



# ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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## Responsiveness Summary for Public Questions and Comments on a Construction Permit Application from Vantage Specialties, Inc., Gurnee

Source ID No.: 097035AAQ

Application No.: 19100015

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## **DECISION**

On December 17, 2019, the Illinois EPA issued Construction Permit 19100015 to Vantage Specialties, Inc., for its plant located at 3938 Porett Drive in Gurnee, Illinois. The primary purpose of this construction permit is to impose an annual cap on ethylene oxide emissions as required under a recently enacted law. This document is a Responsiveness Summary prepared by the Illinois EPA in conjunction with the issuance of this construction permit.

## **BACKGROUND**

Vantage Specialties, Inc. (Vantage) manufactures ingredients used in personal care, food and industrial products. The reactors in the alkoxylation area of the plant use ethylene oxide as a raw material. The ethylene oxide is piped into sealed reactors along with other raw materials. The ethylene oxide reacts with the other raw materials to form the desired chemical products. This consumes the ethylene oxide with only a small amount of unreacted ethylene oxide left, which is then vented to a scrubber followed by a dry bed absorption device. This dry bed device was installed in April 2019 to further reduce emissions.

Ethylene oxide is received at the plant in pressurized railroad tanks cars that are built and rated for transport of ethylene oxide. The ethylene oxide is transferred to a pressurized storage tank that is vapor-balanced with the railcar during unloading, with displaced vapor returned to railcar and not vented.

Piping for the unloading of railcars, the storage tank and the alkoxylation area includes components such as pumps, pressure relief devices, valves, connectors and flanges that can be sources of fugitive emissions of ethylene oxide. Under state and federal rules, the components containing ethylene oxide are subject to requirements for periodic operational monitoring to identify leaks and requirements for timely repair of any leaks. Since May 2019, Vantage has implemented an enhanced leak detection and repair program, which has served to further reduce fugitive emissions.

Vantage has applied for a construction permit that would set an annual cap on emissions of ethylene oxide from the plant as required by Public Act 101-0023, which took effect June 21, 2019. The Illinois EPA, Bureau of Air has drafted a permit that would set an annual cap on emissions of ethylene oxide from the plant of 110 pounds per year, of which no more than 60 pounds may be fugitive emissions from components. The permit would also include conditions that would address how compliance with the cap on emissions is to be determined, including requirements for monitoring, recordkeeping and reporting. This permit would act to control or reduce ethylene oxide emissions from the plant.

## **OPPORTUNITY FOR PUBLIC COMMENTS**

Recognizing the significant public interest in this construction permitting action, the Illinois EPA afforded a public comment period, with public meeting, on the matter to allow the public to submit comments on the draft construction permit. The Illinois EPA borrowed from a historical practice of offering the public an opportunity to meet with representatives of the Illinois EPA in advance of the permitting of a project of significant interest. To ensure that the public benefited from an orderly process that facilitated public comment, the Illinois EPA made use of the hallmarks of a traditional informational hearing for the meeting. This included preparation of a draft permit, a public notice for the meeting, a panel of Illinois EPA staff at the meeting to hear comments and receive questions, a transcript of the meeting, the opportunity for people to submit written comments following the meeting, and this written response to all significant permit-related comments raised at the meeting and during the comment period.

For the benefit of readers, public comments and questions are shown in conventional text with responses shown in boldface. Also, comments and questions are paraphrased, grouped and arranged by subject matter.

## **AVAILABILITY OF DOCUMENTS**

Copies of the construction permit that has been issued, as well as this Responsiveness Summary, are available electronically at:

<https://www2.illinois.gov/epa/topics/community-relations/sites/ethylene-oxide/Pages/default.aspx>

Printed copies of these documents are also available free of charge by contacting Mr. Brad Frost in the Office of Community Relations by telephone, 217-782-7027.

Copies of these documents may also be obtained by contacting the Illinois EPA at the telephone numbers listed at the end of this document.

## **QUESTIONS AND COMMENTS WITH RESPONSES BY THE ILLINOIS EPA**

### **General Questions and Comments on the Permit**

1. How much time will Vantage have to complete the necessary changes to the facility or has it already completed all the construction?

**The construction permit does not address construction of further improvements to the emission control measures at the facility, i.e., the portions of the plant where ethylene oxide is used or present and may be emitted. Vantage has already installed a dry bed absorber device in the control system for emissions from process equipment improving the control of process emissions. It also has been implementing an enhanced leak detection monitoring program for fugitive emissions from components since May. The**

**purpose of the construction permit is to satisfy requirements of the new Illinois law that addresses emission of ethylene oxide from the Vantage facility, Public Act 101-0023, as adopted by the 101<sup>st</sup> Session of the Illinois General Assembly. In particular, this new law requires that Vantage be subject to a permit issued by the Illinois EPA that imposes a site-specific annual cap on emissions of ethylene oxide of the facility that is set to protect public health. This new law also requires that this permit must provide that it may be reopened by the Illinois EPA if it is determined that the emissions from the facility pose a risk to public health.**

2. Was the application for construction permit required?

**Yes, the recently enacted law required that the source “obtain a permit that imposes a site-specific annual cap on ethylene oxide emissions.” It was for this purpose that the application for permit was submitted to the Illinois EPA, Bureau of Air. As is often the case, the Illinois EPA engaged in conversations with the source regarding the application, particularly the dispersion modeling portion of the application, which formed the basis for the emissions limits embodied in the draft and final versions of the construction permit.**

3. When do the terms of the construction permit take effect?

**The terms of the permit take effect on December 18<sup>th</sup>.**

#### Permit Limits for Emissions of Ethylene Oxide

4. What forms the basis for the 110 pound annual limit on ethylene oxide emissions and the 60 pound annual limit on fugitive emissions?

**These limits on annual ethylene oxide emissions are based on dispersion modeling that was conducted by the source and audited by the Illinois EPA. The limits have been developed to assure maximum impacts below the USEPA action threshold for calculated lifetime cancer risk, 100 in a million. Both the limits and the dispersion modeling were required by the newly enacted law.**

5. Will there be testing to ensure compliance with these limits?

**Compliance with the emissions limits will be verified in large part through continuous emissions monitoring data and leak detection monitoring program data.**

6. If there was a leak of ethylene oxide, would it be counted against the annual emissions cap? Would it be considered against the fugitive emissions cap? A provision specifically stating that emissions from any leak, accidental or otherwise, counts towards the annual emissions cap should be included in the permit.

**Emissions of ethylene oxide from components and component leaks would count against both the total cap for the emissions of the facility and the cap for fugitive emissions.**

7. The permit should indicate at what point in the delivery process of ethylene oxide, Vantage assumes responsibility for the ethylene oxide. It should also clearly state that any emissions from leaks after that point count against the emission caps.

**Sources are generally responsible for activities that occur on their premises. As such, it is neither necessary nor appropriate for this permit to explicitly provide that Vantage is responsible for a particular aspect of this facility, e.g., the railcars for ethylene oxide.**

8. Is there a separate cap for the stack emissions of the facility? Are stack emissions limited to 50 pounds/year, which is the difference between the limit of 110 pounds/year and the limit of 60 pounds/year for fugitive emissions?

**There is not a separate limit for stack emissions of the facility. The annual cap on the ethylene oxide emissions of the facility is 110 pounds per year, of which no more than 60 pounds may be fugitive emissions.**

9. When does the emission cap take effect?

**The emission cap will first apply for calendar year 2020, the first full year after the permit is issued.**

10. Regarding fugitive emissions, I do not believe the cap would be enforceable because there are not enough stringent requirements for monitoring of components.

**This construction permit does not need to include extensive or detailed requirements for the leak detection monitoring and repair of components. This is because such requirements already exist in USEPA rules that apply to the components at the facility, 40 CFR 60 Subpart VVa, Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006. This permit only needs to include provisions that reflect the enhanced program that Vantage is implementing for components in ethylene oxide service compared to what would otherwise be required under 40 CFR 60 Subpart VVa. As such, the provisions in the permit only address certain aspects of leak detection monitoring and repair. For example, the permit sets more stringent criteria for being “in ethylene oxide service” and for a “leak.” The permit also prohibits reliance on certain provisions in 40 CFR 60 Subpart VVa that would reduce the frequency of required monitoring of certain components if certain criteria for the percentages of leaking components were met.**

11. While the enhanced leak detection monitoring program makes progress towards reducing fugitive emissions, it falls short of a guarantee that all possible sources of fugitive emissions from locations throughout the facility are being measured and that the 60-pound annual limit in the permit is enforceable.

**Environmental regulatory programs, including the construction permit program, do not guarantee against future noncompliance. Regulatory programs aimed at addressing air pollution generally establish standards that are technology-forcing, health-based or market-incentivized, depending upon statutory authorization. None of these approaches operate on the assumption that compliance is always assured. Rather, they are made enforceable against polluters, by governmental authorities and public alike and often at both a state and federal level, through the relevant laws or regulations and by way of applicable permit(s), with the aim of remedying and deterring noncompliance.**

**The concern that all possible fugitive emissions of ethylene oxide are being accounted for at the facility is an understandable one. But any regulatory approach for identifying and correcting fugitive emissions from leaking industrial components (e.g. valves, pumps and piping fittings) is necessarily challenging. Indeed, the Leak Detection and Repair programs developed by USEPA in its New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants likely represent the most effective way for controlling fugitive emissions from Vantage's equipment components. The construction permit builds upon USEPA's regulations with an enhanced leak detection monitoring program. Notably, the permit relies upon this monitoring program in requiring Vantage to determine emissions for measuring compliance with the annual emissions cap, which is an unprecedented feature for a leak detection monitoring program.<sup>1</sup>**

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<sup>1</sup> With respect to the scope of the permit's monitoring program, Condition 19(a) requires Vantage to maintain a list of components, identified by number (or some other comparable method), and that are distinct from components addressed by 40 CFR Part 60, Subpart VVa, that will be monitored. *Condition 19(a)(ii)*. The definition of "affected components" that addresses the types of equipment subject to the monitoring program consists of equipment that "emits or may emit fugitive emissions of ethylene oxide, including pumps, pressure relief devices, valves, sampling connections, flanges or other connectors, compressors (if any), and closed vent systems." *Condition 18*. Because the number of monitoring points is finite, Vantage should be capable of evaluating the various components on a consistent basis. More importantly, the construction permit incentivizes Vantage to be thorough and comprehensive in its monitoring for leaks, as its failure to detect a leak in its earliest stages will potentially amount to higher emissions being counted towards the construction permit's secondary cap for fugitive emissions. As such, Vantage's implementation of the leak detection monitoring program should be both verifiable and enforceable.

