP emissions from the TEG heater using U.S. EPA natural gas combustion emission factors as a conservative measure since there are no published TAP emission factors in U.S. EPA's AP-42 Section 1.5 for liquefied petroleum gas combustion.

AERSCREEN Modeling

An air dispersion modeling analysis was performed using U.S. EPA's AERSCREEN model with a unit emission rate (1 gram per second) for the following TAPs:

- > Benzene
- > Ethylbenzene
- > Formaldehyde
- > Hexane
- > Naphthalene
- > Toluene
- > Xylene

Two analyses were conducted to determine maximum ambient impacts from a typical wellhead at distances varying from 5 meters out to 800 meters. The first analysis modeled the fugitive air emissions from component leaks and the second analysis modeled air emissions from a TEG heater. The modeled ambient impacts from each analysis were scaled based on the emission rate for each TAP and then the results from the two analyses were combined to determine the maximum ambient impact from a typical wellhead. The following table summarizes the results from the analyses showing the maximum combined ambient impact at 5 meters compared to MDE's AALs.

Table B-1. AERSCREEN Results Summary Table

TAP	Fugitive Emission Rate (lb/hr)	TEG Emission Rate (lb/hr)	Averaging Period	Standard ⁵ (µg/m ³)	Total Modeled Impact (µg/m ³)	Below Standard? Yes/No
Benzene	9.4E-6	3.2E-8	1-hour	79.9	0.3	Yes
	9.4E-6	3.2E-8	8-hour	16.0	0.3	Yes
	7.9E-6	2.7E-8	Annual	0.78	0.03	Yes
Ethylbenzene	6.0E-7	N/A	8-hour	868.4	0.02	Yes
Formaldehyde	N/A	1.1E-6	8-hour	20.3	0.1	Yes
	N/A	9.5E-7	Annual	0.48	0.01	Yes
Hexane	1.3E-4	2.7E-5	1-hour	35,247.4	8.1	Yes
	1.3E-4	2.7E-5	8-hour	1,762.4	7.3	Yes
Naphthalene	7.3E-7	9.3E-9	1-hour	786.4	0.03	Yes
	7.3E-7	9.3E-9	8-hour	524.3	0.02	Yes
Toluene	9.4E-6	5.2E-8	8-hour	753.6	0.3	Yes
Xylene	3.0E-6	N/A	1-hour	6,512.9	0.1	Yes
	3.0E-6	N/A	8-hour	4,341.9	0.1	Yes

Results from the AERSCREEN modeling analysis for benzene, ethylbenzene, formaldehyde, hexane, naphthalene, toluene, and xylene showed the ambient air levels of these pollutants are well below their AALs for all applicable averaging periods (1-hour, 8-hour, and annual) at 5 meters and beyond a typical wellhead. As such, Spectra has demonstrated that TAP emissions from a typical wellhead will not adversely impact public health.

⁵ Ambient air standards listed in the table are based on MDE's standards for existing sources (i.e., if the standard was recently revised, it is not reflected in this analysis as there have been no changes at the Accident Station requiring it to demonstrate compliance with the newer standard).

Wellhead Results

AERSCREEN 15181 / AERMOD 15181

06/03/16
14:40:00

TITLE: SPECTRA ACCIDENT WELLHEAD

***** VOLUME PARAMETERS *****

SOURCE EMISSION RATE: 1.0000 g/s 7.937 lb/hr
VOLUME HEIGHT: 1.00 meters 3.28 feet
INITIAL LATERAL DIMENSION: 0.23 meters 0.76 feet
INITIAL VERTICAL DIMENSION: 0.93 meters 3.05 feet
RURAL OR URBAN: RURAL
INITIAL PROBE DISTANCE = 800. meters 2625. feet

