

Questions and Answers  
Virtual Ethylene Oxide Community Meeting in Port Neches, Texas near the  
Indorama Ventures Facility  
August 17, 2021

*NOTE: Questions and answers are grouped by topics.*

**Meeting Logistics**

Q: Will the presentation be available after this meeting?

A: A verbal response was provided during the meeting. EPA will post a copy of the presentation and a copy of the transcript on the EPA Region 6 Texas EtO website:  
<https://www.epa.gov/tx/air-issues-texas#4>.

Q: Is the meeting being recorded?

A: Yes. The meeting is being recorded.

**EPA and TCEQ EtO Risk Screening Levels**

Q: Can you first please explain why there's such a significant difference in the values between EPA and TCEQ and what reviews have been done on these values, to ensure the reliability of the numbers?

Q: Can you please explain why the IRIS value is 19,000 times lower than the normal naturally created levels of ethylene oxide in the human body and orders of magnitude lower than levels of ethylene oxide from other sources, measured in ambient air?

A: A verbal response was provided during the meeting, but we can add the following:

TCEQ developed a state-specific health risk screening level for ethylene oxide which is considerably different than the EPA IRIS level. TCEQ has the right to develop their own health effects screening levels under state law. Regarding the risk screening level for EtO, we disagree with the numbers presented. EPA is proceeding with ethylene oxide activities and outreach based on the EPA ethylene oxide inhalation risk screening level.

Both EPA and TCEQ rely on the same major CDC studies for the epidemiological information. But EPA and TCEQ had two major differences in the methodologies to determine risk from those studies. First, EPA's IRIS value for EtO includes risk for lymphoid cancers in both men and women and breast cancer in women. TCEQ did not use the information associated with risk for breast cancer in women in their risk screening level determination. Second, according to the Agency's Science Advisory Board (SAB), EPA's IRIS value for EtO is based on a statistical model that best estimates the excess cancers in people living around EtO-emitting facilities based on the worker exposure data. Note, the SAB rejected the statistical model selected by TCEQ.

**Background Ethylene Oxide**

Q: What does the EPA intend to do about the background ethylene oxide it says that it's picking up which may not be from Indorama?

A: A verbal response was provided during the meeting, but we can add the following:

EPA has been studying background concentrations of ethylene oxide. Background concentrations represent the amount of a pollutant that exists in the air that does not come from a specific source. These pollutants may come from a natural source or from distant sources. Background concentrations can explain pollutant concentrations found even without recent human-caused emissions.

We are evaluating background concentrations of ethylene oxide from monitors across the nation, in urban and rural areas, that are not associated with a particular industry. EPA is also working to understand other sources of ethylene oxide emissions that may influence the results from those monitors. Right now, we don't know what background levels are for ethylene oxide – we can't put an exact number on it. Measuring ethylene oxide is challenging – especially at lower concentrations.

More information can be found at: <https://www.epa.gov/system/files/documents/2021-10/background-eto-explainer-document.pdf>

Q: EPA mentioned that there are non-Indorama associated off-site readings. Has EPA determined the source of these emissions or readings and what actions will be taken to protect the public?

A: A verbal response was provided during the meeting, but we can add the following:

Right now, we do not have adequate information about the amount of background ethylene oxide in the air. EPA is working on improvements to the monitoring method that will help us better measure ethylene oxide at low levels. Learning more about background ethylene oxide will help us develop a more complete picture of risks.

Q: Is there any background EtO in Port Neches or Indorama the primary source of EtO?

A: A verbal response was provided during the meeting, but we can add the following:

EPA does not have any monitoring data on EtO levels in the Port Neches area. Based on the 2014 NATA and the 2018 EPA risk assessment update, the area around the Indorama is the only area in Port Neches with estimated *excess* cancer risks over 100 in a million due primarily to EtO.

### **Risk Assessment**

Q: There are many houses and schools within close proximity to Indorama. Does the EPA understand just how close they are, like literally across the street? I live about a mile away.