## Dispersion Modeling

12. What is dispersion modeling and what models were used in the modeling?

**Dispersion modeling is the mathematical simulation of how air pollutants disperse in the ambient atmosphere performed using computers with USEPA-approved models. These USEPA-approved models are designed to be conservative. The modeling relies on inputs such as stack height or release characteristics, emission rates and meteorological data, to predict ambient concentrations of pollutants from a source or sources.**

13. What ethylene oxide emissions does the dispersion modeling address?

**The dispersion modeling that supports this permitting action solely addressed the emissions impacts from Vantage. This is because the impacts of Vantage (and of the other permitted source of ethylene oxide emissions in Lake County) are localized and relatively small. The impacts of ethylene oxide emissions from Vantage greatly decrease with distance, with a calculated risk approximating 16 in a million 1 kilometer from the source.**

14. Has the USEPA or the Illinois EPA already tested the dispersion model that Vantage used in the modeling that it had conducted for the facility?

**The dispersion modeling used a standard USEPA-approved model, AERMOD. The modeling that Vantage had performed was submitted to the Illinois EPA for review and confirmation that it was performed properly.**

15. Did the modeling only address a certain area around the facility?

**The dispersion modeling addressed an area that extended out one kilometer from the facility. The modeling showed that maximum ambient impacts from the emissions from the facility occur close to the facility, well within a kilometer, so it was not necessary for the modeling to address a larger area**

16. Did the dispersion modelling consider the emissions of both Vantage and Medline? I live near to both facilities?

**The dispersion modeling only addressed the Vantage facility. However, the cap on emissions of ethylene oxide from the facility was set with consideration of background levels of ethylene oxide. Separately, dispersion modeling has been performed for Medline. The respective modeling for the facilities clearly indicates that impacts of the facilities are localized.**

17. Did the dispersion modelling take into account the half-life or decay of ethylene oxide in the atmosphere?

**The modeling did not account for any decay of emissions of ethylene oxide in the atmosphere.<sup>2</sup> As a general matter, atmospheric reactions are commonly only addressed in dispersion modeling for a pollutant like ozone where the concern is the formation of the pollutant in the atmosphere, not the reduction.<sup>3</sup>**

#### Reopening Provision

18. Why is a provision addressing the Illinois EPA's ability to reopen the construction permit after issuance not included within the construction permit issued to Medline, which is also located in Lake County?

**While irrelevant to the permit action at hand, a reopener provision was not included within the construction permit recently issued to Medline as it was not expressly provided for by law. As to Vantage, the provision was included based on an express statutory authorization for a reopening provision in the permit.**

19. What is meant by this reopening provision of the permit? What would it mean if the Illinois EPA reopens the permit in that regard?

**For certain air pollution control operating permits, the Act affords the Illinois EPA the opportunity to reopen issued permits under certain circumstances. Under the new law, the Illinois EPA shall "include permit conditions granting it authority to reopen the permit that imposes site-specific annual cap on ethylene emissions set to protect public health, if the Illinois EPA determines that the ethylene oxide emissions from Vantage pose a risk to public health as defined by the Illinois EPA.**

**The Illinois EPA explained at the public meeting that Condition 10 of the construction permit mirrors a requirement from the new law. If the Illinois EPA reopens the construction permit pursuant to this legal authority, it will most likely mean that new dispersion modeling information indicates that the annual emissions cap in the permit must be revised to assure that the cap remains protective.**

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<sup>2</sup> Ethylene oxide has a moderate half-life in the atmosphere, 50 to 100 days. The half-life varies because it is affected by the temperature and factors, such as the levels of moisture and ozone in the atmosphere.

<sup>3</sup> As ozone is a concern for ambient air quality, it is formed in the atmosphere from the reaction of precursor pollutants, primarily volatile organic material and nitrogen oxides. These are the pollutants that are actually emitted from sources and are the focus of control measures to reduce the levels of ozone in the ambient air.



## Historical Information

20. Was the stack test at the facility in May of this year conducted to get baseline data for use with data collected by the canister monitoring for concentrations of ethylene oxide in the areas around Vantage?

**This stack test was not conducted to obtain data that would be used with the data collected in off-site monitoring for ambient concentrations of ethylene oxide. This test was conducted for process equipment. The objective of this test was to measure emissions with the improved control system, with the dry bed absorber device after the scrubber, and to validate the effectiveness of the improved control system. Other stack tests have been conducted at the facility in the past.**

21. Before this application for permit, was the Illinois EPA aware of the historical emissions from Vantage?

**The Illinois EPA was aware of the emissions from Vantage prior to receipt of the application.**

22. Vantage has emitted more than 78,000 pound of ethylene oxide over the 10-year period of 2008 through 2017.

**Historical emissions are not directly relevant to the construction permit transaction at hand. Nonetheless, it is important to note that, consistent with common practice of sources of emissions, Vantage very conservatively calculated its emissions, and thus over reported its emissions. For general compliance purposes, this poses no issues. Indeed, a conservative method of calculation that overstates emissions is generally preferable to one that could potentially understate emissions. However, to more accurately reflect its actual emissions, Vantage has been working to more realistically calculate emissions. On this basis, the source submitted revised Toxic Release Inventory (TRI) reports to USEPA for the period 2011 through 2015. For the period calendar year 2008 through calendar year 2017, TRI information now suggests total emissions were less than half those claimed in this comment.**

23. There appears to have been a drop in reported emissions from Vantage. To what should this drop in emissions be attributed, a change in product mix or in capture or control technology?

**Indeed, the annual emissions of ethylene oxide of the facility as reported by Vantage have decreased. To the Illinois EPA's knowledge, there are several reasons for this. The first reason is the change in the manner of emissions calculations from a method that is more general to the chemical manufacturing industry and which tends to overstate emissions to one that is more specific to Vantage and which tends to better reflect actual**

**emissions. Another reason is the installation of an additional dry bed scrubber on the alkoxylation process.**

24. Did the Illinois EPA lose some information regarding Vantage?

**No, the Illinois EPA did not lose any “information” regarding Vantage. Likely this comment is referring to an inadvertent error by the Illinois EPA when submitting certain emissions data reported by Vantage to the USEPA. The Illinois EPA incorrectly entered a “zero” when submitting this data to USEPA when Vantage had not reported (nor was it required to report) data for emissions of ethylene oxide. This error was promptly addressed once identified.**

25. What happens if the Illinois EPA does lose some reported information?

**The Illinois EPA, Bureau of Air receives, logs, reviews and processes thousands of reports annually. Rarely if ever is this an issue. Indeed, the logging processes that are in place for receipt of reports mitigate against such losses.**

#### Public Access to Information

26. Will the public be informed of increases in ethylene oxide emissions at Vantage?

**Neither the stack nor fugitive emissions from Vantage are static, rather they vary. As such, it would be impractical and of questionable value to inform the public of every increase in emissions. However, emissions information relative to Vantage will be readily available from the Illinois EPA. Also, the Illinois EPA would inform the public of emissions that were of a magnitude that posed a substantial danger to public health or the environment.**

27. Timely access to information reported to the Illinois EPA by Vantage should be made available.

**The Freedom of Information Act is always a means for the public to access reports submitted to the Illinois EPA. However, the Illinois EPA will commit to posting on its web page certain reported information.**

28. How does the public gain access to reported information?

**As previously discussed, the public can generally obtain copies of documents that are not otherwise exempt from disclosure via the Freedom of Information Act. For ease, requests can be submitted electronically. The Illinois EPA endeavors to process such requests as quickly as possible. In this instance, the Illinois EPA will also endeavor to post certain relevant materials on its web page.**

29. Would information relative to compliance or enforcement activity involving Vantage be available online?

**During the pendency of such actions, information that is not otherwise exempt is available via the Freedom of Information Act process. However, at the closure of enforcement proceedings by the Illinois EPA, any compliance commitment agreements or settlement agreements are made publicly available in online databases on the Illinois EPA's webpage.**

30. When the Illinois EPA learns of elevated levels of ethylene oxide emissions, does it consider whether or what technologies could be improved at sources, whether companies have learned of changing technologies on its own, and does the Illinois EPA notify the public of these developments?

**The Illinois EPA has not addressed evolving changes in capture or control technologies in this permit because the new law does not provide for such considerations. In accordance with the new law, in this permit, the Illinois EPA has imposed a site-specific annual emissions cap on ethylene oxide emissions of the Vantage facility that is set to protect public health. If elevated levels of emissions occur, the Illinois EPA would necessarily investigate the measures that could be used at the facility to reduce emissions.**

#### Ambient Air Monitoring

31. Lake County monitoring data indicates threatening levels of ethylene oxide emissions from Vantage.

**Ambient monitoring is an indication of the amount of ethylene oxide in the ambient air. It does not directly identify the contributing source or sources of the ethylene oxide. As is well known, Vantage is not the only source of ethylene oxide emissions in Lake County. One of the undertakings of the federal government currently underway is an effort to establish background ambient levels of ethylene oxide in urban areas and to better understand the sources that contribute to these background concentrations. The ambient monitoring results in Lake County particularly near Vantage have been reflective of the emerging national data for background urban concentrations of ethylene oxide. As of the date of the public meeting, the results averaged to approximately 0.4 micrograms per cubic meter, which is consistent with the national average background concentrations.**

32. The Lake County air monitoring results were high, so why are the controls already in place not working?

**The ambient air monitoring results for Lake County that were available at the time of the public comment period were generally within range of the background that the USEPA has measured to this juncture. Further, the results are not solely and directly attributable to Vantage nor any other source. Rather, these results are a measurement of the ethylene**

oxide emissions in the ambient air from all contributing sources. Moreover, the results do not suggest that the control measures are not working. To the contrary, the data suggest that the emissions from the source fit within the developing national background level of ethylene oxide and thus that the control system and leak detection and repair program are working.

