REGION 5
CHICAGO, IL 60604

MEMORANDUM

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
INEOS Nitriles USA LLC, Lima, Ohio

FROM: Matthew Walters, Environmental Engineer
AECAB (MN/OH)

THRU: Brian Dickens, Section Supervisor
AECAB (MN/OH)

TO: File

BASIC INFORMATION

Facility Name: INEOS Nitriles USA LLC

Facility Location: 1900 Fort Amanda Road, Lima, Ohio

Date of Inspection: November 7, 2023

EPA Inspector(s):
1. Matthew Walters, Environmental Engineer
2. Karyn DeFranco, Environmental Engineer
3. Veronica Fischer, Environmental Engineer

Other Attendees:
1. Joseph Bianco, SHE Manager, INEOS
2. Eugene Paik, Environmental Engineer, INEOS
3. Katie Saum, Engineering Technology Manager, INEOS (opening conference only)

Contact Email Address: joseph.bianco@ineos.com, eugene.paik@ineos.com

Purpose of Inspection: To investigate compliance with Title V Permit HAP and criteria air pollutant emissions limits (Permit No. P0132389)

Facility Type: Acrylonitrile, acetonitrile, and hydrogen cyanide manufacturing facility

Regulations Central to Inspection: Hazardous Organic NESHAP (HON) at 40 C.F.R. Part 63, Subparts F, G, and H and Ohio SIP

Arrival Time: 9:05 a.m.
Departure Time: 1:05 p.m.

Inspection Type:
☒ Unannounced Inspection
☐ Announced Inspection

OPENING CONFERENCE

☒ Presented Credentials
☒ Stated authority and purpose of inspection
☒ Small Business Resource Information Sheet not provided. Reason: Not a small business
☒ Provided CBI warning to facility

The following information was obtained verbally from INEOS personnel unless otherwise noted.

Process Description:

INEOS Nitriles USA LLC (INEOS) is a chemical manufacturing facility in Lima, OH that operates 24/7 (the facility). The facility reacts ammonia and propylene raw materials in air within two parallel fluidized catalytic bed reactors to produce acrylonitrile (AN), along with acetonitrile (ACN) and hydrogen cyanide (HCN) co-products. The reactor effluent gas is quenched and then passed through the Absorber to capture the reaction products. The Absorber emissions are controlled by the Absorber Off-gas Incinerator (AOGI). The AOGI bypass vent, which can divert absorber off-gas to the atmosphere, is monitored with a flow meter. The reactors, Absorber, and AOGI are grouped into permitted Emissions Unit (EU) P035.

The rich aqueous stream from the Absorber is routed to the AN recovery and purification section, which separates ACN and purifies the AN and HCN products (EU P075). The ACN-containing stream is further purified and reacted in the Light Ends Column and Aceto Digester (EU P074), followed by additional recovery and purification steps (EU P048). Emissions from various equipment in EUs P075, P074, and P048 are controlled by a closed vent system and steam assisted flare. Excess HCN and HCN vent streams are routed to the HCN thermal oxidizer, with the steam assisted flare serving as a backup. The facility has HCN storage capacity for approximately half a day of production.

Process wastewater is hard piped to the treatment process for solids removal. The facility typically generates 380-420 gal/min of wastewater. Wastewater typically contains 4.5% ammonia sulfate and 0.5% organic or less, and wastewater tanks are vented to either the AOGI or flare. The facility disposes of treated wastewater in underground injection wells (deepwells). Two Deepwell Surge Tanks (one fixed roof, one internal floating roof) store treated wastewater prior to injection. The Deepwell Surge Tanks vent to the atmosphere.

The facility primarily distributes AN product by rail car, with a small percentage of AN shipped by tanker truck. ACN product is only distributed by rail car. HCN is transported via pipeline to an adjacent facility.

Staff Interview:

- The excessive AOGI CEMS downtime referenced in the February 3, 2022 Notice of Violation issued by Ohio EPA was related to a long-duration outage of the stack flow measurement used to convert concentrations to mass flowrates. The CO and NOx sensors remained functional to provide concentration data. Ohio EPA approved the use of process data to determine stack flow on an interim basis, and the facility identified a new manufacturer that replaced the failed flow sensor.
- The facility uses a contractor for LDAR monitoring. The contractor maintains the LDAR database, and INEOS has access to the database.
- The facility primarily uses dual seal and sealless pumps. The LDAR contractor performs weekly/monthly inspections required by the HON for pumps in light liquid service, and INEOS performs per-shift pump inspections.
- An AOGI bypass event occurred on October 26, 2023. INEOS is preparing a SARA 304 report on the incident, but the report has not yet been submitted.