A: A verbal response was provided during the meeting, but we can add the following:

EPA uses census block centroids when evaluating long-term exposures, which typically represent about 40 people or 10-15 households. We also examine aerial images prior to our risk assessment to ensure the census block centroids are representative of where people live. If a census block centroid is not representative, EPA either moves the centroid or adds additional receptors, which are the points where our air models calculate concentrations and, ultimately, risk levels.

Q: What is “in 1 million”?

A: A verbal response was provided during the meeting, but we can add the following:

A cancer risk level of 1-in-1 million implies that, if 1 million people are exposed to the same concentration of a pollutant continuously (24 hours per day) over 70 years (an assumed lifetime), one person would likely contract cancer from this exposure. This risk would be in addition to any cancer risk borne by a person not exposed to these air toxics.

Q: What is the risk around Indorama in 2020?

A: A verbal response was provided during the meeting, but we can add the following:

EPA has not yet assessed the estimated excess cancer risk based on 2020 emissions. Indorama's presentation included a 2020 risk estimate based on preliminary 2020 EtO emissions data. Indorama predicted an estimated excess cancer risk of 683 in a million using EPA's EtO risk screening number.

EPA has not yet received, quality assured, or quality controlled the emissions inventory data from state agencies and/or facilities that are needed to assess 2020 inhalation excess risk from air toxics.

EPA's plans for future national risk evaluations of facility air toxics emission data can be found on the following webpages:

<https://www.epa.gov/newsreleases/epa-improve-access-transparency-and-timeliness-air-toxics-data-and-risk-information>

[Improving Access to Air Toxics Data | US EPA](#)

<https://www.epa.gov/system/files/documents/2021-08/air-toxics-data-update-overview-final.pdf>

### **Health Risk Exposures; Cancer Endpoint; At What Distance from a Source of Eto and at What Concentration?**

Q: Were you saying that the risk had dropped below the acceptable risk level?

A: A verbal response was provided during the meeting, but we can add the following:

Based on 2018 data, EPA reassessed and updated the estimated inhalation public health risk from hazardous air pollutants, including EtO, in the community near Indorama. Our results indicate the estimated maximum individual cancer risk (the single highest estimated additional cancer risk for an individual in the area) increased about 37 percent from the previous NATA risk estimate based on 2014 emissions (from 1,456 in 1 million to 2,000 in 1 million). The 2018 risk assessment update for Indorama can be found at:

<https://www.epa.gov/system/files/documents/2021-07/region-6-risk-assessment-of-ethylene-oxide-emitting-facilities-in-texas-and-louisian-jul-8-2021.pdf>.

The revised estimated 2018 maximum individual cancer risk is well above 1 in 10,000. Adding "upset" emissions (emissions released to air due to accidental or unavoidable circumstances at industrial facilities) to the risk assessment dramatically increased the updated risk estimate. In 2020, Indorama reported only one small emissions event. However, in 2021 multiple emissions events (an upset event or unscheduled maintenance, startup, or shutdown activity that results in the unauthorized emissions of air toxics) have been reported by Indorama to the TCEQ air emissions event report database. EPA remains concerned that problems with "upsets" at the facility may not be completely resolved.

Preliminary 2020 annual EtO emissions are about 72 percent less than the 2018 EtO emissions assessed by EPA. However, there were virtually no facility upsets involving EtO in 2020; several EtO emission upsets have occurred already in 2021.

Q: Please clarify, are you saying that 70 years of exposure for 24 hours per day at a threshold below that, at which EtO naturally occurs in the environment is assessed for carcinogenicity?

A: A verbal response was provided during the meeting, but we can add the following:

Details on how the 2018 risk assessment update was completed can be found in the following report: <https://www.epa.gov/system/files/documents/2021-07/region-6-risk-assessment-of-ethylene-oxide-emitting-facilities-in-texas-and-louisian-jul-8-2021.pdf>.

