



Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

July 11, 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 205B HP Ground Flare #2 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 #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 June 17, 2024, starting at approximately 16:30, visible emissions (VE) were present at the HP Ground Flare #2 (Totally Enclosed Ground Flare/TEGF B)¹. Smoking was intermittent, gray 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 C3/C4 hydrocarbon concentrations, yielding flare combustion temperatures which were not high enough to result in smokeless combustion. Note that, at the time the VE was observed, there was no ongoing flaring event as defined in the site’s Flare Minimization and Management Plan.
- **Time when the malfunction or breakdown was first observed**
June 17, 2024 at 16:30
- **The date and time that the malfunction started and ended**
June 17, 2024 at 16:30 and ended at June 17, 2024 at 16:42.
- **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 B as determined by review of flare camera footage is captured below.

- 9 minutes and 41 seconds of VE observed between 16:30:04 and 16:42:17

¹ TEGF B is the site name for Source ID C205B HP Ground Flare #2 in PA-04-00740C

Method 22 observations were performed by operations, and the form is attached to this report.

- **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 were manually adjusted per existing operator instructions to manage the 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 C3/C4 hydrocarbon concentrations and the TEGF B staging configuration at the time of the malfunction resulted in flare combustion temperatures which were not high enough to yield smokeless combustion. Note that the elevated C3/C4 hydrocarbon concentration impact is the same as that of elevated ethylene concentration identified in some past TEGF smoking malfunction reports.

- **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 for future similar occurrences. These instructions include guidance for manual switching of active TEGF stages and, as needed, 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. The TEGF repairs were completed in June of 2024, with the TEGF B work occurring between June 19, 2024 and June 28, 2024.

- **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.

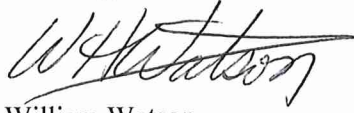
- **Corrective action is final or timeline for implementation**

Corrective actions are completed.

July 11, 2024

If you have any questions regarding this matter, please contact me Kimberly Kaal at kimberly.kaal@shell.com or me at william.watson@shell.com.

Sincerely,

A handwritten signature in black ink, appearing to read "W. 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): 6/17/24 18:30
 Sky Conditions: See Notes
 Precipitation: Rain
 Wind Direction (direction from): S 187
 Wind Speed (m/s): 7.64
[Site MET Data \(Wind Direction 500QT-060A and Speed 500QT-050A\)](#)
 Visible Emissions Source: High Pressure Ground Flare B (A-59001B)
 Observation Location: R (HPGF A/HPGF B)
 Observation Picture: Picture from west side of flare area



Observations

		Clock Time	Observation Period (when you are actually looking at stack)	Emissions Observed (when you actually see smoke)
Begin	6/17/2024	16:34:00	16:34:00	16:34:00
	6/17/2024	16:44:00	16:44:00	16:40:00
	6/17/2024	16:50:00	16:50:00	0:00:00
	6/17/2024	17:00:00	17:00:00	0:00:00
	6/17/2024	17:30:00	17:30:00	0:00:00
	6/17/2024	18:00:00	18:00:00	0:00:00
	6/17/2024	18:15:00	18:15:00	0:00:00
				0:00:00
End	6/17/2024	18:34	18:34	0:00:00

Compliant? (Y/N) N

General Notes

Observed Emissions for 2 hours. Observations started by day shift operator and finished by night shift operator. Sky was cloudy and it was raining at the time. TEGF was smoking for approximately 5 min and then was clear for the two hour period.