

Additional DEP Technical Review Comments on Inhalation Risk Assessment
Shell Chemical Appalachia LLC
Application for Plan Approval 04-00740D
WWTP Permanent Controls Project, EMACT Project, and Plan Approval Reconciliations
Shell Polymers Monaca Site, Center and Potter Townships, Beaver County
July 14, 2025

Appendix D-3A

Emission Estimates for the Inhalation Risk Assessment for Shell Polymers Monaca, Beaver County, Pennsylvania

Notes:

Appendix B refers to the Appendix B replacement document (Potential to Emit Calculations) that was submitted to DEP's Southwest Regional Office by Landau Associates on June 3, 2025. Page numbers listed in the comments refer to the replacement Appendix B pdf document.

C-spreadsheet, A-spreadsheet, and Appendix D-3A refer to the replacement documents located in the Monaca Electronic Modeling Files 05-29-2025 that was submitted to DEP by Landau Associates on May 29, 2025.

Tables 1, 2a, 2b, 3a and 3b refer to the Annual Average and Maximum Hourly COPC Emission Rate Tables in the replaced Appendix D-3A.

Air Emission Sources (These comments were made previously, No. 2, 16, 17, 18)

1. There are 88 air emission sources on the C-Spreadsheet and A-Spreadsheet. Table 2a and Table 3a have 59 sources (not including total ECFUG and total OSBLFUG) with an additional 26 fugitive sources on Table 2b, and Table 3b. This is a total of 85 sources in Appendix D-3A. Appendix B Source ID 501 pages 112-123 do not list the 26 fugitive sources or any calculations for the lb/hr emission rates. It is unclear how the fugitive emissions on Pages 112-123 equate to the 26 fugitive sources on the C-spreadsheet, A-spreadsheet, Table 2b, and Table 3b. Please submit revised Pages 112-123 with the 26 fugitive sources and the lb/hr emission calculations. Also, reconcile the difference in the number of sources from the 85 in Appendix D-3A to the 88 that are listed on the C-Spreadsheet and A-Spreadsheet.

Turbine Duct Burners Source ID 101-103 (This comment was made previously, No. 6 & No. 7)

2. Emission rate calculations for lead are listed in Appendix B Page 10; however, the lead emission was not entered into the C-Spreadsheet, A-Spreadsheet, Table 2a, and Table 3a. Also, the emissions data on Page 11, Appendix B should be presented in a consistent manner. Please present all data in scientific notation.

Spent Caustic Thermal Oxidizer Source ID C206 (This comment was made previously, No. 13)

3. AP-42, Chapter 1.4 (Natural Gas Combustion) was used to identify the COPC and emission factors. Lead is listed in AP-42 Table 1.4-2; however, lead was not listed in Appendix B page 103-104, and not entered into the C-Spreadsheet, A-Spreadsheet, Table 2a, and Table 3a.

Liquid Loadout Recovered Oil Source ID 302 (This comment was made previously, No. 14)

4. Source ID 302 emissions are on the C-spreadsheet and A-spreadsheet and not in Table 2a and Table 3a. What source are the emissions applied to in Table 2a and Table 3a? Also, Appendix B page 108 lists Source ID 302 with a total annual HAP emission rate of 0.10 T/yr; however, there are no emission calculations or segregation of the total HAP and it is unclear how the T/yr emission rate on page 108 relates to the lb/hr emission rates in the spreadsheets. Please submit a revised page 108 with the lb/hr emission calculations for this source listing the individual HAPs and include the lb/hr emissions in Table 2a and Table 3a.

C3+ Railcar Loading Source ID 304 (This comment was made previously, No. 15)

5. Source 304 emissions are on the C-spreadsheet and A-spreadsheet and not in Table 2a and Table 3a. Please clarify what source the three HAP emissions on page 110 of Appendix B apply to and include them Tables 2a and 3a.

PE 3 Fugitives (No Source ID)

6. The PE 3 fugitives hexane emission of 1.31E-02 lb/hr is listed in the C-spreadsheet, A-spreadsheet, and Table 2a and Table 3a. It is unclear as to what source in Appendix B the hexane emission applies to and how the emission rate was calculated. Provide the Appendix B page where the PE 3 Fugitives is located, include the hexane calculations, and Source ID.

Table 1

7. 82 COPC are listed on Table 1, there should be 84, missing benzo(g,h,l)perylene and butyr/isobutyraldehyde.

Table 2a

8. 83 COPC are listed on Table 2a, there should be 84, missing benzo(g,h,l)perylene.

9. Cracking Furnaces Source ID 031-037

- Mercury and 3-methylchloranthrene have a different lb/hr values than the C-Spreadsheet.
- Methylcyclohexane has a lb/hr value, this COPC is not emitted from this source.
- Ethane and 2-methylnaphthalene lb/hr values are missing.

10. Turbine Duct Burners Source ID 101-103

- Ammonia lb/hr value is missing.

