



Shell Chemical Appalachia LLC  
300 Frankfort Rd  
Monaca, PA 15061

August 7, 2024

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 Source ID 205A and B HP Ground Flare #1 and #2 Visible Emissions Malfunction Report**

Dear Mr. Gorog,

Shell Chemical Appalachia LLC (“Shell”), located in Beaver County PA is submitting this Malfunction Report to the Pennsylvania Department of Environmental Protection (PADEP) for visible emissions from HP Ground Flares #1 and #2.

This malfunction did not pose an imminent and substantial danger to the public health and safety or the environment.

- **Name and location of the facility**  
Shell Polymers Monaca  
300 Frankfort Road, Monaca PA, 15061
- **Nature and cause of the incident**  
On July 10 2024, starting at approximately 16:27, visible emissions (VE) were present at the HP Ground Flares #1 and #2 [Totally Enclosed Ground Flares (TEGF) A/B]<sup>1</sup>. Smoking was mostly continuous, gray in color, and exceeded 5 minutes in less than a 2-hour period for each ground flare. The cause of the incident was determined to be low flare rates paired with high C3/C4 hydrocarbon concentrations for the TEGF staging configuration at the time, yielding flare combustion temperatures which were not high enough to result in smokeless combustion. The elevated C3/C4 content was due to an Ethane Cracking Unit (ECU) equipment upset which required temporary flaring of the C3+ product stream. The ECU flaring does not meet the definition of a flaring event as defined in the site’s Flare Minimization and Management Plan (FMMP).
- **Time when the malfunction or breakdown was first observed**  
VE started on July 11, 2024, at 16:27
- **The date and time that the malfunction started and ended**  
VE started on July 11, 2024, at 16:27 and VE ended on July 11, 2024, at 16:36.
- **An estimate of the emissions associated with the malfunction**  
No excess emissions. The malfunction is visible emissions only as the ECU flaring does not

<sup>1</sup> TEGF A/B is the site name for Source ID C205A/B HP Ground Flare #1/#2 in PA-04-00740C

meet the definition of a flaring event per the site's FMMP.

Summary of VE elapsed time from TEGF A/B as determined by review of flare camera footage is captured below.

- TEGF A: 8 minutes and 55 seconds of VE observed between 16:27:17 and 16:36:12
- TEGF B: 6 minutes and 41 seconds of VE observed between 16:27:48 and 16:35:05

A Method 22 observation was performed by operations, and the form is attached to this report. Note that the VE had ceased by the time the observation commenced, which is noted on the form.

- **The calculations that were used to determine that quantity**

N/A

- **The steps, if any, that the facility took to limit the duration and/or quantity of emissions associated with the malfunction**

Once the visible emissions were noted, the operations team commenced console troubleshooting. In addition, real-time technical support was provided. Flare stages were manually adjusted until the VE ceased.

- **A detailed analysis that sets forth the Root Cause of the malfunction, to the extent determinable**

Low flare vent gas flow rates coupled with high C3/C4 hydrocarbon concentrations and the TEGF A/B staging configuration at the time of the malfunction resulted in flare combustion temperatures which were not high enough to yield smokeless combustion. In June 2024, extensive TEGF repairs were implemented to improve TEGF performance. This is detailed in the "SPM TEGF Repairs Report" submitted in accordance with the May 24, 2023, Consent Order and Agreement.

All mechanical repairs were complete as of June 28, 2024, for both TEGF A and B. Since the repairs changed the capacity of some of the existing stages, destaging pressure adjustments were likely required, but the specific destaging pressure setpoints were expected to need tuning based on equipment performance and real time flare operation. This tuning had not yet been completed at the time of the VE malfunction on July 10, 2024 and the specific flare flow and composition experienced that day. Therefore, the staging configuration following the initial spike of flow from the ECU upset did not automatically go back to configuration that resulted in smokeless combustion.

- **An analysis of the measures, if any, that are available to reduce the likelihood of a recurrence of a malfunction resulting from the same Root Cause or contributing causes in the future**

Necessary destaging pressure adjustments were made based on the learnings from this specific event. Specifically, the stage 4 destaging pressure was adjusted for each TEGF.

Note that there is a potential that future destaging pressure adjustments/optimizations will be required for certain flaring scenarios. This is being managed through the site's existing VE monitoring process, operator awareness and training, and technical review of future flaring event process data.

- **To the extent that investigations of the causes and/or possible corrective action(s) still are**

**underway on the due date of the report, a statement of the anticipated date by which a follow-up report will be submitted**

No follow up report is anticipated.

- **Corrective action is final or timeline for implementation**  
Corrective actions are complete.

If you have any questions regarding this matter, please contact Kim Kaal at [kimberly.kaal@shell.com](mailto:kimberly.kaal@shell.com) or me at [william.watson@shell.com](mailto:william.watson@shell.com).

Sincerely,

A handwritten signature in black ink, appearing to read 'William Watson', written in a cursive style.

William Watson  
Operations Manager

CC:

Scott Beaudway, Air Quality Specialist  
Beth Speicher, Environmental Group Manager

**Attachment A- Method 22 Form**

**Shell Polymers Monaca**  
**Method 22 Visible Emissions Observation Form SPM-HSE-FO-0003**

Observer Name: [REDACTED]

Observer Title: Field Operator

Date and Time (MM/DD/YY XX:XX): 7/10/24 16:45

Sky Conditions: Partly Cloudy

Precipitation: None

Wind Direction (direction from): S      202.3

Wind Speed (m/s): 1.2m/s

[Site MET Data \(Wind Direction 500QT-060A and Speed 500QT-050A\)](#)

Visible Emissions Source: HPGF A & B (A-59001A, A-59001B)

Observation Location: T (HPGF A)

Observation Picture:



**Observations**

		Clock Time	Observation Period (when you are actually looking at stack)	Emissions Observed (when you actually see smoke)
Begin	7/10/2024 16:45	0:20	15 minute intervals	0:00:00
				0:00:00
				0:00:00
				0:00:00
				0:00:00
				0:00:00
				0:00:00
				0:00:00
				0:00:00
End	7/10/2024 18:45	0:00		
Compliant? (Y/N)	Y		Y	

**General Notes**

Smoking was observed prior to the method 22 being performed. No smoking was observed during method 22.