33. What is the significance of the “variance in testing?”

This comment relates to the ambient monitoring conducted by the Lake County Department of Public Health. As an initial matter, it must be noted that through the close of the public comment period for this permitting action, only a limited quantity of data had been collected over a limited window of time. That data, when averaged, was within current national ambient background ranges associated with ethylene oxide. Any variability with the data collected by Lake County in the vicinity of the Vantage plant necessarily relates to the individual daily samples. Variability would be expected in such daily samples given the variability in meteorological conditions. The results of individual daily samples should not be compared to risk levels. Rather, as both USEPA and ATSDR have indicated, for the ambient air monitoring results to be most instructive, a larger data set over a longer duration is most appropriate.

34. Will the Illinois EPA consider conducting ambient air monitoring on a regular basis?

Ambient monitoring merely addresses the quantity of a particular pollutant in the ambient air – in this instance, ethylene oxide. It does not directly identify the contributing source or sources of the ethylene oxide. As such, its utility in this instance is limited. The Illinois EPA is statutorily obligated to conduct ambient monitoring but for the express purposes of determining the background levels of ethylene oxide in the ambient air. No additional ambient monitoring for ethylene oxide emissions is contemplated at this time.

35. Only ambient air and perimeter monitoring can confirm that Vantage is not exceeding the permitted levels.

Ambient air monitoring is the systematic measurement of the level or concentration of a particular pollutant in the ambient air, i.e., “public” outdoor air or outdoor air in areas for which the public may have access, . Ambient air monitoring for ethylene oxide measures the level of ethylene oxide in the ambient air, but it does not directly identify the contributing source(s) of the ethylene oxide. Most ambient air monitoring is performed by states as part of their ambient air monitoring networks for pollutants for which there are national ambient air quality standards, e.g., ozone, particulate matter<sub>10</sub> and sulfur dioxide.

Perimeter monitoring can generally be characterized as air quality monitoring that takes place near the property boundaries of a source. It may or may not take place be conducted at a location to which the general public has access. It is occasionally

addressed for pollutants, such as particulate matter, when there is concern that the activities of a specific source may cause or threaten exceedances of a national ambient air quality standard for a pollutant.

The issued construction permit contains a total annual emissions cap for ethylene oxide, as well as monitoring, reporting and other requirements that provide an assurance of compliance by the source for its stack emissions. The permit also contains requirements for the monitoring of emissions from affected components (i.e., fugitive emissions) through an enhanced detection monitoring program. However, a permit is not appropriate for addressing off-site, ambient impacts. This is, in part, due to the nature of permitting, which imposes facility-specific requirements on a source that are reflected in a State Implementation Plan, which, in turn, are meant to assure that a State complies with the ambient standards set forth in the applicable National Ambient Air Quality Standards. Any legal obligation to monitor for ambient air concentrations, either fence-line or beyond the property boundaries of a source, is not addressed through permitting programs, but rather through either enforcement or a regulatory process for evaluating or developing ambient air quality standards.

Moreover, fence-line monitoring would not provide useful information to evaluate Vantage's implementation of its leak detection monitoring. The portable detecting instruments used for finding leaks from components would be impractical for measuring ambient air quality, as they are meant to probe for gases at a point of component interface. Similarly, off-site monitoring that is conducted with evacuated canisters that typically collect a sample of the ambient air for period of at least a day (24 hours) would not be practical, as they would not necessarily measure only concentrations of ethylene oxide resulting from the source's fugitive emissions but background concentrations of ethylene oxide in the ambient air.

36. While not explicitly spelled out in the new law (Public Act 101-0023), the Illinois EPA has the authority to order ambient and perimeter monitoring, as it would advance the goal of protecting public health from ethylene oxide exposure. The multiple references to "public health" in the new law demonstrate the legislature's intent for the Illinois EPA to act in this regard.

Neither the Environmental Protection Act (the Act) nor the new law authorize the Illinois EPA to require a source like Vantage to perform ambient or perimeter monitoring. In general, the Act does not authorize the Illinois EPA to impose an obligation for such monitoring, or its costs, on polluters. As the agency charged with the duty to collect environmental data, including "to operate and arrange for the operation of devices for the monitoring of environmental quality," the Illinois EPA possesses the authority to conduct and fund such monitoring on its own. See, 415 ILCS 4(b)(2018).

As noted by the comment, the new law does convey an intent that the Illinois EPA consider "public health" in its implementation of this law. However, a plain reading of

the law's text indicates that this design is intended only with respect to the development of the annual emissions cap. *See, 415 ILCS 5/9.16(e)(1)(PA 101-0023)*. It does not infer that public health considerations, in general, warrant the Illinois EPA's imposition of monitoring (or costs) on any emissions source regulated by the legislation. Moreover, the Illinois EPA's consideration of public health in this regard is effectuated by way of dispersion modeling, which is used in evaluating the cancer risks from human exposure to ethylene oxide consistent with guidelines developed by USEPA. Such consideration fulfills the legislature's intentions and is independent of the need or desirability of ambient or perimeter monitoring.

37. If individuals, as a group, or community, invest in our own ambient air monitors and find that the levels of ethylene oxide emissions are too elevated, are they able to sue?

As explained at the public meeting, the Environmental Protection Act (the Act) provides for civil enforcement remedies against polluters before a circuit court or the Pollution Control Board. *See, 415 ILCS 5/42(a) and 5/31(d)(1)(2018)*. These remedies can include the assessment of civil penalties (amount not to exceed \$50,000 per violation and \$10,000 per day for any continuing violation) and injunctive relief. *See, 415 ILCS 5/42(h) and 5/33(b)(2018); 415 ILCS 5/45(b)(2018)*. These remedies are separate from administrative civil penalties that the Illinois EPA is authorized to recover for limited and relatively minor types of violations through an administrative citation process. *See, 415 ILCS 5/33.1(2018)*.

Two additional considerations for bringing a lawsuit under the afore-mentioned legal authorities are worth noting. One relates to the factual information used to support the lawsuit, which was only briefly discussed at the public meeting.<sup>4</sup> The other consideration is to clearly identify in the complaint the applicable emissions limitation or standard that forms the basis of the lawsuit. In the case of Vantage's emissions of ethylene oxide, the issued construction permit would provide a possible basis for a future permitting violation under the Act, including a violation of the annual emission cap. Another legal standard under the Act that could be alleged is the general prohibition against causing, allowing or

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<sup>4</sup> More specifically, physical or documentary evidence supporting a violation of the Environmental Protection Act's requirements will need to be developed, assembled and admitted into evidence in the enforcement proceeding. Documentary evidence, such as calculations based on emission factors or other considerations that relate to the field of air pollution control, showing that an emissions limitation or standard is (or was) exceeded will generally represent adequate proof of a violation, unless actual emissions are shown to be in compliance. *See, 35 Ill. Adm. Code 201.122*. Other types of evidence, such as digitally-recorded or electronic data, may raise a host of questions regarding the calibration and performance capabilities of the relevant monitoring equipment, as well as the correlation of recorded results to a time increment consistent with the applicable emissions limitation or standard. An expert witness will likely be needed to provide an opinion as to any technical or specialized knowledge pertaining to the evidence, and expert testimony relating to the reliability of any given scientific principle, test or methodology must meet the requisite legal standard for admissibility.

threatening air pollution.<sup>5</sup> However, there are evidentiary challenges to be overcome in such an action. For one thing, the risk-based values used by USEPA in estimating chronic exposure to ethylene oxide, which are not legal standards in and of themselves, are distinct from the more straight-forward legal standards that are the subject of conventional air pollution enforcement cases brought under Section 9(a) of the Act.

#### Stack Emissions

38. How would stack emissions of the facility be monitored?

The permit requires continuous emissions monitoring for the stack emissions of the facility. The source of these emissions is the reactors or “process equipment” at the facility. They share a common emissions control system, a wet scrubber that is now followed by a dry bed absorber. The continuous emissions monitoring system would measure the emissions after the control system. This emissions monitoring system is currently being installed. During any upset or outage of the emissions monitoring system, the permit would rely on representative values for emissions that reflect the operation of the process equipment and the emission control system.

39. What is “continuous emissions monitoring?”

Continuous emissions monitoring is a tool used for, among other purposes, measuring concentrations of pollutants in the emissions coming out of a stack. The continuous emissions monitoring system that is required of Vantage is in addition to other compliance assurance measures. When Vantage is operating, the continuous emissions monitoring system will be the standard means to measure its emissions of ethylene oxide. This goes beyond the historical approach to determining emissions by way of periodic emissions testing, operational monitoring and records, and emissions calculations.

40. Why is there still a wait for this monitoring system?

At the present time, the key piece of the continuous emissions monitoring system, the analyzer for ethylene oxide, is not a “ready-made” item that can potentially be purchased from several different suppliers out of their inventory. This analyzer has been made and assembled “to order” by the supplier specifically for use at the facility. This analyzer and the other pieces of continuous emissions monitoring system are currently being installed at the facility.

41. For each day, would the continuous emissions monitoring system provide data for emissions of ethylene oxide for each minute or hour during the day or only just for the total emissions for the day?

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<sup>5</sup> This was the statutory basis for the civil enforcement action brought against Sterigenics under Section 9(a) of the Act by the State of Illinois and DuPage County State Attorneys’ Office.

**The construction permit requires hour-by-hour emission data for process equipment, as would be normally be measured by the continuous emissions monitoring system. This monitoring system would actually measure emissions at least every minute and this data would be combined to provide the data that is recorded for hourly emissions.**

42. What is the detection limit of the continuous emissions monitoring system?

**For the emissions monitoring system, the required detection limit or “limit of quantification” as set forth in the construction permit is 20 parts per billion (ppb).**

43. If the limit of detection for the continuous emissions monitoring system for emissions from process equipment is 20 ppb and this system can only measure concentrations of 20 ppb or higher, could emissions during periods when the concentration is below the 20 ppb limit of detection be large when considered on an annual basis? Could they be enough to be the difference between meeting and not meeting the annual cap for the emissions of the facility?

