Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

November 13, 2022

Mark Gorog P.E., Regional Manager Air Quality
Program Pennsylvania Department of Environmental
Protection Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

RE: PA-04-00740C Ethane Cracker Unit (Source ID 201), Ethylene Vaporizer System Channel Head Leak and Excess Emission Report

Dear Mr. Gorog,

Shell Chemical Appalachia LLC ("Shell") is submitting this Malfunction Report to the Pennsylvania Department of Environmental Protection (PADEP) for excess emissions from a liquid leak at the channel head area of the ethylene vaporizer system during a restart of this system.

- **Name and location of the facility**
  Shell Polymers Monaca
  300 Frankfort Road, Monaca PA, 15061

- **Nature and cause of the incident**

  During the restart of the ethylene vaporizer system in the ECU, operations detected a liquid ethylene leak in the channel head area of this heat exchanger (E-64210). The ethylene vaporizer was isolated and the system was depressurized to stop the leak and to safely facilitate the repair. Ethylene in the unit was sent to the ethylene storage tank during the depressurization step.

  Once the reactor was depressurized and the insulation removed to facilitate the repair, the channel head leak was repaired by re-tensioning the flange bolts, and the system readied to put into service.

- **Time when the incident was first observed, and duration of excess emissions**
  Excess emission occurred from ethylene leak at the channel head area of the unit. It was initially discovered on November 14, 2022 at approximately 14:12 and ended at approximately 17:34 the same day.

  Emissions were reduced by quickly finding the leak, depressurizing the unit to the ethylene storage tank and repairing the leak quickly to safely make the repair. Flaring was avoided by utilization of the storage tank.

- **Estimated rate of excess emissions**
  Based on the heat exchanger pressures at the beginning of the leak and the time required to depressurize the unit, estimated excess emissions resulting from the leak of liquid ethylene have been calculated using the composition and engineering principles as:

  VOC: 0.148 tons (ethylene)

If you have any questions regarding this matter, please contact me at (724) 709-2467 or kimberly.kaal@shell.com.

Sincerely,

Kimberly Kaal
Environmental Manager, Attorney-in-Fact

CC:
Anna Hensel, District Supervisor
Scott Beaudway, Air Quality Specialist