E-MAIL ATTACHMENT
DEP Comments on Air Quality Analyses for Prevention of Significant Deterioration
Energy Transfer Marketing & Terminals, L.P.
Plan Approval Application 23-0119K
Proposed Ethane Chilling Expansion Project
Marcus Hook Terminal, Marcus Hook Borough, Delaware County

Appendix F

1. The title of Appendix F should be "NO_2, CO, & PM-2.5 Air Dispersion Modeling Report." All references to Appendix F in the application should be revised accordingly.

2.2.1 Project Sources

2. The source base elevations in the AERMOD input files differ slightly from those entered in the BPIPPRM input file, those generated by the AERMOD terrain preprocessor (AERMAP) in the "ETP.SOU" file, and those listed in the Attachment C (Model Source Information). These differences are listed in the table below.

Comparison of Source Base Elevations

Source	AERMOD Input (m)	BPIPPRM Input (m)	ETP.SOU File (m)	Attachment C (m)
B031	6.93	6.93	7.16	6.82
WWF	2.44	2.97	3.44	3.27
ME1CF_LP	3.35	3.47	3.40	3.40
ME1CF_HP	3.35	3.47	3.40	3.40
ME2CF_LP	3.05	5.44	6.36	2.59
ME2XCFLP	6.10	5.40	5.33	5.49
ME2XCFHP	6.10	5.40	5.33	5.49
152BCTC1	3.50	3.50	3.57	3.54
152BCTC2	3.53	3.53	3.57	3.54
152BCTC3	3.51	3.51	3.56	3.50
152BCTC4	3.53	3.53	3.54	3.48
152BCTC5	3.51	3.51	3.62	3.48
152BCTC6	3.48	3.48	3.57	3.47
230119C1	3.01	3.01	3.35	2.87
230119C2	3.19	3.19	3.34	2.94
230119C3	3.32	3.32	3.31	2.95
230119D1	2.94	2.94	3.02	2.98
230119D2	2.88	2.88	2.92	2.87
230119D3	2.91	2.91	2.85	2.87
1WSAC1	3.82	3.82	3.65	3.63
1WSAC2	3.71	3.71	3.64	3.76
1WSAC3	4.11	4.11	3.75	3.78
1WSAC4	4.83	4.83	3.94	4.00
1WSAC5	5.48	5.48	4.24	4.44
2WSAC1	3.41	3.41	3.47	3.38
2WSAC2	3.36	3.36	3.36	3.33
2WSAC3	3.47	3.47	3.36	3.37
2WSAC4	3.79	3.79	3.38	3.53
2WSAC5	4.15	4.15	3.44	3.41

3. The source of the stack heights in the table in Attachment C should be documented for all sources.

4. The table in Attachment C should include a column or footnote with the actual flare stack heights (H_s) used in the effective stack height calculations the same way footnote "c" provides the total heat release rates. Also, the following flare stack heights are entered in the BPIPPRM input file: WWF – 60.81 meters (199.5 feet), ME1CF_LP and ME1CF_HP – 36.58 meters (120 feet), ME2CF_LP – 76.20 meters (250 feet), and ME2XCFLP and ME2XCFHP – 59.44 meters (195 feet). Using the formulas below from the AERSCREEN User's Guide and referenced in footnote "b", different effective stack heights from what is listed in the table would be calculated from the stack heights entered in the BPIPPRM input file.

$$D = 9.88 \times 10^{-4} \times \sqrt{HR \times (1 - HL)} \quad (1)$$

$$h_{eff} = H_s + 4.56 \times 10^{-3} \times HR^{0.478} \quad (2)$$

Where D is effective stack diameter, HR is the heat release rate, HL is the heat loss fraction, H_{eff} is effective stack height and H_s is the stack height entered by the user.

5. The source of the stack diameters in the table in Attachment C should be documented for all sources. Footnote "a" is not marked in the table for the B031/B033/B034 source. Also, the source of the total heat release rates in footnote "c", used in the effective stack diameter calculations for the flares, should be documented.

6. The source of the stack exit temperatures in the table in Attachment C should be documented for all sources. In particular, how was a single value of 425.37 K for all scenarios for the B031/B033/B034 source determined and how was a value of "0" for the cooling units determined so that AERMOD adjusts the exit temperature to match the ambient temperature?

7. The source of the stack exit velocities in the table in Attachment C should be documented for all sources. In particular, how were the stack exit velocities for the different scenarios for the B031/B033/B034 source determined and how were the stack exit velocities for the cooling units determined?

8. The source of the emission rates in the table in Attachment C should be documented for all sources. The emission rates entered in AERMOD do not appear to relate to the emissions calculations in Appendix D (Detailed Emissions Calculations). Calculations used to determine the emission rates entered in AERMOD should be provided. Additionally, please clarify why the short-term and annual emission rates for the B031/B033/B034 source are identical for NO_X and CO, but differ for PM-2.5. Also, the "CO Annual Emission Rate" column seems unnecessary since there is not an annual National Ambient Air Quality Standard (NAAQS) for CO.