**The assumption underlying this question is that “zero” is recorded when the concentration of the emissions is below the limit of detection or “limit of quantification”<sup>6</sup> of the monitoring system but emissions are still actually occurring. However, when the concentration is below the limit of quantification of the monitoring system, the concentration is recorded as the limit of quantification, not as zero. Accordingly, the system conservatively accounts for emissions during periods when the concentration of emissions is below its limit of quantification.**

44. The continuous emissions monitoring device will generally meet the requirements in USEPA’s Performance Specification 15 (PS-15), “Performance Specifications for Extractive Fourier Transform Infrared Spectroscopy (FTIR) Continuous Emissions Monitor Systems in Stationary Sources.” However, the draft permit would require a limit of quantification of 20 ppb, which is a very low concentration. As a result, two of the current requirements of PS-15 would not be appropriate for this monitoring device. The requirement for the accuracy of calibration gases should be  $\pm 5$  percent rather than  $\pm 2$  percent. The requirement for spike recovery, which is an element of the procedures for quality assurance, should be  $\pm 30$  percent rather than  $\pm 5$  percent. These alternatives to the requirements in PS-15 are necessary because the limit of quantification that is being required of the monitoring device would not be achievable if the established requirements of PS-15 were retained.

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<sup>6</sup> The limit of quantification is the lowest concentration at which a substance can not only be reliably detected but at which some predefined standards for the accuracy of measurement are met. A limit of quantification may be equivalent to a limit of detection or it could be a higher concentration.



**This issued permit includes alternatives to certain provisions of PS-15 as recommended in this comment. This comment, which was made by the supplier of the monitoring device, Max Analytical Technologies, adequately explains and justifies the need for these alternatives.**

45. How would one know how much Vantage has emitted during outages of the continuous emissions monitoring system?

**As general matter, air pollution control rules recognize that there will be outages of continuous emissions monitoring systems. When monitoring systems are used to quantify the amount of emissions over a period of time, rather than to determine compliance with an emission standard, rules address how emissions during such outage of the monitoring system are to be addressed. The approach taken in this permit is to require a collection of representative values of emissions to be established and maintained from the emissions monitoring that is conducted. This collection would include representative values for hourly emissions for different operational configuration of the process equipment and operating conditions of the emissions control system. As such, there will be hour-by-hour emission data for process equipment even during outages of the continuous emissions monitoring system.<sup>7</sup>**

46. As the permit would provide that when the emissions monitoring system is down, emissions may be determined with representative values of emissions. For how long would use of representative data be allowed before it would be a deviation and must be reported?

**The permit does not provide a set duration beyond which the outage of the emissions monitoring system would be considered a deviation because outages of the monitoring equipment can and do occur for a variety of reasons. Moreover, the operation of emissions monitoring systems is generally more effectively addressed by looking at the operation of the system over a period of time rather than looking at individual outages. This provides more insight into the frequency and magnitude of outages of the monitoring system, the causes of outages, whether outages could reasonably have been avoided, and whether a source takes reasonable and appropriate actions in response to outages. Accordingly, the permit provides for reporting of information about the operation of the monitoring system in the quarterly report. This will provide information that will be more useful for evaluation of the operation of the monitoring system than would occur if outages were addressed individually.**

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<sup>7</sup> If the continuous emissions monitoring system that is currently being installed for stack emissions from process equipment is not certified by January 1, 2020, this approach will have to be used to address emissions during the period until the monitoring system is fully operational. In that case, emission data that is measured by the emissions monitoring after it is fully operational will be used to develop representative values for hourly emissions under different modes of operation. These values will then be used to go back to reconstruct hour-by-hour emissions for the period before the monitoring system was fully operational.

47. When does the continuous emissions monitoring system need to be installed?

**The new law did not set a date by when the continuous emissions monitoring system must be installed. However, information available to the Illinois EPA indicates that Vantage ordered and has received the continuous emissions monitor. Further, available information suggests that the monitor will be operational by December 18, 2019.**

#### Fugitive Emissions and Components

48. The cap for fugitive emissions will not be easy to implement because Vantage would not be required to construct permanent total enclosure with negative pressure to capture fugitive emissions.

**Implementation of a cap for the fugitive emissions of the facility does not require construction of permanent total enclosure. The various pumps, valves, fittings, piping connectors and other components at the facility that are the source of fugitive emissions are designed and maintained to contain materials and keep them from being lost to the atmosphere. The fugitive emissions that occur from leaks at these components are able to be quantified from the data collected during periodic leak detection monitoring that is already conducted for these components and would now be required by the permit. The required approach to quantification of emissions for purposes of the emission cap builds upon leak detection monitoring that is already required at the facility to identify leaking components and to then facilitate timely repair of those components. In this regard, leak detection and repair programs are the established approach for addressing fugitive emissions from components at chemical manufacturing plants like this facility. This approach to quantification of emissions has already begun to be implemented at the facility for the collection of emission data for annual reporting of emissions and will now also be used to collect emission data for purposes of the new cap on annual emissions.**

**By way of comparison, permanent total enclosure would not be a practical approach to addressing the fugitive emissions of the facility. It would necessitate the design and construction of an appropriate building or buildings around the existing components at the facility and/or extensive reconstruction of the existing buildings. These new or reconstructed buildings would be intended to collect emissions from components that are already designed and maintained to contain process materials and keep them from being emitted. Emissions monitoring would still be needed for the exhaust ventilation exhaust from the buildings. These circumstances of this facility for fugitive emissions are different than those of a manufacturing operation in which some of organic material is directly emitted from the operation and these emissions must first be captured if they are to be controlled.**

49. Why would the permit not require installation of a permanent total enclosure to ensure accurate and verifiable emissions data?

**As discussed, permanent total enclosure is not necessary to have accurate and verifiable data for fugitive emissions of the facility. In addition, the purpose of this permit is to set a cap on the facility's emissions of ethylene oxide as required by the new law. Beyond the changes that it has already taken for the emission control measures at the facility, Vantage has not proposed any further changes to comply with the emission cap other than the ongoing implementation of an enhanced leak detection and repair program.**

50. Permanent total enclosure would be the most accurate way to ensure compliance with the annual emissions cap to "protect the public health" as required by the new law. The new law requires an annual cap on emissions that protects the public health.

**As discussed, a cap on the fugitive emissions of the facility can be implemented using data that is collected during leak detection monitoring for components at the facility. As discussed, permanent total enclosure is not a practical approach to the fugitive emissions of this facility from these components.**

51. For fugitive emissions, the draft permit would not require constant monitoring of subject components." A quarterly "monitoring campaign" and subsequent "calculation" of emissions based on a snapshot of ethylene oxide concentration near a subject component is not sufficient to ensure compliance with an annual cap on emissions. Why would the permit not require that an emissions monitoring device be installed by each subject component to continually measure the amount of ethylene oxide near the component?

**The alternative approach to monitoring of components implicitly suggested by this comment would not provide meaningful data for the fugitive emissions from components. It overlooks an essential aspect of emissions monitoring when monitoring is being conducted to determine the mass of emissions. This is the determination of the volume or flow rate of flue gas or air that is associated with such emissions.<sup>8</sup> In the absence of data for gas volume or flow rate, the mass of emissions cannot be determined. As already discussed, the installation of permanent total enclosure, which would be a prerequisite to monitoring of gas flow rate, is not feasible.**

**Moreover, this comment reflects a number of misunderstandings about leak detection monitoring of components including how the data from leak detection monitoring is converted into emission data, and the enhanced leak detection monitoring that Vantage is implementing (as now made enforceable by the issued permit). In leak detection monitoring, the monitoring instrument is not held near subject components to measure**

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<sup>8</sup> When stack monitoring is conducted to determine the mass of emissions, monitoring may also be conducted for the stack for the volume or flow rate of air or flue gas of the in which those emissions occur. The mass of emissions is then calculated as the product of the concentration of the pollutant in the flue gas, as measured by the pollutant monitoring device, and the volume of flue gas, as measured by the monitoring device for gas flow rate.

emissions in the air. Rather, measurements are made with a probe placed on the surface of the component at the interface where leakage could occur or, for rotating shafts within one centimeter of the shaft-seal interface. The probe is moved along or around the interface of a component where a leak could occur.<sup>9</sup> This is required because the basic purpose of leak detection monitoring is to identify leaks from components, not to quantify emissions. In the enhanced monitoring program for the facility that Vantage must implement, monitoring of subject components is to be conducted on a monthly basis, not on a quarterly basis. Lastly, emissions from components are calculated from the data measured by the leak detection monitoring using correlation equations developed by USEPA for different types of components, e.g., connectors and flanges. These emission calculations address the emissions from components for the period from the previous leak detection monitoring to the current leak detection monitoring. Accordingly, the leak detection monitoring that is conducted for the facility data for emissions will provide ongoing data for emissions from components.

52. Why does the draft permit not specify that leak-free pumps be used at the facility for the pumps that handle ethylene oxide? Leak-free technology for certain types of components is not new.

The function of this permit is to set a cap on the emissions of the facility, as required by a new law. This law does not require Vantage to replace existing components at the facility. In addition, the use of “leakless” components may not be feasible considering materials of construction, the processes to which they would be applied, the operating conditions of the processes, the consequences for maintenance activities and safety requirements. Moreover, the conversion of the facility to leakless components would not have been possible in the time frame set by the new law. Finally, it is unclear that an enhanced leak detection monitoring program, with a 50 ppm threshold for a leak, will not provide comparable results to use of leakless component technology. At the same time, this permit does not prohibit installation of new components to replace existing components, including new leakless components at the facility as Vantage determines it is feasible and desirable to do so to ensure compliance with the emission cap for fugitive emissions.

53. The draft permit does not address monitoring of the ethylene oxide storage tank at the facility. Why is monitoring not required for this storage tank and its emissions required to be counted against the emissions cap?

The draft permit does not address the storage tank for ethylene oxide at the facility because this tank is a pressure tank. Pressure tanks are designed to operate without emissions to the atmosphere. They are necessarily used to store gases and liquefied gases, such as liquefied petroleum gases (LPG) and butane. As such, emissions of ethylene

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<sup>9</sup> The USEPA’s procedures for leak detection monitoring are in USEPA Reference Method 21, Determination of Volatile Organic Compound Leaks. (For CFR 60, Appendix A, Method 21.) The procedures for monitoring of individual components are in Section 8.3 of Method 21.

**oxide would not occur directly from this tank but from leaks from the components associated with the tank. The permit addresses emissions from these components.**

54. The draft permit would not appear to require that every subject component be monitored in a minimum time once coming into service. The permit would provide for monitoring of components that are in service at the time of a monitoring campaign. What if components are placed in service after a campaign and subsequently removed from service before the next campaign? Under the draft permit, those components would not be required to be monitored, so their emissions would not be counted against the emissions caps. The permit should require that new subject components must be monitored before being removed from service.