***** BUILDING DOWNWASH PARAMETERS *****

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

***** PROBE ANALYSIS *****
25 meter receptor spacing: 5. meters - 800. meters

Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	0.030	0.2841E+06	5.0	SPR

* = worst case flow sector

***** MAKEMET METEOROLOGY PARAMETERS *****

MIN/MAX TEMPERATURE: 270.0 / 300.0 (K)
MINIMUM WIND SPEED: 0.5 m/s
ANEMOMETER HEIGHT: 10.000 meters
SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES
DOMINANT SURFACE PROFILE: Cultivated Land
DOMINANT CLIMATE TYPE: Average Moisture
DOMINANT SEASON: Spring
ALBEDO: 0.14
BOWEN RATIO: 0.30
ROUGHNESS LENGTH: 0.030 (meters)

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

wellhead Results

YR MO DY JDY HR
 10 01 01 1 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF	WS
-0.30	0.017	-9.000	0.020	-999.	5.	1.4	0.030	0.30	0.30	0.14	0.50	
HT	REF	TA	HT									
10.0	270.0	2.0										

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR
 10 01 01 1 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF	WS
-0.30	0.017	-9.000	0.020	-999.	5.	1.4	0.030	0.30	0.30	0.14	0.50	
HT	REF	TA	HT									
10.0	270.0	2.0										

***** AERSCREEN AUTOMATED DISTANCES *****
 OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
5.00	0.2841E+06	375.00	0.1057E+05
15.24	0.1304E+06	400.00	9888.
25.00	0.9201E+05	425.00	9276.
30.48	0.7999E+05	450.00	8726.
50.00	0.5620E+05	475.00	8231.
60.96	0.4869E+05	500.00	7781.
75.00	0.4188E+05	525.00	7373.
100.00	0.3379E+05	550.00	6999.
125.00	0.2843E+05	575.00	6658.
150.00	0.2456E+05	600.00	6343.
152.40	0.2424E+05	625.00	6053.
175.00	0.2160E+05	650.00	5786.
200.00	0.1924E+05	675.00	5538.
225.00	0.1733E+05	700.00	5307.
250.00	0.1573E+05	725.00	5092.
275.00	0.1438E+05	750.00	4892.
300.00	0.1323E+05	775.00	4705.
304.80	0.1302E+05	786.38	4624.
325.00	0.1222E+05	800.00	4530.
350.00	0.1135E+05		

wellhead Results

***** AERSCREEN MAXIMUM IMPACT SUMMARY *****

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	0.2841E+06	0.2841E+06	0.2557E+06	0.1705E+06	0.2841E+05

DISTANCE FROM SOURCE 5.00 meters

IMPACT AT THE AMBIENT BOUNDARY	0.2841E+06	0.2841E+06	0.2557E+06	0.1705E+06	0.2841E+05
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DISTANCE FROM SOURCE 5.00 meters

TEG Heater results

AERSCREEN 15181 / AERMOD 15181

06/03/16
14:38:33

TITLE: SPECTRA ACCIDENT TEG HEATER

***** STACK PARAMETERS *****

SOURCE EMISSION RATE: 1.0000 g/s 7.937 lb/hr
STACK HEIGHT: 0.60 meters 1.97 feet
STACK INNER DIAMETER: 0.112 meters 4.40 inches
PLUME EXIT TEMPERATURE: 366.5 K 200.0 Deg F
PLUME EXIT VELOCITY: 0.001 m/s 0.00 ft/s
STACK AIR FLOW RATE: 0 ACFM
RURAL OR URBAN: RURAL
INITIAL PROBE DISTANCE = 800. meters 2625. feet

***** BUILDING DOWNWASH PARAMETERS *****

NO BUILDING DOWNWASH HAS BEEN REQUESTED FOR THIS ANALYSIS

***** PROBE ANALYSIS *****

25 meter receptor spacing: 5. meters - 800. meters

Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	0.010	0.1008E+07	5.0	WIN

* = worst case flow sector

***** MAKEMET METEOROLOGY PARAMETERS *****

MIN/MAX TEMPERATURE: 270.0 / 300.0 (K)
MINIMUM WIND SPEED: 0.5 m/s
ANEMOMETER HEIGHT: 10.000 meters
SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES
DOMINANT SURFACE PROFILE: Cultivated Land
DOMINANT CLIMATE TYPE: Average Moisture
DOMINANT SEASON: Winter
ALBEDO: 0.60
BOWEN RATIO: 1.50
ROUGHNESS LENGTH: 0.010 (meters)