11. Emergency Generator Engines Source ID 105 & 107
 - Benzo(g,h,i)perylene and methylcyclohexane lb/hr values are missing.
 - The following COPC lb/hr values are incorrect, acenaphthene, acenaphthylene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, and phenanthrene.
 - 3-methylchloranthrene has a lb/hr value, this COPC is not emitted from this source.
12. Continuous Vent Thermal Oxidizer Source ID C204A
 - Mercury and 3-methylchloranthrene have different lb/hr values than the C-Spreadsheet.
 - Methylcyclohexane has a lb/hr value, this COPC is not emitted from this source.
 - Ethane and 2-methylnaphthalene lb/hr values are missing.
13. Multi-Port Ground Flare Source ID 204B
 - Mercury and 3-methylchloranthrene have different lb/hr values than the C-Spreadsheet.
 - Methylcyclohexane has a lb/hr value, this COPC is not emitted from this source.
 - Ethane and 2-methylnaphthalene lb/hr values are missing.
14. Totally Enclosed Ground Flare Source IDs C205A, C205B, and C205C
 - Mercury and 3-methylchloranthrene have different lb/hr values than the C-Spreadsheet.
 - Methylcyclohexane has a lb/hr value, this COPC is not emitted from this source.
 - Ethane, 2-methylnaphthalene, and Pentane lb/hr values are missing.
15. Process Cooling Towers Source ID 203
 - Toluene lb/hr value is missing.

Table 3a

16. 83 COPC are listed on Table 3a, there should be 84, missing benzo(g,h,i)perylene.
17. Cracking furnaces Source ID 031-037
 - Mercury and 3-methylchloranthrene have different lb/hr values than the A-spreadsheet.
 - Methylcyclohexane has a lb/hr value, this COPC is not emitted from this source.
 - 2-methylnaphthalene lb/r value is missing.
18. Emergency Generator Engines ID 105 & 107
 - Benzo(g,h,i)perylene and methylcyclohexane lb/hr values are missing.
 - The ethylene dibromide lb/hr value is listed as 4.09E-03, it should be 4.66E-05.
 - 3-methylchloranthrene has a lb/hr value, this COPC is not emitted from this source.

19. Continuous Vent Thermal Oxidizer Source ID C204A
 - Mercury and 3-methylchloranthrene have different lb/hr values than the A-Spreadsheet.
 - Methylcyclohexane has a lb/hr value, this COPC is not emitted from this source.
 - 2-methylnaphthalene lb/hr value is missing.
20. Multi-Point Ground Flare Source ID 204B
 - Mercury and 3-methylchloranthrene have different lb/hr values than the A-Spreadsheet.
 - Methylcyclohexane has a lb/hr value, this COPC is not emitted from this source.
 - 2-methylnaphthalene lb/hr value is missing.
21. Totally Enclosed Ground Flare Source IDs C205A, C205B, and C205C
 - Mercury and 3-methylchloranthrene have different lb/hr values than the A-Spreadsheet.
 - Methylcyclohexane has a lb/hr value, this COPC is not emitted from this source.
 - 2-methylnaphthalene lb/hr value is missing.
22. PE Units 1,2 & 3 Source ID 202
 - Chromium VI lb/hr values are missing.

A-Spreadsheet

23. 83 COPC are listed on the A-Spreadsheet, there should be 84, missing benzo(g,h,l)perylene.
24. Emergency Generator Engines ID 105 & 107
 - Diesel Emergency Generators No. 1 & No. 2 have a lb/hr value for benzo(g,h,i)perylene, there is no lb/hr value for benzo(g,h,i)perylene it should be for benzo(g,h,l)perylene instead.
 - Natural Gas emergency generator No. 3 & No.4 ethylene dibromide lb/hr values are incorrect. No. 3 has 2.64E-03 it should be 3.02E-05. No.4 has 1.45E-03 it should be 1.64E-05.

C-Spreadsheet

25. 82 COPC are listed on the C-Spreadsheet, there should be 84, missing benzo(g,h,l)perylene and zinc.
26. Ethane Cracking Furnace Source ID 031-037
 - Zinc lb/hr value is missing.

27. Emergency Generator Engines Source ID 105 & 107
- Diesel emergency generators No. 1 & No. 2 have a lb/hr value for benzo(g,h,i)perylene, there is no lb/hr value for benzo(g,h,i)perylene it should be for benzo(g,h,l)perylene instead.
 - Emergency Generator No. 4 is missing the following COPC emissions: acenaphthene, acenaphthylene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, and phenanthrene.
28. Continuous Vent Thermal Oxidizer Source ID C204A
- Zinc lb/hr value missing.
29. Multi-Point Ground Flare Source ID 204B
- Zinc lb/hr value is missing.
30. Spent Caustic Thermal Oxidizer Source ID C206
- Zinc lb/hr value is missing.

Appendix D-3C

Inhalation Risk Assessment for Shell Polymers Monaca, Beaver County, Pennsylvania

Notes:

Appendix D-3C refers to the replacement Appendix D-3C located in the Monaca Electronic Modeling Files05-29-2025 that was submitted to DEP on May 29, 2025.

Tables 1, 2, and 3 are from the replaced Appendix D3-C.

Table 1

31. 81 COPC are listed on Table 1, there should be 84, missing benzo(g,h,l)perylene, chloroethane, and 1,3,5-trimethylbenzene.
32. The Chronic RfC for Barium is in the Acute RfC column and the Acute RfC is in the IUR column.
33. Please use the ACGIH value of 20 ppm, rather than the ATSDR value, to calculate the ethyl benzene Acute RfC. $ACGIH\ TWA = 20\ ppm = 86.84\ mg/m^3 = (3 * TWA / 20) = 1.30+01\ mg/m^3$.

Table 2

34. 83 COPC are listed on Table 2, there should be 84, missing benzo(g,h,l)perylene.

Table 3

35. 83 COPC are listed on Table 3, there should be 84, missing benzo(g,h,l)perylene.