**It is not appropriate for the permit to require leak detection monitoring to be conducted in the scenario described in this comment, in which leak detection monitoring would not otherwise be conducted for a component. Such a requirement would essentially dictate that such a component be kept in place and continue to be operated for the purpose of being monitored.<sup>10</sup> This would potentially delay the removal of a component in circumstances in which Vantage determined that it would be appropriate to remove it. In addition, given the required frequency of leak detection monitoring campaigns, this scenario would be uncommon. However, to address scenarios in which monitoring would not be conducted for component(s), the issued permit requires Vantage to address such components when determining emissions from components. Engineering estimates would be required to be made for the emissions of such components because measurements from leak detection monitoring would be available for such component. This requirement will also serve to address the emissions from transitory leaks, which are directly identified by visual observation, e.g., the presence of droplets or frost on a component, rather than by monitoring.**

55. At the public meeting, the Illinois EPA stated that the monitoring campaigns are conducted by a third-party contractor. However, this would not be required by the draft permit. The permit should require that leak detection monitoring of components be conducted by an independent party, other than Vantage, to prevent changes in the future. Without such a requirement, Vantage could be essentially “self-policing.”

**While Vantage’s current practice is to have leak detection monitoring performed by a contractor (currently Montrose Environmental Services), it is not appropriate for this to be required by the permit. It is now common practice for sources that are required to conduct leak detection monitoring to use the services of a contractor to perform such monitoring. This enables such monitoring to be efficiently conducted by groups of**

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<sup>10</sup> In rules that address leak detection monitoring for components, the term “in service” is used with the classes of materials that components may handle, e.g., “in gas/light liquid service” or “in VOC service.” This term is not used with a more common meaning, such as to describe the installation of a piece of equipment as putting that equipment “in service.”

individuals who specialize in such monitoring. Each subject source does not need to maintain the staffing and other resources to periodically perform required monitoring. Instead, a contractor is responsible for providing the staffing, training, supervision, equipment and other resources to conduct the monitoring that is required of a number of client-sources. The advantages to Vantage from contracting out leak detection monitoring will continue to be a significant. On the other hand, the nature of leak detection monitoring is not such that Vantage could not develop and maintain the capability to conduct leak detection monitoring in-house. The conduct of leak detection monitoring may also be directly verified by visual observation. In summary, even if the Illinois EPA had the authority to impose a requirement that leak detection monitoring be conducted by a contractor, rather than by Vantage, the circumstance would not warrant such a requirement.

However, as this comment addresses the entity that conducts leak detection monitoring at the facility, it has resulted in an additional requirement in the issued permit. The issued permit requires Vantage to notify the Illinois EPA if a different contractor will be conducting the required monitoring or if it will be conducting the required monitoring itself. This will facilitate action by the Illinois EPA to observe and review that monitoring conducted by the new party. The permit would require Vantage to provide this notification to the Illinois EPA in advance of monitoring by a new party.

56. Condition 19(a)(i) would address the meaning of “in ethylene oxide service.” It would provide that this term “... shall be defined to include any piece of equipment that contains or contacts a process fluid that is at least 1.0 percent ethylene oxide by weight.” What is the reason for the 1.0 percent number? The permit should require that any process fluid containing ethylene oxide, regardless of the percentage by weight, be subject to the monitoring requirements.

A numerical criterion for being “in ethylene oxide service” is essential to clearly define the scope of the enhanced leak detection monitoring program that is implemented for the facility. The criterion for this term in Condition 19(a)(i) was developed from the definition of “In VOC service” in 40 CFR 60.481a in the federal New Source Performance Standard for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006, 40 CFR 60 Subpart VVa. This rule provides that “ ‘In VOC service’ means that the piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight.” A more stringent criterion than the one in 40 CFR 60 Subpart VVa for “in VOC service” is appropriate for the enhanced leak detection monitoring program implemented by Vantage. The selected criterion for “in ethylene oxide service” is one tenth of the numerical value in 40 CFR 60 Subpart VVa. This lower value will be effective in setting out the required scope of the monitoring program and addressing emissions of ethylene oxide from components. It is not appropriate to expect that components containing fluids with lower concentrations of ethylene oxide, in the unlikely event there are any such

**components at the facility, would meaningfully affect the determination of fugitive emissions.**

57. Condition 19(a)(ii) of the draft permit states “Under the enhanced program, monitoring of components required to be conducted on a quarterly basis under 40 CFR 60 Subpart VVa shall be conducted on at least a monthly basis for components in ethylene oxide service, with such monitoring separated by at least 15 days.” How was this interval selected?

**This requirement was developed from 40 CFR 60 Subpart VVa. The interval between required periodic leak detection monitoring is addressed in 40 CFR 60.482-1a(f)(3), which generally provides that monitoring may be conducted at a reasonable interval after completion of the last monitoring campaign. This rule does not address monthly monitoring. However, it does provide that when monitoring is required to be conducted semiannually (i.e., once every 2 quarters), monitoring must be separated by at least 60 calendar days. When quarterly monitoring is required, monitoring must be separated by at least 30 calendar days. For monthly monitoring, the provisions of 40 CFR 60.482-1a(f)(3) suggest that an interval of 10 days could be acceptable (one third of the 30 days required for quarterly monitoring). However, to assure a more even spacing of required monitoring campaigns, a 15-day interval is specified. This should still provide for this monitoring to be conducted by contractors, which must schedule the monitoring that they conduct to provide service for a number of client sources.**

58. Condition 19(a)(vi) of the draft permit would set requirements for the instruments used to conduct leak detection monitoring for components. The permit should require use of instruments that automatically record the measured concentrations of ethylene oxide, thus preventing tampering, misrepresentation or mistakes in record the data.

**For leak detection monitoring campaigns, the use of monitoring instruments that automatically record the measured concentrations of ethylene oxide is now standard practice. In addition, tags with barcodes are applied or attached to the individual components and barcode readers are used to enter the identity of each component that is monitored. These practices reduce the effort and time entailed in leak detection monitoring. However, it is not appropriate for these practices to be required by the permit. Such a requirement would potentially interfere with timely leak detection monitoring in circumstances in which it cannot be conducted with automated recording of data. This could occur for the monitoring of specific components after preventative or corrective work on the components. It would also occur when monitoring must be conducted during outage or breakdown of the automated recorders.**

59. The permit should require that if Vantage completes any monitoring of subject components outside of a monitoring campaign, that data should be provided to the Illinois EPA for review.

**This reporting to the Illinois EPA of certain data collected during leak detection monitoring, as recommended by this comment, is not warranted. In this regard, the permit generally requires that Vantage keep records of the data that is collected during leak detection monitoring. This requirement applies for all leak detection monitoring data that is collected, including both data collected during the regular campaigns and data that is collected during other leak detection monitoring. Given the amount of information that will be contained in these records, the permit does not require Vantage to provide a copy of these records to the Illinois EPA. Rather, these records must be kept at the facility and be readily accessible to Illinois EPA staff. Upon request by the Illinois EPA, copies of these records as specified in a request, must be formally provided to the Illinois EPA.**

**This is an appropriate approach to recordkeeping for the “primary data” that is actually collected during leak detection monitoring conducted at the Vantage facility. In this regard, as well as being collected during regular monitoring campaigns, this data will also be collected in the routine, component-specific monitoring. This component-specific monitoring must accompany preventative or corrective work performed by Vantage on specific components. This work takes place between the regular monitoring campaigns. Rather than requiring reporting to the Illinois EPA of the primary data that is collected during leak detection monitoring at the facility, the permit requires reporting of information that is more appropriate for reporting to the Illinois EPA. This involves reporting information to confirm this implementation of the enhanced leak detection monitoring program that is relied upon and required by the permit. It also involves the results of the monitoring program, i.e., the emissions of ethylene oxide that have occurred as measured by the monitoring program.**

60. In leak detection monitoring, a technician goes to each component, such as a valve or a pipe connector, with a hand-held monitoring instrument and measures the concentration of ethylene oxide at the surface of the component where a leak could occur. Is the measurement manually recorded or does the instrument automatically record the measurement for each component when the technician hits “record,” so that the data cannot be incorrectly entered or changed later.

**Monitoring instruments that electronically record the measurement for each component are now commonly used in leak detection monitoring, especially in the periodic campaigns in which monitoring is conducted for a number of components. When leak detection monitoring is conducted for a few components, as would occur after maintenance or repair, a monitoring instrument that does not have automatic monitoring capability may be used. It should be remembered that the measurements made by these instruments are not the actual emissions from the components. A computer and equations developed by USEPA for various type of components are used to calculate the emissions from each component from the time it was last monitored, considering both the current and the previous measurements. Accordingly, automated data collection avoids the need to manually enter data into the computer program for the emission calculations.**



61. Since Vantage produces different chemicals, I expect the processes changes on a somewhat regular basis. However, the draft permit would provide that every component in service at the time of the periodic monitoring campaign needs to be monitored. My concern is that Vantage could operate in such way that leak detection monitoring is never conducted for certain components. For example, ethylene oxide is only used in the first three weeks of each month but monitoring campaigns are always conducted during the last week of each month. To address this, the permit should require that every single component must be monitored.

**This concern expressed by this comment has limited relevance for the facility. Ethylene oxide is used at the facility in the Alkoxylation Area. While reactors in this area make products that do not use ethylene oxide, the dedicated supply system for ethylene oxide to the reactors continues to be in ethylene oxide service to be able to supply reactors that are using or could be switched back to ethylene oxide.**

**As related to components on the actual reactor vessels, this concern is addressed in 40 CFR 60 Subpart VVa. For process units that operate for less than 75 percent of the year (274 days), the frequency of required monitoring is appropriately reduced by 40 CFR 60.482-1a(f)(1). For example, if a process unit only operates between 183 and 274 days per year, leak detection monitoring may be conducted bimonthly rather than monthly. This reflects the lower potential for emissions from leaks from such unit. It also facilitates scheduling of leak detection monitoring by the source so that it occurs when such unit would be in operation. The rule does not simply require that leak detection monitoring be conducted for such unit as if it were routinely in operation and available for leak detection monitoring to be conducted.<sup>11</sup>**

62. For new components installed at the facility, the permit should require that leak detection monitoring be conducted within a certain time frame after installation rather than simply requiring monitoring as part of the next periodic monitoring campaign.