TOUR INFORMATION

EPA Tour of the Facility: Yes

Data Collected and Observations:

- Title V Permit condition C.7(c)(2)(a) requires the flare controlling EUs P075, P074, and P048 to be operated with no visible emissions, except for periods not to exceed a total of five minutes during any two consecutive hours. Inspectors did not observe visible emissions from the flare at the time of the inspection.
- Title V Permit condition C.7(d)(2)(b)(i) requires a device capable of continuously detecting the presence of a pilot flame to be used at the flare controlling EUs P075, P074, and P048. Inspectors observed video of the flare flame in the control room that serves as a backup to the thermocouple monitoring system for flame confirmation.
- Title V Permit condition C.10(c)(2) requires the permittee to identify each piece of equipment subject to 40 CFR, Part 63, Subpart H and monitor it in accordance with the requirements of Subpart H. Inspectors observed LDAR contractors onsite at the time of the inspection and noted that equipment throughout the facility was labeled with LDAR tags. Inspectors requested LDAR records for later review.
- 40 C.F.R. § 63.167(a)(1) requires each open-ended valve or line subject to Subpart H to be equipped with a cap, blind flange, plug, or a second valve. Inspectors did not observe any open-ended valves or lines that were missing a cap, blind flange, plug, or second valve.

- All blowdown lines are routed to the wastewater treatment process through closed piping. Inspectors did not observe any individual drain system openings that would require monitoring and control under 40 C.F.R. § 63.136. Inspectors requested a wastewater flow diagram and documentation of wastewater group determinations for later review.
- Inspectors performed optical gas imaging using a FLIR camera to visualize emissions from process equipment and made the following observations:
    - No emissions were visualized at the East Deepwell Surge Tank (internal floating roof). The West Deepwell Surge Tank (fixed roof) was down for maintenance at the time of the inspection.
    - No emissions were visualized at AN Product Tank 1. AN Product Tank 2 was down for maintenance at the time of the inspection.
    - Emissions were visualized at the AOGI stack, flare for EUs P075, P074, and P048, and ammonia recovery column flare (EU P077). The most recent AOGI stack test report and potential to emit calculations for the EU P077 flare were requested for later review.
    - Emissions were visualized above Tank 4, which holds AN product for quality control before the product tanks.

Photos and/or Videos: were taken during the inspection.

See FLIR video log at Appendix A.

RECORDS REVIEW

1. AN2 Simplified Process Flow Diagram
2. Acetonitrile Purification Flow Diagram (Figure 1 and 1A)
3. Catalyst Manufacturing Plant Flow Diagram

Copies of the records listed above were retained by Inspectors.

CLOSING CONFERENCE

☒ Provided U.S. EPA point of contact to the facility

Requested documents:

- List of tank inventories
- September 2022 AOGI stack test report
- Most recent Title V permit application
- Most recent annual Title V compliance certification
- Wastewater flow diagram and documentation of wastewater group determinations
- Alternative monitoring request submitted to Ohio EPA for AOGI flowrate
- Quarterly deviations reports for the past 3 years

- LDAR database records for the past 2 years
- P&IDs for the Aceto Digester and associated equipment
- Annual actual emissions calculations for the past 2 years
- Potential to emit calculation for the flare classified as an insignificant source
- Quarterly sampling analysis for the Aceto Cooling Tower for the past two quarters
- Report prepared for the 10/26/2023 AOGI bypass event

DIGITAL SIGNATURES

Report Author: MATTHEW WALTERS Digitally signed by MATTHEW WALTERS Date: 2024.01.04 08:16:32 -06'00'

Section Supervisor: BRIAN DICKENS Digitally signed by BRIAN DICKENS Date: 2024.01.04 09:09:33 -06'00'

APPENDICES

A. FLIR Video Log

APPENDIX A: FLIR VIDEO LOG

1. **Inspector Name:** Veronica Fischer	2. **Archival Record Location:** R5 Electronic Record Center

Video Number	File Name	Date and Time (EST)	Description of Video
1	FLIR0024.mp4	11/7/2023 10:52	Overall view of facility from North Gate
2	FLIR0025.mp4	11/7/2023 10:58	Overall view of facility from North Gate
3	FLIR0026.mp4	11/7/2023 11:21	AOGI Stack
4	FLIR0027.mp4	11/7/2023 11:24	Ammonia recovery column flare (EU P077)
5	FLIR0028.mp4	11/7/2023 11:25	Flare for EU P075, P074, and P048
6	FLIR0029.mp4	11/7/2023 11:29	Ammonia recovery column flare (EU P077)
7	FLIR0030.mp4	11/7/2023 11:32	AOGI Stack
8	FLIR0031.mp4	11/7/2023 11:53	Ammonia recovery column flare (EU P077) and AOGI Stack
9	FLIR0032.mp4	11/7/2023 11:57	Tank 4
10	FLIR0033.mp4	11/7/2023 11:57	Tank 4
11	FLIR0034.mp4	11/7/2023 12:04	ACN Cooling Tower
12	FLIR0035.mp4	11/7/2023 12:22	Aceto Knock-out Pot