TEG Heater results
 METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR
 -- -- -- -- --
 10 03 11 11 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-0.26	0.050	-9.000	0.020	-999.	25.	42.7	0.010	1.50	0.60	1.00

HT	REF TA	HT
10.0	300.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 0.7 m/s
 STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 0.3 meters
 ESTIMATED FINAL PLUME RISE (non-downwash): 0.0 meters
 ESTIMATED FINAL PLUME HEIGHT (non-downwash): 0.3 meters

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR
 -- -- -- -- --
 10 03 11 11 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-0.26	0.050	-9.000	0.020	-999.	25.	42.7	0.010	1.50	0.60	1.00

HT	REF TA	HT
10.0	300.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 0.7 m/s
 STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 0.3 meters
 ESTIMATED FINAL PLUME RISE (non-downwash): 0.0 meters
 ESTIMATED FINAL PLUME HEIGHT (non-downwash): 0.3 meters

***** AERSCREEN AUTOMATED DISTANCES *****
 OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

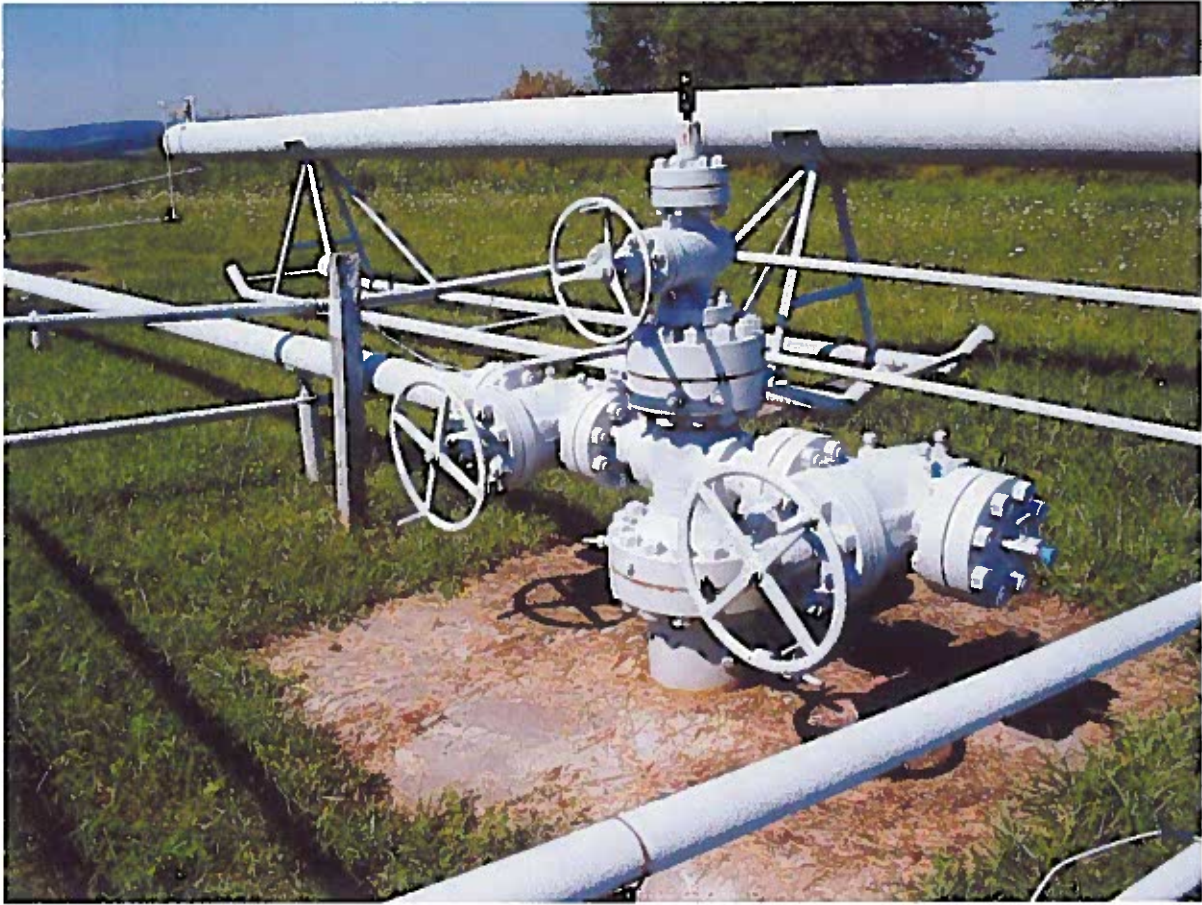
DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
5.00	0.1008E+07	375.00	0.1772E+05
15.24	0.5664E+06	400.00	0.1624E+05
25.00	0.4199E+06	425.00	0.1496E+05
30.48	0.3643E+06	450.00	0.1384E+05
50.00	0.2272E+06	475.00	0.1286E+05
60.96	0.1823E+06	500.00	0.1200E+05
75.00	0.1430E+06	525.00	0.1123E+05
100.00	0.1005E+06	550.00	0.1054E+05
125.00	0.7577E+05	575.00	9917.
150.00	0.5989E+05	600.00	9357.