**The permit appropriately addresses the timing of the monitoring of any new components installed at the facility because the periodic monitoring campaigns must be conducted on a monthly basis.**

63. In the enhanced leak monitoring program for components, when a leak is detected, how soon must the leak be repaired, or the leaky component replaced? Is there a time limit in the permit?

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<sup>11</sup> As a consequence of this comment, the issued permit provide that the frequency of leak detection monitoring may be less frequently than monthly, as provided for by 40 CFR 60.482-1a(f)(1), for a process unit that operates for less than 274 days in a year.

The required timing for repair of leaks by Vantage under the enhanced leak monitoring program would continue to be subject to the relevant provisions in the USEPA's rules at 40 CFR 60 Subpart VVa. In general, these rules require repairs to be made as soon as practicable, with a first attempt at repair within five calendar days and a repair accomplished in 15 days. In addition, there are addresses certain circumstances, as addressed in 40 CFR 60.482a, in which repair of a leak may occur after 15 days. For example, if the component is isolated and does not remain in VOC service or if the repair is not technically feasible without shutdown of the process unit, repairs may be completed in more than 15 days. Given the obvious thought and care exercised by USEPA in the development of the provisions of 40 CFR 60 Subpart VVa that address the required timing for the repair of leaks, this not a matter that needs to be addressed in the permit.

64. When conducting leak detection monitoring, are the measured concentrations taken "as is" or are the measured concentrations adjusted if there is a background level of the pollutant in the area in which the component is located?

The measurements made during leak detection monitoring may be adjusted to subtract a "background concentration." The basic objective of leak detection monitoring is to identify components that are leaking so that they can be repaired. This objective would not be fulfilled as effectively if the results of leak detection monitoring were "inflated" by the background concentration of a pollutant in an area. That is, in addition to triggering repair for leaking components, the monitoring could also trigger repairs for other components that only appear to be leaking because of the emissions of the components that are actually leaking.

65. The permit should require monthly reporting of the results of the leak detection and repair program.

The days on which monthly monitoring is conducted for components and the number of days between the monthly monitoring campaigns will not be the same from month to month. As such, data that would be reported on a "monthly" basis would not be representative of emissions during each calendar month. Data that is reported on a quarterly basis, as it addresses a longer period, will not be as affected by the timing of monthly monitoring. As such, quarterly reporting of data will be more useful than monthly reporting.

66. Leak detection monitoring for components is being conducted on a monthly basis. There is no reason to delay reporting of data that will already have been gathered and should therefore be reported on a monthly basis.

The permit provides that the enhanced leak detection monitoring be implemented on at least a monthly basis, the first phase of which focuses on the physical process of monitoring equipment associated with components that are in ethylene oxide service. *Condition 19(a)*. Given the anticipated number of equipment components, this

investigative phase of the monitoring may take several days to perform. This process also needs to be separated by at least 15 days from the monitoring conducted during another campaign, which provides some assurance that operating conditions are representative from one campaign to the next. *Condition 19(a)(iii)*. In addition, the enhanced leak detection monitoring is in addition to the quarterly reporting that must be performed by the source under 40 CFR Part 60, Subpart VVa, as well as the non-periodic monitoring that would be associated with equipment repairs and preventative maintenance. For these reasons, the selection of a monthly time period for completing the program monitoring is not unreasonable

67. Immediate notice to both the Illinois EPA and the public of leaks should be required.

**Immediate notification to the Illinois EPA for leaks at the facility that are detected through the leak detection monitoring is neither practical nor desirable. Implementation of the enhanced leak detection monitoring program under the terms of the construction permit is designed to monitor identified components that are ‘in ethylene oxide service’ on a monthly basis, with a subsequent process for determining total emissions of ethylene oxide emissions obtained from the monitoring campaign being completed no later than 30 days afterwards. Given the time-frame needed to perform the monitoring, develop the emissions information and complete any non-periodic monitoring conducted in between the monitoring campaigns, the permit’s reporting requirements are not unreasonable. Information submitted to the Illinois EPA will necessarily be available to the public under the Freedom of Information Act.**

**However, consistent with its commitments regarding other information addressed in this Responsiveness Summary, the Illinois EPA is committed to making quarterly reports required by the permit available on its web page.**

68. While the draft permit would address fugitive emissions from components and component leaks, it would not address fugitive emissions from accidental releases. Would accidental releases be counted against the annual cap of 110 pounds/year? In 2018, the emissions from an accidental release at a plant in Delaware that manufactures ethylene oxide were almost 3,000 pounds. Accidents occur at chemical plants that cause releases of emissions. Are emissions from accidents regulated under permits or they treated independently? This permit should include something to address emergency releases. Local residents would like to see emergencies addressed because they could actually happen.

**The permit addresses the routine operation of the facility as would be expected to occur from year-to-year. The permit does not address the releases that would accompany emergencies or chemical accidents at the facility. Emergency releases are addressed by laws that are generally beyond the scope of the air pollution control permits issued by the Illinois EPA, including the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the federal Emergency Planning and**

**Community Right-to-Know Act (EPCRA). Under these laws, sources in Illinois must provide notifications for emergency releases in Illinois that equal or exceed the established reportable quantity for particular chemical(s) to the National Response Center, the Illinois Emergency Management Agency, and the local emergency planning commission.<sup>12</sup> If emergency releases involve emissions or other discharges to the environment, the Illinois Emergency Management Agency works with the Illinois EPA's Office of Emergency Response on the immediate response to the incidents. Following incidents, enforcement may be initiated depending on the nature and circumstances of the incidents and the resolution of this enforcement may lead to monetary and other legal penalties.**

**As these programs and procedures already exist independently of this permit, it is not necessary or appropriate for them to be addressed in the permit. However, there exists the possibility that emergency releases could occur at the facility that are less than the current reportable quantity for ethylene oxide, 10 pounds. To address this possibility, the issued permit includes a requirement that Vantage directly notify the Illinois EPA, Bureau of Air, of emergency releases that are below the applicable reportable quantity under the established programs that otherwise address emergency releases. Any such notification for an emergency release would be required to be provided as soon as possible by telephone, recognizing that actions to respond to the release may preclude immediate notification. The telephone notification would be required to be followed by a written notification or report for the incident.**

#### Process for the Application and Permit

69. After Vantage submitted the application to the Illinois EPA for this permit, did the Illinois EPA have any questions for Vantage or was the application just accepted as is?

**The Illinois EPA had a number of concerns about the air quality dispersion modeling that was initially conducted. For example, the Illinois EPA was concerned that the modeling did not include an adequate number of receptors close to the location at which the highest concentration was indicated to confirm that the maximum concentration occurred had been identified. Vantage went through several iterations with the dispersion modeling until the Illinois EPA was satisfied that appropriate modeling had been performed.**

70. Did Vantage sign off on the draft construction permit?

**A preliminary draft of the permit was provided to Vantage before a draft permit was released for review and comment by the public. Vantage expressed concerns that it would be a tight permit, but, beyond that, Vantage understood that this permit would set additional requirements that it will have to begin complying with.**

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<sup>12</sup> The local emergency planning commission for sources in Lake County is Lake County's Emergency Management Agency.

71. What are the meeting notifications requirements for public meetings such as those held for the recent permit transactions involving Vantage and other sources in Lake County?

**The time frame for these notifications largely relates to the type of permitting transaction. For certain permitting transactions, like this one, public notice is not required but the Illinois EPA may still conduct public outreach, using historical practice as guide.**

#### Compliance

72. How is compliance with the permit ensured without ambient monitoring?

**As already discussed, the permit contains terms for verifying emissions compared to the newly established emissions limits. Most notably, continuous emissions monitoring and leak detection program monitoring data are required. These site-specific terms are appropriate to verifying compliance. The notion that ambient monitoring would serve such purpose in this instance is misplaced. Further, there is not express authority for ambient monitoring.**

73. The permit provides insufficient measurement of fugitive emissions.

**The fugitive sources of emissions at Vantage are subject to a leak detection monitoring program, which requires periodic measurements from which fugitive emissions may be determined. Notably, Vantage does not simply implement the regulatorily required leak detection and repair program, but implements an enhanced program with more frequent measurements, with a lower detection level for action. This enhanced program is embodied in the permit and is the means for ensuring compliance with the annual fugitive emissions value also set forth in the construction permit.**

74. The Illinois EPA should require regular and accurate measurements of monitored emissions from Vantage (or the third-party contractor providing service to Vantage), which should be verified or audited by the Illinois EPA.

**In general, the Illinois EPA does not compel or require a permittee to employ an independent contractor to perform the various responsibilities, including monitoring of control systems, set forth in a permit. This is because some emission sources can possess in-house expertise and/or resources to capably perform the tasks, whereas other sources may desire or need to hire outside consultants to accomplish the same. A permit condition requiring that the source employ an independent contractor for some routine task would need to meet the relevant legal standard for permit conditions (i.e., it is necessary to accomplish the purposes of the Environmental Protection Act). Absent some technical basis calling into question the source's capabilities, a permit requirement for an independent contractor would not be necessary, and would not meet the legal standard,**

if the source is capable of accurately performing the same task on its own.<sup>13</sup> A belief that a source is not trustworthy simply because of self-interest is not an adequate reason for authorizing such a condition.

In addition, self-monitoring is an inherent aspect of the air pollution control program because the obligation for compliance is on stationary sources generating the emissions. From a programmatic perspective, advances in the development of current continuous emission monitoring systems no longer pose the general concerns, as reflected by the comment, regarding the reliability of emissions information that is generated, recorded and reported by a regulated entity.

The issued construction permit requires Vantage to use a continuous emissions monitoring system on the stack of the affected emissions control system (to measure ethylene oxide concentrations in parts per billion by volume and a continuous monitoring system for the same control system (to measure gas flow rate in pounds/hour), both of which must be designed and operated to comply with applicable performance standards published by USEPA. *Condition 13(a) and (b)*. Operational monitoring and instrumentation for the affected control system for both scrubber flow rate and pH of the scrubber are also required. *Condition 14*. The process governing the determination of emissions from the affected process equipment, *Condition 15*, is also subject to Illinois EPA review (including the quarterly reports containing emissions relative to the annual emission cap) submitted to and reviewed by Compliance Section staff.