2.3 Building Wake Effects

9. This subsection should include a reference to Attachment B (Facility Layout) which contains the "Source Point and Downwash Area Modeling" imagery.

10. The BPIPPRM input file should be updated to reflect any changes to the facility layout associated with the sources authorized in Plan Approval 23-0119J. For example, the location of downwash structure "BLD_4" (Bldg 854) overlaps with the locations of the 2WSAC1 and 2WSAC2 (Wet Surface Air Cooler) sources. Additionally, two new tanks to be installed under Plan Approval 23-0119J are not included in the BPIPPRM input file and are not depicted in Attachment B. Also, a building to the west of the 1WSAC and 2WSAC sources and southwest of the ME2XCFLP (ME-2x ColdFlare LP) and ME2XCFHP (ME-2x ColdFlare HP) sources was not included in the BPIPPRM input file.

11. Downwash structures "TANK_5" (522) and "TANK_6" (390) are both included in the BPIPPRM input file and appear in Attachment B. However, the March 2020 renewal of the Title V Operating Permit 23-00119 notes the removal of both structures. Therefore, the BPIPPRM input file and Attachment B should be updated.

12. In the BPIPPRM input file, the stack heights entered for the 152BCTC1 through 152BCTC6 (15-2B Cooling Tower Cell 1 through 6) sources are 6.10 meters and the height entered for the associated structure "44" (15-2B CT) is 13.80 meters. Aerial imagery indicates that the stack heights should be greater than the height of the associated structure. Also, the coordinates of these sources do not appear to align with the coordinates of the associated structure.

13. In the BPIPPRM input file, the stack height, 36.58 meters (120 feet), entered for the ME1CF_LP (ME-1 ColdFlareLP) and ME1CF_HP (ME-1 ColdFlare HP) sources does not match the stack height, 30 feet (9.144 meters), listed for these sources (Flares – C01 Cold Flare (Source ID: C01)) on the forms in Appendix A (PADEP Plan Approval Forms).

14. Appendix B (Plot Plan) highlights the locations of the new refrigeration train (Train D) and Boil Off Gas (BOG) system. Do either of these locations contain structures that should be included in the BPIPPRM input file as well as Attachment B?

3.1 Model Selection and Application

15. If warranted, ETMT should consider using AERMOD v22112, released by the U.S. Environmental Protection Agency (EPA) on June 27, 2022, in responding to these comments.

3.1.1.1 Significant Impact Analysis Modeling Procedures

16. Figure II-2 of the EPA's "Guidance for Ozone and Fine Particulate Matter Permit Modeling" (EPA-454/R-22-005, July 2022) is a flowchart that provides an overview of the PM-2.5 Prevention of Significant Deterioration (PSD) increments compliance demonstration. The decision diamond "Major Source Construction Since Major Source Baseline Date?" (Yes or No) has not been determined by the DEP. Therefore, in addition to assuming "No" and proceeding to the decision diamond "Source Impact Above Increment?" (as was done in this analysis), ETMT should also assume "Yes" and proceed to the decision diamond "Source Impact Greater Than or Equal to SIL?". That being said, the methodology stated in this subsection, "the high-1st-high value averaged at each receptor over 5 years is compared to the applicable SILs" is appropriate in the 24-hour PM-2.5 and annual PM-2.5 significant impact level (SIL) analyses relative to the PM-2.5 NAAQS. However, concentrations should not be averaged over the 5 years in the 24-hour PM-2.5 and annual PM-2.5 SIL analyses relative to the PM-2.5 PSD increments.

In the 24-hour PM-2.5 SIL analysis for the Class II PSD increment, the model input files for the 24-hour PM-2.5 SIL analysis for the NAAQS could be used, but the H1H keyword should be utilized in AERMOD's control (CO) pathway to "turn off" the averaging of concentrations before executing AERMOD for each scenario. As an alternative to executing AERMOD for the 24-hour PM-2.5 SIL analysis for the Class II PSD increment, the AERMOD plot (.PLT) files for the 24-hour PM-2.5 SIL analysis for the NAAQS could be examined to determine the maximum 24-hour average concentration within the 5 years for each scenario. In the annual PM-2.5 SIL analysis for the Class II PSD increment, the model input files for the annual PM-2.5 SIL analysis for the NAAQS could be used, but AERMOD should be executed separately for each year to determine the maximum annual average concentration within the 5 years for each scenario. Also, this comment relates to comments 27 and 28 regarding model results.

17. In Table 3-1, the following revisions should be made:
- Reference to footnote "g" should also follow the primary annual PM-2.5 NAAQS;
- Reference to an additional footnote for 40 CFR 51.165(b)(2) should follow the 1-hour CO, 8-hour CO, and annual NO_2 Class II SILs;
- Reference to an additional footnote for EPA's April 17, 2018, memorandum, "Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program" should follow the 24-hour and annual PM-2.5 Class II SILs; and
- Reference to an additional footnote for 40 CFR § 52.21(i)(5)(i) should follow the annual NO_2 and 8-hour CO SMCs.

