



Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

January 29, 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 HP Ground Flare #1 Visible Emissions Malfunction Report

Dear Mr. Gorog,

Shell Chemical Appalachia LLC (“Shell”) is submitting this Malfunction Report to the Pennsylvania Department of Environmental Protection (PADEP) for visible emissions from the HP Ground Flare #1.

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 December 28, 2023, starting at approximately 11:19, visible emissions (VE) were present at the HP Ground Flare #1 (Totally Enclosed Ground Flare/TEGF A)¹. Smoking was generally light, gray to brown in color, and exceeded 5 minutes in less than a 2-hour period. The cause of the incident was determined to be low flare rates paired with high ethylene concentrations, yielding flare combustion temperatures which were not high enough to result in smokeless combustion. Note that there was no flaring event at the time the VE was observed.
- **Time when the malfunction or breakdown was first observed**
December 28, 2023 at 11:19
- **The date and time that the malfunction started and ended**
December 28, 2023 at 11:19 and ended at December 28, 2023 at 12:03
- **An estimate of the emissions associated with the malfunction**
No excess emissions. The malfunction is visible emissions only.

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

- 43 minutes and 52 seconds of VE observed between 11:19:31 and 12:03:23

¹ TEGF A is the site name for Source ID C205A HP Ground Flare #1 in PA-04-00740C

Method 22 observations were performed by operations, and the form is attached to this malfunction report (Attachment A).

- **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**
Flare stages and flare flow (via supplemental natural gas) were manually adjusted per existing operator instructions to manage flare VE.
- **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 ethylene concentrations and the TEGF A staging configuration at the time of the malfunction resulted in flare combustion temperatures which were not high enough to yield smokeless combustion. This is the same root cause identified for other similar malfunctions.
- **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**
As an interim solution and effective in the spring of 2023, operator instructions were created, distributed, and trained upon to mitigate VE from future similar occurrences. These instructions include guidance for manual switching of active TEGF stages and the introduction of supplemental gas in small increments to change overall vent gas composition, combustion temperatures, and promote increased air/fuel mixing in the TEGFs. These also include subsequent monitoring of the overall vent gas composition to identify when to return to normal automatic staging of the TEGFs. As described above, these instructions were followed once the VE was identified but the adjustments were not quick enough to stay under 5 minutes in a 2-hour period.

For long term solutions, please reference the corrective actions and timeline identified in the "SPM TEGF Repairs Report" submitted in accordance with the May 24, 2023, Consent Order and Agreement.
- **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 completed other than the long term TEGF repairs, which are subject to the timeline identified in the "SPM TEGF Repairs Report" submitted in accordance with the May 24, 2023, Consent Order and Agreement.

January 29, 2024

If you have any questions regarding this matter, please contact me at (724) 709-2825 or william.watson@shell.com.

Sincerely,

A handwritten signature in black ink, appearing to read "William Watson". The signature is written in a cursive, flowing style.

William Watson
Operations Manager

CC:
Scott Beaudway, Air Quality Specialist
Kristin Goddard, Environmental Compliance 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): 12/28/23 11:50
 Sky Conditions: Partly Cloudy
 Precipitation: None
 Wind Direction (direction from): E 70.15
 Wind Speed (m/s): 0.75
[Site MET Data \(Wind Direction 500QT-060A and Speed 500QT-050A\)](#)
 Visible Emissions Source: High Pressure Ground Flare A (A-59001A)
 Observation Location: S (HPEF)
 Observation Picture:
 No picture captured

Observations

		Clock Time	Observation Period (when you are actually looking at stack)	Emissions Observed (when you actually see smoke)
Begin	12/28/2023	0:20	<u>11:50</u>	<u>11:50:00</u>
				<u>12:00:00</u>
				<u>0:00:00</u>
				<u>0:00:00</u>
			15 minute intervals	<u>0:00:00</u>
				<u>0:00:00</u>
				<u>0:00:00</u>
				<u>0:00:00</u>
				<u>0:00:00</u>
				<u>0:00:00</u>
End	12/28/2023	13:50	<u> </u>	<u>0:00:00</u>
Compliant? (Y/N)		N	<u>N</u>	

General Notes

Observed frequent intermittent smoking during observation. Totaled more than 5 minutes, not compliant.