The permit also requires Vantage to implement a leak detection monitoring program, which will require monthly campaigns conducted for leaks from equipment components. This monitoring will consist of the use of hand-held instruments that are capable of measuring ethylene oxide and recording the concentration values (recorded to the nearest tenth of a ppm). A process for determining emissions from the read-outs of a monthly campaign must be completed 30 days after completion of the monitoring. Illinois EPA will review various records required to be kept by the construction permit, including the data recorded by the monitoring campaigns, quarterly reports addressing leaking components and repairs, as well as emissions relative to the annual emissions cap).

75. Does Illinois EPA track receipt of reports and obtain those that are late?

Yes, the Illinois EPA, Bureau of Air endeavors to ensure it receives the requisite reports from sources and that such reports are not only timely but complete. Matters such as failure to submit reports, failure to timely submit reports, or failure to submit complete or

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<sup>13</sup> An exception to this rule is when a law or regulation dictates the use of an independent contractor, as in the case of certain emissions testing and ambient monitoring provisions affecting ethylene oxide commercial sterilization sources under the Matt Haller Act (Public Act 101-0022). In the case of Vantage, neither the new law nor other provisions of the Environmental Protection Act impose the same type of requirements.

**accurate reports are generally handled by the Compliance Section in the Illinois EPA, Bureau of Air.**

76. What are the consequences for delinquent reports?

**There are numerous approaches for addressing delinquent reports. The approach taken is fact-specific. Notably, options include issuance of Violation Notices, execution of Compliance Commitment Agreements and the involvement of prosecutorial offices. For any violation, there is always the possibility that a civil penalty could result. Such penalties are not imposed by way of the permit but are instead a matter that must be addressed through the provisions of the Environmental Protection Act for enforcement. Whether an individual violation (or a pattern of violations) warrants consideration of a formal referral for enforcement by the Illinois EPA to the Attorney General's Office is a matter of enforcement discretion. The Attorney General's Office can initiate enforcement on its own prerogative and, likewise, the public can bring its own enforcement action for civil penalties against a polluter (or permittee) before either the Pollution Control Board or a local circuit court. Imposition of any penalty would be a matter that is addressed on a case-by-case basis.**

77. Would an emissions spike trigger a phone call or other inquiry to see if it is a single event or likely to be continuing?

**For the Vantage facility, the Illinois EPA will review the various notifications and reports submitted by Vantage pursuant to the permit, as well as conduct future inspections of the facility to assess compliance.**

78. How would one know if there is a decrease in fugitive emissions?

**The fugitive emissions are determined via measurements made in the leak detection and repair program and calculations associated therewith. Such numbers will be used to determine compliance with the permit and as a point of comparative reference.**

79. If available information for Vantage indicates an increase in ethylene oxide emissions what would be the Illinois EPA's response? Would there be additional technological or other changes at Vantage?

**An increase in ethylene oxide emissions would be indicated by either the continuous emissions monitoring data or the leak detection monitoring program data. The former relates to the stack emissions of the facility; the latter relates to the fugitive emissions from components. The collective data will be reviewed by the Illinois EPA. The nature of any Illinois EPA response and any requests for changes at the source or other demands would be based on considerations such as the nature and source of any elevations in ethylene oxide emissions, the duration, trends and cause of same, and whether the elevated emissions are causing any violations of applicable requirements.**

## Inspections and Audits

80. Is there anything in the permit requiring Illinois EPA to conduct an onsite “audit” of Vantage?

**The conditions of a permit are intended to address the obligations of a regulated source, in this instance Vantage. The obligations of the Illinois EPA are not addressed by permits but rather by provisions of relevant laws and regulations. As such, the construction permit does not require any on-site or other activity by the Illinois EPA. Notwithstanding, the Illinois EPA will necessarily review information received from the source and will conduct periodic on-site inspection.**

81. How often is a source like Vantage inspected?

**The type of permit the source operates under is a determinative factor. As a general matter, sources required to possess a Clean Air Act Permit Program permit, like this source, are inspected every two years. Given the concerns for ethylene oxide, the Illinois EPA is committed to on and off-site evaluations of this facility.**

82. Are inspections and on-site audits scheduled or unscheduled?

**Section 4 of the Environmental Protection Act affords broad inspection and information gathering authorities to the Illinois EPA. Inspections and audits by the Illinois EPA may be scheduled or unscheduled. Indeed, the Illinois EPA relies on both. The particular approach taken, or whether both approaches are used for a source, depends on the circumstances.**

83. How many inspections or audits were conducted of Vantage in 2019?

**Inspections or audits are a subset of the compliance and enforcement tools available to the Illinois EPA. Regulatory oversight of a source cannot and should not be measured by way of a subset of the oversight options, but rather in total. While there were no formal inspections of Vantage in 2019, there was significant oversight of and attention on the source. This oversight included modeling audits, review of emissions testing protocol, witnessing of emissions testing, review of emissions testing results, and record and report reviews.**

## Enforcement

84. What is the significance for enforcement by the Illinois EPA of a pattern of infractions or violations? Can unambiguous answers be given on when enforcement will be initiated?

**Enforcement by the Illinois EPA is fact and situation-specific. It would not be appropriate for the Illinois EPA to state what will or will not result in the initiation of an enforcement**



action. Enforcement can of course be initiated for a single violation. However, as a general matter, a pattern of violations can affect the response by the Illinois EPA. A pattern of violations is generally indicative of a more serious situation than a single violation as it suggests that appropriate corrective actions have not been taken. It makes it more likely that enforcement will be initiated. The closer in time that violations occur, the more suggestive that appropriate corrective actions have not been taken, making enforcement even more likely.

85. The permit should include provisions for civil penalties that are specified and not nebulous.

The Illinois EPA does not possess the legal authority to impose penalty requirements as part of a permit. This is because the permitting process under the Environmental Protection Act (the Act) is distinct from the enforcement program, which is where the concerns raised by the comments should be addressed. With limited exceptions, the permitting process focuses on whether an applicant can show that its emission-related activities will prospectively comply with applicable air pollution requirements under the Act. It can be noted that courts reviewing permitting decisions by the Illinois EPA have frequently observed that permitting is no substitute for enforcement.<sup>14</sup> This means that issues relating to a source's past or future non-compliance should be addressed through the Environmental Protection Act's enforcement program and not through permitting.

86. The final permit should include provisions for facility closure and/or review of Vantage's permit in the event of a permit violation, with allowance to reopen only upon a showing that all hazards have been cured.

For reasons similar to the above comment, the Illinois EPA cannot require, as part of the construction permit, an immediate shut-down or unilaterally reinstitute a review of the issued construction permit to address a permit violation occurring in the future. A permit violation is an enforcement consideration, not a permitting one. It is acknowledged that a permit reopening is authorized in some but not all types of permitting programs and are typically limited in scope (i.e., CAAPP's procedures allow reopening for incorporating newly-applicable Clean Air Act requirements into a permit). As mentioned elsewhere, the new law, Public Act 101-0023, authorizes the Illinois EPA to reopen the issued construction permit for reasons that relate to public health, but that basis for reopening may or may not correspond to a future permit violation.

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<sup>14</sup> See, *ESG Watts v. Pollution Control Board*, 286 Ill. App.3d 325, 335 (court acknowledging general recognition that it is improper for Illinois EPA to consider unadjudicated violations under Section 39(i)); *Illinois EPA v. Pollution Control Board*, 252 Ill. App.3d 828, 830 (3rd Dist. App. Ct., 1993)(appellate court affirming that "procedures for permit denial and enforcement of the Act are separate and distinct" and that Board did not error in "inference that the Agency improperly used the permit denial process as a substitute for the enforcement process").

87. The permit should include provisions that mandate the immediate shutdown of the Vantage facility if the total emissions cap of 110 pounds per year or the fugitive emissions cap of 60 pounds per year are exceeded.

**As already discussed, the Illinois EPA cannot impose immediate shut-down requirements upon this facility in the absence of statutory authorization. If Vantage fails to meet the annual emissions caps in the issued construction permit, the appropriate avenue will be to address such noncompliance through enforcement. Neither the Environmental Protection Act nor Public Act 101-0023 suggest that an immediate shut-down of the facility's operation is warranted for emissions exceedances or other infractions related to the permit. While the emissions caps contained in the permit can be viewed as significant as they are specifically required by the new law, that alone does not suggest that a violation of those requirements would satisfy the requirements for a preliminary injunction, which would necessarily serve as the legal basis for any immediate shut-down.**

88. Does the Illinois EPA have the authority to shut down a facility that poses an imminent danger to the public health?

**Yes. The Illinois EPA explained at the public meeting that the Environmental Protection Act provides for at least two mechanisms to compel a shut-down of a facility's operations. One avenue involves the Illinois EPA referring a matter to the Attorney General's Office for civil enforcement. More specifically, if the circumstances surrounding the matter pose "substantial danger to the environment or to the public health of persons," an immediate action for injunction could be brought by the Attorney General's Office before a court to stop the activity causing or contributing to the danger. *See, 415 ILCS 5/43(a)(2018).***

**The second avenue involves the Illinois EPA taking an administrative action to halt any activity at a facility posing "an imminent and substantial endangerment" to the public health the welfare or the environment. *See, 415 ILCS 5/34(b)(2)(2018).* Such an action would consist of the Illinois EPA placing a seal on any equipment, vehicle or facility that is contributing to the endangerment, which could be challenged by the owner or operator of a facility through a court or Pollution Control Board hearing or through immediate injunction. *See, 415 ILCS 5/43(d)(2018).***

89. If individuals are considering enforcement to redress violations by a source, must they prove that they have been harmed?

**As discussed at the public meeting, proof of adverse impact or harm is generally tied to a person's request for injunctive relief brought under the Environmental Protection Act (Act). The legal standard for such an action is at Section 45(b) of the Act, which provides that a person may sue for injunctive relief if "adversely affected in fact by a violation" of the Act, implementing rule or regulation, or condition of a permit. *415 ILCS 5/45(b)(2018).* This type of legal action would require persons to allege that their health or enjoyment of life and/or environment (e.g., daily activities at personal residences or outdoor activities)**

has been impacted through a source violation of an emissions standard or emissions-related requirement. There is no corollary requirement under the Act for an action brought for civil penalties, though evidence of such impact could certainly be considered as an aggravating factor in the consideration of the appropriate amount of civil penalty.