TEG Heater results					
152.40	0.5867E+05		625.00		8849.
175.00	0.4897E+05		650.00		8387.
200.00	0.4108E+05		675.00		7965.
225.00	0.3515E+05		700.00		7578.
250.00	0.3055E+05		725.00		7222.
275.00	0.2689E+05		750.00		6893.
300.00	0.2393E+05		775.00		6590.
304.80	0.2343E+05		786.38		6459.
325.00	0.2149E+05		800.00		6309.
350.00	0.1945E+05				

***** AERSCREEN MAXIMUM IMPACT SUMMARY *****

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	0.1008E+07	0.1008E+07	0.9075E+06	0.6050E+06	0.1008E+06
DISTANCE FROM SOURCE	5.00 meters				
IMPACT AT THE AMBIENT BOUNDARY	0.1008E+07	0.1008E+07	0.9075E+06	0.6050E+06	0.1008E+06
DISTANCE FROM SOURCE	5.00 meters				

Attachment 3
Typical Wellhead Pictures





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Houston, TX 77056-5310
713 627.5400 main

Mailing Address
P O. Box 1642
Houston, TX 77251-1642



August 31, 2016

Ms. Karen Irons
Air and Radiation Management Administration
Maryland Department of the Environment
1800 Washington Blvd, Suite 720
Baltimore, MD 21230-1720

Subject: Texas Eastern Transmission, LP – Accident Station
Title V Renewal Application – Responses to Questions

Dear Ms. Irons:

Spectra Energy Transmission, LLC (Spectra) is providing this response letter with regard to the recent Title V renewal application for the Texas Eastern Transmission, LP (Texas Eastern) natural gas compression station in Accident, Garrett County, Maryland (Accident Station). During the Title V renewal application process, Spectra received several follow-up questions from the Maryland Department of the Environment (MDE) regarding the emissions and operations at the Accident Station. This letter provides our responses to these questions. We have listed below each question/comment received with our response.

MDE Question 1

"The Department is still unclear on what fugitive emissions are included as F-1 and which are included as F-2/MPV. Also it is unclear as to what fugitive emissions are included in the annual emission certification statements. Attached is a table to complete in order to add some clarification. The table has a list of fugitive emissions sources and where there are located. Complete the table by identifying the sources as F-1 or F-2/MPV and confirm whether or not the sources are included in the annual emissions certifications. If there are fugitive emission sources not included in the Table, please add the missing sources.

