



Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

November 25, 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-04-00740A/C Ethylene Manufacturing Line (Source ID 201) and High-Pressure Header System (Source ID C205) Excess Emission Report - Initial Ethane Dryer Swap Event (10/24/2022)

Dear Mr. Gorog,

Shell Chemical Appalachia LLC (“Shell”) is submitting this Malfunction Report to the Pennsylvania Department of Environmental Protection (PADEP) for an unexpected process upset of during the initial swap of two ethane dryers in the Ethylene Manufacturing Line (ECU).

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

- **Nature and cause of the incident**

During start-up activities of Ethylene Manufacturing Line (Source 201), Shell operations received a high moisture alarm in the ECU. Because of this, Operations switched from one ethane dryer to a second ethane dryer in order to clear the alarm. This was the first time that the second dryer was put into service. Initial indications were that the dryer move corrected the alarm, but then other alarms were received indicating an apparent slug of CO progressing through the unit which would negatively impact the catalyst in the AC reactor. As a result, operations removed feed from the C2 splitter and flared the ECU process gas to the HP flare system.

- **Time when the incident was first observed, and duration of excess emissions**
Excess emissions began with the ECU directing process gas to the HP Flare System on October 24, 2022, beginning at approximately 14:30 and ending when the ECU was making on spec ethylene and removal of tail gas from the flares on October 26, 2022 at approximately 16:30.

Excess emissions to the HP Flare System were reduced by quickly responding to the upset condition and minimizing flaring by re-establishing on spec ethylene production and tail gas usage as fuel for the furnaces. An after-action review was held on October 26, 2022 to review the incident and to determine follow-up corrective actions.

- **Estimated rate of excess emissions**

The initial event resulted in use of the HP elevated flare for approximately 24 minutes and with visible emissions from the high-pressure elevated flare occurring for approximately 11 minutes as determined from reviewing the flare video footage. Method 22 observations were conducted shortly after the initial elevated flare usage ended and no further visible emissions were noted from the HP Flare System.

The following emissions are the preliminary estimated excess emissions flared at the HP Flares during this event. Emission estimates are based on the HP header vent gas flow meter readings and gas chromatograph composition data at the time:

CO₂e: 4,320.16 tons
CO: 15.16 tons
NO_x: 3.32 tons
SO₂: 0.0 tons
PM_{filt}: 0.09 tons
PM₁₀: 0.36 tons
PM_{2.5}: 0.36 tons
VOC: 10.07 tons
HAP: 0.09 tons

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

Sincerely,

Kimberly Kaal

Kimberly Kaal
Environmental Manager, Attorney-in-Fact

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