

## **Ethylene oxide: Technical Reviews and Outreach to Potentially Affected Communities**

### **Status Report — Lanxess, Charleston, S.C.**

As EPA pursues its mission to protect public health and the environment, addressing ethylene oxide (EtO) remains a major priority for the Agency. EPA's National Air Toxics Assessment (NATA), released in August 2018, identified a number of areas (census tracts) with potentially elevated risk from continuous exposure, over 70 years, to EtO in the outdoor air. NATA estimated these risks based on EtO emissions from 2014, which were the most recently available at the time.

NATA is a screening-level analysis that is intended to identify pollutants or areas for closer examination. Because of this, additional work is needed to better understand emissions in areas that NATA identified as potentially having elevated risk. EPA has been supporting its state air agency partners as they conduct that work and identify opportunities for reducing EtO emissions from individual facilities, while the Agency reviews its national regulations for industrial facilities that emit EtO. Actual risks today may be higher or lower than NATA estimated due to several factors, including updated or more refined facility emissions information, or recent facility changes such as the installation of pollution controls.

The information below describes the technical analyses conducted for the Lanxess facility in Charleston, S.C. as part of the follow-up work conducted since NATA was issued in August 2018. It also summarizes outreach to nearby communities about the NATA results. EPA is providing this information, in part, in response to the EPA Office of Inspector General's March 31, 2020, Management Alert which called on EPA to provide information to the 25 communities that NATA identified as potentially having the highest risk from EtO emissions.

#### **Technical reviews conducted**

##### **Permit Reviews**

- Permits issued by SC DHEC can be found at <https://apps.dhec.sc.gov/Environment/PermitCoverage/>.

##### **Controls Installed and Emissions Reduced**

- The Risk and Technology Review (RTR) amendments to the Miscellaneous Organic Chemical Manufacturing (MON) rule, which became effective August 12, 2020, impose a compliance date of August 12, 2022 for process vents, storage tanks, and equipment that are in ethylene oxide service, as well as new requirements for other portions of the Lanxess/Charleston facility. The facility is expected to install new controls to comply with the amendments, but none have been installed yet. The rulemaking can be found at: <https://www.epa.gov/stationary-sources-air-pollution/miscellaneous-organic-chemical-manufacturing-national-emission>.

### **Emissions Inventory**

- EPA Region 4 staff will evaluate any new emissions data submitted by the State to the EPA's emissions inventory system on an ongoing basis. Emissions inventory work performed by OAR/OAQPS as part of the MON RTR are described the link above.

### **Modeling**

- Modeling performed by OAR/OAQPS as part of the MON RTR are described the link above.

### **Ambient Monitoring**

- SC DHEC collects ambient air grab samples near the facility approximately every month.
- In September 2020, SC DHEC was one of 11 air monitoring projects to be selected to focus on air toxic pollutants such as EtO. With this funding (\$261,128), SC DHEC plans to work with the North Charleston community to implement plans for monitoring and characterizing concentrations of ethylene oxide in the North Charleston area, including in the surrounding environmental justice communities.
- EPA provided monitoring technical support to SC DHEC in October 2020.

### **Risk Assessment**

- Risk Analysis performed by OAR/OAQPS as part of the MON RTR which can be found at <https://www.epa.gov/stationary-sources-air-pollution/miscellaneous-organic-chemical-manufacturing-national-emission>.

### **Inspections**

- August 21 – 28, 2018, a wastewater inspection with sampling regarding requirements of the MON was conducted by EPA Region 4 Air Enforcement and National Enforcement Investigations Center inspectors.
- February 11 – 13, 2019, Region 4 Enforcement and Compliance Assurance Division (ECAD) and Laboratory Services and Applied Science Division (LSASD) inspectors conducted a leak detection and repair (LDAR) monitoring inspection at Lanxess. The inspection was halted because of a cooling valve failure and subsequent process shutdown.
- May 20 – 22, 2019, Region 4 ECAD and LSASD inspectors conducted another LDAR inspection at Lanxess. Inspectors found a total of three leaks above the regulatory leak definition at the Organic Specialties Unit. Inspectors found another leak above the regulatory leak threshold at the BriQuest Unit but monitoring at that unit was halted due to a chlorine gas release and shelter in place at the facility.
- On July 16, 2020, Region 4 ECAD's Air Enforcement Branch sent a letter outlining areas of concern from the various inspections conducted and information collected from the facility and requested a meeting. ECAD met with Lanxess representatives on October 2, 2020, to discuss the areas of concern.

### Analytical Support

- On June 3, 2019, Lanxess began stack testing pursuant to an OAQPS Section 114 request to gather information for the MON NESHAP RTR proposal. OAQPS and SC DHEC staff were on site to observe. The stack test consisted of sampling the inlets and outlets of three scrubbers and the outlet of the process' common stack.

Test Location	Average EtO Concentration	Scrubber Efficiency (%)
C-202 Scrubber Outlet	0.76 ppmvd	99.999
Train 1 Scrubber Outlet	75.6 ppmvd	32.6
Train 3 Scrubber Outlet	14.3 ppmvd	53.1
OSU Stack	14.1 ppmvd	N/A

- October 25, 2019, Lanxess contacted ECAD staff to discuss optimization and efficiency changes to the Train 1 and Train 3 scrubbers at the facility.
- A stack test was performed, and EPA was provided with the results.

### Regulatory changes

- Pursuant to a court order, on August 12, 2020, EPA published the final rule for the “Residual Risk and technology (RTR) review for Miscellaneous Organic Chemical Manufacturing (MON) source category regulated under the National Emission Standards for Hazardous Pollutants (NESHAP). The amendments will address equipment leaks and heat exchange systems, EtO emissions from storage tanks, process vents and equipment leaks. As an industrial source of EtO, Lanxess Corporation’s facility in Charleston, SC, will be subject to the new rule with respect to risk and control technology requirements.

### Outreach conducted:

- Region 4 closely coordinates with SC DHEC to provide information to the public and government officials on air emissions of EtO, particularly from the Lanxess facility in North Charleston, South Carolina.
- Region 4 provides updates to stakeholder email lists, as they become available (e.g., posting of the Commercial Sterilizer ANPRM).
- Region 4 emails updates to members of the congressional delegation and elected officials as updates are made. In addition to these emailed updates, informal briefings are offered.
- Region 4 provides any regulatory updates directly to SC DHEC who then provides updates to the community.
- SC DHEC’s public facing EtO webpage is here: <https://www.scdhec.gov/environment/air-quality/national-air-toxics-assessment-and-ethylene-oxide>
- On December 2, 2019, along with SC DHEC, EPA Region 4 attended a meeting for the communities in the vicinity of the Lanxess facility and hosted by the Lowcountry Alliance for Model Communities. (SCDHEC had reached out previously to LAMC about the EtO issue.)
  - SC DHEC provided an update on EtO, particularly as it relates to the Lanxess facility.

- EPA did not present but was available to answer questions as needed.
- The discussion focused on the prior week's phosphorous fire at Lanxess and the need for better emergency communications with community. (An earlier public meeting on Lanxess with adjacent communities had been planned to discuss EtO but was canceled due to Hurricane Dorian.)