3.3.3 Effects on Growth, Soils, Vegetation, and Visibility

18. In Table 3-7, how were the project emissions calculated for each compound and which sources at the facility emit these compounds? Also, boron and fluoride are both listed in Table 5-7 of EPA's "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals" (EPA 450/2-81-078, December 12, 1980). Why were project emissions for these compounds omitted?

3.4 Receptor Grids

19. The "ETP_25km_10m.ROU" file, called by the receptor (RE) pathway of the AERMOD input files in the "Class II SIL", "PM2.5 Class II Increment", and "Soils and Vegetation" analyses, and the AERMAP files associated with the processing of this file were not included in the "electronic modeling archive." The AERMAP folder in the "electronic modeling archive" includes files associated with the processing of 4,101 model receptors, but the AERMOD output files indicate that 8,653 model receptors were used.

20. The segments of Blueball Avenue and the Northeast Corridor train line that run through the facility's property should be considered "ambient air" and include model receptors. See the EPA's December 2, 2019, memorandum, "Revised Policy on Exclusions from "Ambient Air"."

3.5 Meteorological Data for Air Quality Modeling

21. The DEP has reprocessed the Philadelphia International Airport (KPHL) 2016-2020 meteorological dataset using AERMET v22112, released by the EPA on June 27, 2022. If warranted, ETMT should consider using this updated KPHL meteorological dataset in responding to these comments. The DEP will provide the updated KPHL meteorological dataset upon request. The DEP notes the following revisions in the updated KPHL meteorological dataset:

- In the Washington Dulles International Airport (KIAD) upper air data file in the Forecast Systems Laboratory (FSL) format, a "Line 9" with missing data codes (i.e., " 9 99999 85 99999 99999 99999 99999") was added where the first level of the 12Z measurements was not a type 9 as listed in the AERMET Stage 1 messages file (W31 warning). These additional lines were added to the 12Z measurements for the following dates: 6 APR 2017, 8 JUL 2017, 13 JUL 2017, and 19 AUG 2017. This enables AERMET to read the 12Z measurements and calculate convective boundary layer parameters for these dates, therefore improving the meteorological data completeness. The DEP revised its meteorological dataset completeness documentation which ETMT may want to include as Attachment F (Meteorological Data Completeness – KPHL – 2016-2020);

- In AERSURFACE, more recent (since the DEP's last processing of the KPHL meteorological dataset on June 2, 2021) land cover and impervious surface data for 2016 from the U.S. Geological Survey's (USGS) National Land Cover Dataset (NLCD) was utilized; and
- In AERSURFACE, the user-defined sector definitions for the surface roughness length study area were revised based on the more recent land cover and impervious surface data for 2016. Sector 5 was revised from 200-260 degrees to 200-230 degrees and sector 6 was revised from 260-330 degrees to 230-330 degrees.

3.5.3 Meteorological Data Representativeness

22. This subsection should reference Attachment G (Location of KPHL ASOS Station and Project Site) instead of Attachment H.

3.5.3.1 Representativeness of Surface Characteristics

23. This subsection should reference Attachment H (Micrometeorological Variables Comparison KPHL Airport and Project Site) instead of Attachment I (which does not exist).

24. Please include the KPHL meteorological data processed with the site-derived surface characteristics in the "electronic modeling archive" as indicated by the last sentence in this subsection. The data should include the "AERMOD-ready" surface (.sfc) and profile (.pfl) files as well as all AERMET and AERSURFACE files associated with the processing of these files.

3.6 Class I Impacts

25. This subsection should include the calculation of Q. Subsection 3.2 of the "Federal Land Managers' Air Quality Related Values Work Group (FLAG): Phase I Report – Revised (2010)" defines Q as the "total SO_2, NO_X, PM_{10}, and H_2SO_4 annual emissions (in tons per year, based on 24-hour maximum allowable emissions." A footnote should be added to Table 3-8 (Distances to Class I Areas and Q/D Values) with the value of Q.

26. This subsection states, "SPMT will notify Federal Land Managers (FLM's) of the proposed project and will provide them with the Q/D analysis." Please provide copies of these communications with the FLMs of the U.S. Fish and Wildlife Service, National Park Service, and U.S. Forest Service. These communications and FLM responses should be included as an additional attachment.

4.1 Class II SIL Analysis Results

27. This subsection should also include a table that presents the results of the 24-hour PM-2.5 and annual PM-2.5 SIL analyses for the Class II PSD increments for all the scenarios evaluated. See comment 16.

4.2 Class II PM2.5 Increment Analysis Results

28. Table 4-4 should be revised to include the maximum 2nd-high 24-hour PM-2.5 concentration and maximum annual PM-2.5 concentration based on the scenario(s) which yields the maximum 24-hour PM-2.5 concentration and maximum annual PM-2.5 concentration in the 24-hour PM-2.5 and annual PM-2.5 SIL analyses for the Class II PSD increments, respectively. See comment 16.