The Department's understanding is that MPV stands for miscellaneous process vents and the vents are all located at the compressor station. If this is in error, please clarify."

Response: MDE's understanding of the MPV category is correct. They are for the miscellaneous process vents associated with the compressor station. There are no leak emissions associated with the MPV sources, only gas releases from the station.

With regard to the various fugitive emission categories at the station and storage field, please see the attached table with Spectra's edits and additions. In particular, Spectra would like to propose to remove the existing categories in the Title V operating permit (F1, F2/MPV) and redefine the fugitive categories into the following four separate categories going forward under the Title V operating permit.

- Facility Gas Releases
- Facility Pipeline Component Fugitives
- Storage Field Gas Releases

- Storage Field Pipeline Component Fugitives

The four distinct categories would help to make clear what emissions belong to each fugitive source group. Emissions from the wellheads at the storage field would be kept separate from the emissions at the compressor station since they are tracked separately in Spectra's databases. Furthermore, emissions from piping components would be kept separate from emissions from gas releases, which is consistent with other Texas Eastern/Spectra facilities.

MDE Question 2

"Please either confirm that the following description of fugitive emissions is correct or provide the necessary corrections and updates:

Fugitive emissions consist of leaks from pipeline components and gas releases from blowdowns and purges-operations. Permanently located in compressor station yards are a set of blowdown devices and miscellaneous process vents. Various sources in the station yard are manifolded to these devices that occasionally release gas as part of the normal operating procedure and for safety and maintenance reasons. These sources include but are not limited to compressor case vents, valve operator vents and pig launcher and receiver vents. The blowdown devices receive gas from these sources prior to being released to atmosphere and remove free liquids from the stream. The liquid removal efficiency of these devices is considered to be greater than 95 percent. Liquids are not retained in these devices; rather they are piped directly to a pipeline condensate tank located at the station site. The blowdown devices vent gas to atmosphere. In the event of an emergency shutdown, gas releases directly to the atmosphere instead of being routed to the blowdown devices. Purges include air purges and pipeline liquids purges, which use natural gas as the purging volume. Leaks from piping components consist of leaks from valves, connectors, flanges, open ended lines, pump seals, and other components. In the initial permit, facility fugitives were lumped into an emission point F-1 described as facility fugitives from blowdown devices and pipe components consisting of 287 valves, 835 flanges, 59 screwed fittings, 7 blowdown valves, 15 pressure relief valves, 16 compressor seals. The vast majority of the estimated emissions from piping component leaks actually occur on property adjacent to the Accident compressor station. These leaks are from the network of piping that connects the storage wells to the compressor station."

Response: Spectra has reviewed MDE's description above taken from the previous Title V operating permit fact sheet. Please refer to the modifications made in red text and strikethrough above.

MDE Question 3

"Please either confirm that the following description of fugitive emissions is correct or provide the necessary corrections and updates:

~~*Emission Units: F-1 (Facility fugitives, blow-downs and pipeline component), MPV (Miscellaneous Process Vents), and F-2 (Group designation for multiple emission points throughout the facility)*~~
Facility Gas Releases, Facility Pipeline Component Fugitives, Storage Field Gas Releases, and Storage Field Pipeline Component Fugitives

Fugitive volatile organic compound (VOC) emissions from the facility and storage field consist of leaks from pipeline components and gas releases from blowdowns and purges. Blowdowns include, but are not limited to, station blowdown, case venting, and ancillary equipment (emergency

generator, fuel gas heater, blowdown of fuel lines and/or equipment, etc.). Purges include air purges and pipeline liquids purges, which use natural gas as the purging volume. Piping components consist of valves, connectors, flanges, open ended lines, pump seals, and other components. Blow-down operations include the following categories of activities:

~~V1-921 — Compressor blow-downs/purges~~
~~V2-921 — Dehydration distillate and blowdown~~
~~V4S-921 ESD — Shaffer operators 16" line. Shaffer operators for second cut regulator vents~~
~~V4D-921 — Shaffer valve operator vents~~
~~V1-308 — Compressor blow-downs/purges~~
~~V1B-102 — Compressor blow-downs/purges~~
~~V2-322 — Salt water, methanol and possibly distillate diffuser~~
~~V2C — Blow-down for packing drains~~

~~Non-emergency releases pass through the blowdown devices described previously, which remove entrained pipeline liquids from the gas steam. The Company states that liquid removal efficiency of these devices is considered to be greater than 95 percent.~~

Response: Spectra has reviewed MDE's description above taken from the previous Title V operating permit fact sheet. Please refer to the modifications made in red text and strikethrough above.

MDE Question 4

"Please provide the calculations that form the basis of the GHG emissions that are included in your annual emissions certification."

Response: Greenhouse gas (GHG) emissions are calculated separately for combustion sources and fugitive sources. GHG emissions from combustion sources are quantified utilizing the formula provided below:

$$\text{GHG} = \text{EF} \times \text{HHV} \times \text{Gas Usage} \times 2.2046 / 2000$$

With:

GHG = Emissions of GHG pollutant (CO₂, CH₄, N₂O) (tpy)

EF = Emission factor for pollutant in kg/MMBtu, from 40 CFR 98 Subpart C, Tables C-1 and C-2

HHV = High heating value for natural gas from 40 CFR 98 Subpart C, Table C-1 (1,026 MMBtu/MMscf)

Gas Usage = Total gas combusted by unit (MMscf/yr)

2.2046 / 2000 = Conversion from kg to short tons

Fugitive GHG emissions for gas releases are calculated using the weight percent of CO₂ and CH₄ in the gas being released and the density of the gas. Specifically, emissions from gas releases are a simple mass balance, with the weight percent of CO₂ or CH₄ multiplied by the total amount of gas released into the atmosphere. Gas release amounts are tracked in Spectra's internal database. Weight percent of CO₂ and CH₄ and density are based on site-specific analyses.

$$\text{GHG} = \text{Gas Release} \times \text{Density} \times \text{wt\%} / 2000$$

With:

GHG = Emissions of GHG pollutant (CO₂, CH₄) (tpy)

Gas Release = Total gas released (MMscf/yr)

Density = density of gas (lb/MMscf)

wt% = Weight percent of GHG pollutant in gas stream (CO₂, CH₄)

2000 = Conversion from lb to short tons

GHG emissions from piping components are calculated according to the EPA's Protocol for Equipment Leak Emission Estimates.

$$\text{GHG} = \text{EF} \times \text{Component Count} \times \text{wt\%} \times 8760 \times 2.2046 / 2000$$

With:

GHG = Emissions of GHG pollutant (CO₂, CH₄) (tpy)

EF = Emission Factor for pollutant in kg/hr/component, from EPA's Protocol for Equipment Leak Emission Estimates

Component Count = the number of a specific type of component

wt% = Weight percent of GHG pollutant in gas stream (CO₂, CH₄)

8760 = Hours of emissions per year

2.2046 / 2000 = Conversion from kg to short tons

MDE Question 5

"Is Texas Eastern implementing a Leak Detection and Repair (LDAR) Program at its Accident facility?"

Response: Texas Eastern does not implement a LDAR program at the Accident Station since it is not an air permitting regulatory requirement for the station. As a best practice for safety considerations, Texas Eastern does undergo routine voluntary piping and component inspection activities to identify and address leaks in its pipeline components and implement repairs, if necessary, which is similar in practice to a regulatory detection program.

At the Accident Storage facility, each wellhead is inspected on a monthly basis for the purpose of monitoring the wellhead integrity in accordance with a standard operating procedure. The inspection includes visual monitoring for corrosion, fluid or gas leakage, and any evidence of damage to the wellhead assembly. Repairs are initiated and documented, if necessary. .