Q: Did EPA scientists create this risk assessment and did EPA assess the risk, based on the emissions the source is allowed to release or only based on the estimated risk from reported emissions?

A: A verbal response was provided during the meeting, but we can add the following:

EPA used data from the 2018 National Emissions Inventory (NEI) on reported actual emissions, in conjunction with revisions from Region 6 and the states, to estimate cancer risks and noncancer hazards from potential exposure to the reported hazardous air pollutants.

Q: How is the government able to make assumptions that an invisible virus is only airborne indoors for approximately three hours but when risk assessing EtO, it is assumed to be airborne at maximum emissions quantity for 70 years?

A: A verbal response was provided during the meeting, but we can add the following:

EPA's modeled risks are based on actual emissions data reported to us by facilities. In a risk assessment, we assume that the facilities continue to emit the air toxic at the same rate every year over a 70-year lifetime. So we don't assume that it's one year's emissions that stay in the air for 70 years.

### **EtO Emissions Information**

Q: How accurate is the emissions inventory?

A: A verbal response was provided during the meeting, but we can add the following:

Emissions information is provided to EPA by the states through their emissions inventory and directly by facilities through the Toxic Release Inventory (TRI) program. Both of these programs have quality assurance and control procedures for the emissions data they receive and post online for public access.

Q: Regarding process facility upset increases, will EPA initiate a review of process procedures and monitor efforts at reducing such incidents?

A: A verbal response was provided during the meeting, but we can add the following:

EPA plans to continue to monitor the facility for "upsets" involving EtO emissions, evaluate if historical problems with "upsets" have been resolved, and continue to monitor Indorama's progress with reduction of EtO emissions.

Q: Where were there unreported upsets? If so, how many?

A: A verbal response was provided during the meeting, but we can add the following:

EPA cannot comment on whether there were or were not potential upsets that were not reported by Indorama. EPA Region 6 used the TCEQ emission event report database and checked the NRC database for our EtO event information on Indorama.

Q: How much ethylene oxide was released in the NRC report ID number 1299141 dated 2/26/2021 due to the freeze?

A: The NRC database is administered by the U.S. Coast Guard. Another resource for details on the specific upset reported on August 26, 2021 is TCEQ. TCEQ air quality emission event incident numbers that involved ethylene oxide around that date related to the freeze are 350679, 350947, and 351681 and can be found online on the TCEQ website.

These TCEQ air emission event reports can be found at these weblinks:

<https://www2.tceq.texas.gov/oce/eer/index.cfm?fuseaction=main.getDetails&target=350679>,  
<https://www2.tceq.texas.gov/oce/eer/index.cfm?fuseaction=main.getDetails&target=350947> and  
<https://www2.tceq.texas.gov/oce/eer/index.cfm?fuseaction=main.getDetails&target=351681>.

### **Fenceline or Ambient Air Monitoring for EtO**

Q: Has EPA implemented, or will EPA implement, fenceline monitoring or ambient air monitoring for ethylene oxide on other sources? If so, when?

A: A verbal response was provided during the meeting, but we can confirm the following:

At this time, we are not scheduled for either ambient air monitoring or fenceline monitoring in the Port Neches area. There are no current EPA regulatory requirements for the source to conduct either fenceline or ambient monitoring for ethylene oxide. EPA does intend to assess the applicability of monitoring requirements as part of its upcoming review of ethylene oxide emission standards for several source categories.

Q: Will EPA implement fenceline monitoring or ambient air monitoring for ethylene oxide near this source and, if so, when and how can the public assess the monitoring data?

A: A verbal response was provided during the meeting, but we can confirm the following:

At this time, we are not scheduled for either ambient air monitoring or fenceline monitoring in the Port Neches area. There are no current EPA regulatory requirements for the source to conduct either fenceline or ambient monitoring for ethylene oxide. EPA does intend to assess the applicability of monitoring requirements as part of its upcoming review of ethylene oxide emission standards for several source categories.

Q: Has either EPA Region Six or TCEQ conducted recent ambient air monitoring at Indorama?

