



Shell Chemical Appalachia LLC
 300 Frankfort Rd
 Monaca, PA 15061

October 27, 2023

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

RE: PA-04-00740C LP Multipoint Ground Flare (C204B) Ethylene Header Visible Emissions Follow Up Report

Dear Mr. Gorog,

Shell Chemical Appalachia LLC (“Shell”) is submitting this malfunction report follow up to the Pennsylvania Department of Environmental Protection (PADEP) for multiple cases of non-compliant visible emissions from the ethylene header of LP Multipoint Ground Flare. The intent of this report is to provide a status update of the site efforts to avoid future smoking events.

- **Name and location of the facility**

Shell Polymers Monaca
 300 Frankfort Road, Monaca PA, 15061

- **Nature and cause of the incidents**

Multiple malfunction reports have been submitted to the department related to visible emissions (VE) from ethylene header of the LP Multipoint Ground Flare (MPGF) exceeding 5 minutes in a 2-hour period. The root cause of the VE is the same for all of these events and has been identified as: the inability of the ethylene header MPGF air-assist fan to ramp up fast enough in cascade mode to provide enough air for proper combustion to prevent smoking.

- **Summary of past malfunctions**

Date	VE Duration	Report Subject
7/10/2023	5 minutes, 57 seconds	RE: PA-04-00740C LP Multipoint Ground Flare Visible and Excess Emissions Malfunction Report
8/3/2023	6 minutes, 3 seconds	RE: PA-04-00740C Polyethylene Manufacturing Lines (Source ID 202), Low Pressure (LP) Header System (Source ID 204) Visible and Excess Emissions Malfunction Report
9/2/2023	14 minutes, 12 seconds	RE: PA-04-00740C Polyethylene Manufacturing Lines (Source ID 202), Low Pressure (LP) Header System (Source ID 204) Visible and Excess Emissions Malfunction Report
10/11/2023	8 minutes, 13 seconds	to be submitted

- **Mitigations to avoid future VE events**

As documented in the past malfunction reports, the mitigation of the console operator taking manual control of the fan speed in response to events which result in VE from MPGF remains in place. In addition, improvements to alarms have been made to allow for quicker notification to

the console operator of flow in the ethylene header.

Longer term solutions are in development and include:

1. The site has engaged with the flare vendor. The flare vendor reviewed the system and its issues in detail and recommended a step test to allow for a more robust “fan curve”, which is what the existing fan control scheme is based on. The curve represents the appropriate fan speed for a range of waste gas flows but can benefit from being adjusted to real plant data.

The step test will include manually increasing flow from the ethylene tank to the MPGF, monitoring for VE, and then ramping up fan speed in a controlled manner and documenting the point at which the VE dissipates. The plan is to implement the step test before the end of the year (pending plant status), with appropriate vendor support.

2. Currently in consideration: flare vendor contour technology, which includes continuous monitoring of the flare’s combustion zone and automatically adjusts the air in response to deviations from optimal combustion. This may not be required pending the success of item #1 above but is being reviewed in parallel.

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:
Scott Beaudway, Air Quality Specialist
Kristin Goddard, Environmental Compliance Specialist
Beth Speicher, Environmental Group Manager