Texas Eastern Transmission is committed to resolving any outstanding questions related to these matters and is available to meet at your offices in order to facilitate the Title V renewal. If any additional follow up is required, I can be reached directly at (713) 627-4790.

Sincerely,



for

Reagan Mayces
Manager EHS US Operations - Air Compliance

cc: Mr. John Bins P.E., Spectra Energy Transmission, LLC
Ms. Divya Harrison, Trinity Consultants

ATTACHMENT

Attachment 1
Fugitive Categories Table

Table of Sources of Fugitive Emissions at the Texas Eastern Compressor Station and the Associated Storage Field Wellhead Locations

Place an 'x' in box to identify emissions for each source group. Add additional sources if applicable.

Source	Facility Gas Releases	Facility Pipeline Component Fugitives	Storage Field Gas Releases	Storage Field Pipeline Component Fugitives	Included in emissions certification: Y or N
Leaks from pipeline components at compressor station		X			Y
Leaks from storage field wellhead components				X	N
Leaks from MPVs**					
Releases from blowdowns and purges - MPV**					
Releases from blowdowns and purges - piping at compressor station***	X				Y
Releases from blowdowns and purges - wellheads and piping at storage fields***			X		N
Emergency releases - MPV	X				Y
Emergency releases - wellheads			X		N

* Spectra is requesting that the existing fugitive categories (F1, F2/MPV) be removed and four new fugitive categories are created that improve categorization of the source and type of fugitive emissions at the station and storage field.

** Leaks from MPV is not applicable and as such Spectra is removing this line from the table. Releases from blowdowns and purges MPV is a duplicate category as the releases from the compressor station are routed to the MPV.

***** Gas releases associated with rod packing leakage, unit valve leakage and blowdown valve leakage are not tracked or reported in the Emissions Certification Report. Gas releases tracked include scheduled (blowdowns, purges, etc.) and unscheduled releases (maintenance, emergency, etc.). Blowdowns include, but are not limited to, station blowdown, case venting, and ancillary equipment (emergency generator, fuel gas heater, blowdown of fuel lines and/or equipment, etc.). Purges include air purges and pipeline liquids purges, which use natural gas as the purging volume.**

Table 3. Potential Emissions

Emission Unit(s)	Emissions Unit Description	NO _x (TPY)	CO (TPY)	VOC (TPY)	SO ₂ (TPY)	PM /PM ₁₀ / PM _{2.5} (TPY)	HAPs (TPY)
E-92101	One (1) spark-ignited, lean burn IC engines, TCV-16, 5500 BHP, natural gas fired.	70.4	26.7	20.6	0.09	7.44	9.92
E-92102	One (1) spark-ignited, lean burn IC engines, TCV-16, 5500 BHP, natural gas fired.	70.4	26.7	20.6	0.09	7.44	9.92
E-92135	One (1) spark-ignited, rich burn 500 BHP IC emergency generator, natural gas fired.	2.64	4.32	0.03	<0.01	0.02	0.04
WBH01 WBH04	Two (2) 15 MMBtu/hr water bath heaters, natural gas fired.	12.9	10.8	0.71	0.08	0.98	0.24
WBH02 WBH03	Two (2) 12 MMBtu/hr water bath heaters, natural gas fired.	10.3	8.66	0.57	0.06	0.78	0.19
SBH05 SBH06	Two (2) 3 MMBtu/hr salt bath heaters, natural gas fired.	2.58	2.16	0.14	0.02	0.20	0.05
Tank-1 Tank-2	Two (2) pipeline liquids storage tank, 12,600 gallons.	---	---	4.83	---	---	0.07
PL-TL	Pipeline liquids truck loading	---	---	1.38	---	---	0.02
Station Fugitives	Facility Gas Releases Facility Pipeline Component Fugitives	---	---	86.1	---	---	5.98
Storage Field	Storage Field Gas Releases Storage Field Pipeline Component Fugitives	---	---	139.9	---	---	4.68
Total		169.2	79.4	274.8	0.34	16.9	31.1