A: A verbal response was provided during the meeting, but we can confirm that no recent ambient air monitoring has been conducted by EPA or TCEQ near Indorama.

Q: Have the neighborhood's been monitored? Has EPA use its TAGA vehicle to perform ETA EtO monitoring at Indorama?

A: A verbal response was provided during the meeting, but we can confirm that no recent ambient air monitoring has been conducted by EPA or TCEQ near Indorama. EPA's current air monitoring methods, including those on the TAGA, are not sufficiently sensitive enough to properly monitor for ethylene oxide. Research is underway to improve EPA's air monitoring methods for measurements of ethylene oxide.

Q: What air monitoring methodology is the EPA using for EtO and what monitoring methods for ethylene oxide exist?

A: EPA has prepared a paper which provides more information on the agency's work to understand background levels of ethylene oxide, which can be found at:  
<https://www.epa.gov/system/files/documents/2021-10/background-eto-explainer-document.pdf>

### **Facility or Regulatory Agency Actions**

Q: Indorama said it has reduced emissions at its facility. Precisely what did it do to reduce those emissions or was it just a change in the way they go about doing production?

A: A verbal response was provided during the meeting, but we can add the following:

A summary of these actions was shown on the EPA presentation slides and discussed in the question and answer session during the community meeting call. More details can be found in the technical assessment report which can be found at:

<https://www.epa.gov/system/files/documents/2021-07/technical-assessment-report-indorama-jun-24-21-rev-jul-28-21.pdf>

Q: Given the hazards of EtO, will Indorama address fugitive source emissions at the facility?

A: A verbal response was provided during the meeting, but we can add the following:

More details are included in the technical assessment report which can be found at:

<https://www.epa.gov/system/files/documents/2021-07/technical-assessment-report-indorama-jun-24-21-rev-jul-28-21.pdf>

Q: As this information shows that cancer risk is unacceptable from this facility, what action has EPA taken, or does EPA plan to take to reduce the emissions of ethylene oxide from this source?

A: A verbal response was provided during the meeting, but we can add the following:

The revised estimated 2018 maximum individual excess cancer risk is estimated to be above 100 in a million.

EPA plans to continue to monitor the facility upsets involving EtO, to evaluate if historical problems with upsets have been resolved and continue to monitor Indorama's progress with reduction of EtO emissions. Additionally, EPA committed in our March 5, 2021 response to the Office of the Inspector General to complete a thorough review of several NESHAP that apply to this facility, and we intend to consider EtO emissions as part of this review.

### **Commercial Sterilizers**

Q: Why isn't EPA having any meetings on the sterilizers that emit ethylene oxide in our community? These are discussed in the EPA Office of Inspector General's 2020 and 2021 reports.

A: A verbal response was provided during the meeting, but we can add the following:

EPA is taking a closer look at regulations to address ethylene oxide emissions at commercial and hospital sterilizers. The agency anticipates issuing a proposed rule for commercial sterilizers in 2022. EPA expects to begin meetings to discuss emissions from sterilizers in conjunction with this rulemaking. More information can be found at: <https://www.epa.gov/stationary-sources-air-pollution/ethylene-oxide-emissions-standards-sterilization-facilities>.

### **Permitting/Compliance**

Q: Has the permit been violated?

A: EPA verbally deferred responding to compliance or permitting questions during the community meeting. The Texas Commission on Environmental Quality (TCEQ) is delegated by EPA to implement EPA air quality programs in Texas as serves as the primary permitting and enforcement authority in the State of Texas. EPA also has the ability to enforce the State's air permits as well. Both entities have the ability to inspect and enforce any documented violations at the facility. Questions regarding permitting or compliance issues should be sent to TCEQ.

Q: Does EPA post the annual inspections of the plant by the TCEQ?

A: A verbal response was provided during the meeting, but we can confirm that EPA does not post reports of inspections conducted by TCEQ. Requests for TCEQ inspection reports should be sent to TCEQ.