#### Other Questions and Comments

90. If this permit and the emissions cap is merely an incremental step to removing or banning use of ethylene oxide at the source, then simply ban use of ethylene oxide.

**There exists no ban on the use or emission of ethylene oxide in Illinois. The Illinois EPA does not possess the requisite authority to ban the use of ethylene oxide by Vantage or other sources in Illinois. As such, the Illinois EPA cannot deny or condition the permit so as to compel a shut-down of the facility because of the use of ethylene oxide. A ban or other type of restriction on the use of a product is, in the first instance, the province of the General Assembly and not an administrative agency such as the Illinois EPA.**

91. The Illinois EPA should do everything in its power to ensure that there are zero emissions of ethylene oxide near residential areas, schools and businesses.

**The Illinois EPA's implementation of the new law, including the establishment of the annual emission caps for ethylene oxide in the issued permit, will act to significantly limit the facility emissions of ethylene oxide when compared with its historic emissions. However, given the absence of emissions control technologies that effectively reduce ethylene oxide emissions to zero, a ban or other type of restriction on the use of ethylene oxide would not be within the authority of the Illinois EPA but, rather, would be within the domain of the General Assembly.**

92. Will the national standards for ethylene oxide be met?

**There is not a national ambient air quality standard for ethylene oxide. Ethylene oxide is one of a number of pollutants that Congress has classified as a hazardous air pollutant. The federal Clean Air Act generally requires the USEPA to regulate hazardous air pollutants by means of technology-based emission standards that address the effectiveness with which emissions are controlled. This is in contrast to criteria pollutants for which ambient standards are set that limit the amount of a pollutant that can be in the air, as well as with technology-based standards for the sources of emissions.**

**USEPA acknowledges that emissions of hazardous air pollutants create risk. But typically, for carcinogens, USEPA has not attempted to address such risk on a facility-specific basis if the risk to the most exposed person are under 100 in a million. The concentration of ethylene oxide associated with a 100 in a million risk, for a lifetime of continuous**

exposure is 0.02 microgram per cubic meter ( $\mu\text{g}/\text{m}^3$ ).<sup>15</sup> Concentrations and associated risks in this range have been deemed acceptable. These calculated risks related to ethylene oxide are general and not specific to any one individual. These risks are likely conservative, with what USEPA considers health-protective assumptions.

93. Please confirm that ethylene oxide is a Class IA carcinogen and mutagen.

Information available from the USEPA indicates that ethylene oxide is carcinogenic to humans and has been shown to be an effective mutagen in a variety of organisms from bacteria to mammals.

94. Why does Illinois EPA not refer to ethylene oxide as a carcinogen?

The Illinois EPA is a pollution control agency. The Bureau of Air is the department within the Illinois EPA charged with administering programs for control of emissions and air pollution. The Illinois EPA is not the agency directly charged with the protection of human health. In its statutorily authorized role, if the Illinois EPA and specifically the Bureau of Air is not directly referring to ethylene oxide by name, it would be appropriate to simply utilize terms such as contaminant, pollutant, or hazardous air pollutant when referring to ethylene oxide.

95. Why are the risks associated with ethylene oxide being minimized?

The risks associated with ethylene oxide are not being minimized by the Illinois EPA. Rather, the Illinois EPA is dealing with emissions of ethylene oxide to the full extent of its legal authority. The USEPA is charged with and would normally assess the need for and undertake any development of new or enhanced regulations for hazardous air pollutants such as ethylene oxide. However, given the delays associated with such assessments and developments, the Illinois EPA took action to impose enhanced requirements on both Vantage and the commercial sterilization sources in Illinois by way of permitting.

96. At what quantity are ethylene oxide emissions “safe.”

This comment relates to risk. Risk calculations are commonly used as a basis for regulatory actions. Risk calculations are not used as a measure of personal risk for myriad reasons not the least of which is the inability to determine personal exposure, which is critical to determining risk. Risk is addressed by way of the USEPA’s threshold for action, a lifetime cancer risk of 100 in a million. Impacts below this level are generally considered acceptable by the USEPA. The limits set forth in the permit will be sufficient to keep risk below this level.

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<sup>15</sup> The concentration of ethylene oxide associated with 1 in a million risk, for a lifetime of continuous exposure is .0002  $\mu\text{g}/\text{m}^3$ .

97. Can the Illinois EPA ask the USEPA to update the NATA map to better reflect the emissions from Vantage?

**This is not the first request of this type. Similar requests have been made to Illinois EPA and forwarded on to the USEPA. This is because this is a matter that is solely within the ability and discretion of the USEPA.**

98. Does the permit address failure or explosion of the dry bed scrubbers?

**The permit does not address the unlikely events of failure or explosion of control devices. Rather, it addresses the operations at a source in the ordinary course imposing provisions that address the emissions from the source and additional terms to verify compliance with the provisions relating to emissions.**

99. Are there standards addressing the risk of explosion from the storage of ethylene oxide and why aren't any such standards addressed in the construction permit?

**As a general matter, air pollution control permits address applicable air pollution control requirements and the means to assure compliance with such requirements. While there may be standards addressing risks associated with storage of ethylene oxide, this strays from air pollution control and certainly from the purpose of this permit. As previously stated, this permit is primarily for the purpose of imposing an annual cap on the emissions of ethylene oxide emissions from Vantage as mandated by the new law. Notwithstanding, risks associated storage and use of flammable and explosive materials such as ethylene oxide can be appropriately managed as is evidenced by the history in this regard at Vantage.**

100. Does the Illinois EPA have standards for the storage of ethylene oxide?

**No. The general assembly did not address storage of ethylene oxide in the new law. Additionally, there are not requirements under the Environmental Protection Act and regulations thereunder directly addressing the storage of ethylene oxide. Rather, the storage of ethylene oxide is subject to requirements outside the Illinois EPA's purview. For example, drum storage of ethylene oxide is addressed by international standards recommending storage of the drums in a "well-ventilated, fire-proof area, preferably away from other chemicals and outdoors."**

101. The Illinois EPA should consider whether the permit provides adequate protections relative to a shift at the facility from emission of ethylene oxide to emission of propylene oxide.

**Permitting is generally based on the information provided in the permit applications. The above scenario is not one addressed by the application at hand. Further, the purpose of this permit is to satisfy the express statutory requirement for an annual cap on ethylene**

**oxide emissions of the facility. Notwithstanding, it is the Illinois EPA's understanding that ethylene oxide and propylene oxide are used by Vantage for different products and are not interchangeable.**

102. The permit should stress more things like training of employees and operation and maintenance activities, rather than just recordkeeping.

**While employee training and even operation and maintenance requirements might seem like effective tools for control of emissions, they are less effective than direct recordkeeping. This is because they are difficult to verify and measure, in comparison to requirements that are objective and more straight-forward.**

103. Is there anything in the draft permit to protect the employees at the Vantage facility?

**This construction permit does not include provisions addressing worker safety. As explained, the purpose of this permit is to set a cap on the emissions of the facility. In addition, workplace safety is generally not addressed by the air pollution control permits issued by the Illinois EPA address the emissions from sources and how they are controlled. The Occupational Safety and Health Administration is the governmental body that is responsible for protecting employees in the workplace, including employees at sources of emissions.**

104. What was it about Sterigenics in Willowbrook that allowed that plant to be sealed, whereas the sources in Lake County with similar violations and emissions were not sealed?

**Compliance considerations relative to Vantage are not an aspect of this permitting transaction. Further, the basis for actions by the State of Illinois relative to the Sterigenics plant are not relevant to this permitting action. Notwithstanding, it must be noted that there is not information in the permit record evidencing substantive violations by Vantage. In addition, the ambient air monitoring for ethylene oxide in DuPage County near Sterigenics measured much higher concentrations of ethylene oxide than the ambient monitoring that has been conducted in Lake County near Vantage and Medline.**

**Additionally, at the time that the Illinois acted to seal Sterigenics from continued operation, there was no regulatory framework in place, either at the federal, state or local levels, to assure that ethylene oxide emissions observed from the ambient monitoring data would be controlled or reduced. This last summer, when the General Assembly enacted, and Governor Pritzker signed into law, amendments to the Environmental Protection Act addressing commercial sterilizers and nonnegligible ethylene oxide emission sources, a regulatory framework began to take shape. The new laws promised to bring about more stringent and effective emissions controls used by the affected facilities and, in doing so, reduce the risks potentially posed by chronic exposure to ethylene oxide emissions in nearby communities. The Illinois EPA is committed to implementation of**

**these new requirements, consistent with its existing legal authorities, and will continue to work with the General Assembly, other government officials and the public to address concerns in this area of environmental science.**

105. How does the public know that the data provided by the local, state and federal government is “kosher?” How do we trust these governmental entities, including the Illinois EPA?

**The conduct and oversight of activities regulatory bodies must be consistent with applicable local, state and federal legal requirements, i.e., applicable local ordinances, state law and regulations, and federal law and regulations. Any data provided by these bodies would be subject to these legal requirements. In particular, the Illinois EPA is a statutory creature born of law. Its duties and responsibilities and the manner in which it is to undertake these duties are likewise addressed in law. This framework directly speaks to this comment.**

106. The USEPA has issued new draft regulations for emissions of ethylene oxide. Will Vantage be required to comply with these new regulations?

**This comment relates to the USEPA’s proposed revisions to the Miscellaneous Organic Chemical Manufacturing National Emissions Standards for Hazardous Air Pollutants, announced in November. These rules only apply to major sources of hazardous air pollutants. Based on both its actual and permitted emissions, Vantage is not a major source of hazardous air pollutants and would not be affected by this proposed USEPA rulemaking.**

#### **FOR ADDITIONAL INFORMATION**

Questions about the public comment period and permit should be directed to:

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## Attachment 1: Listing of Significant Changes Between the Draft Construction Permit and the Issued Construction Permit

### Conditions 7(b)(ii) and 22(c)

These new conditions relate to notification to the Illinois EPA if a new party will conduct the periodic leak detection monitoring campaigns for affected components. Condition 22(c) in the issued permit requires Vantage to notify the Illinois EPA before a new party conducts these monitoring campaigns. Condition 7(b)(ii) in the initial part of the permit is a cross-reference to this requirement, which is in the third and last part of the permit. This new requirement in the issued permit responds to a comment expressing concern that the periodic leak detection monitoring that is currently conducted by a contractor could be performed in the future by Vantage. The required notification would inform the Illinois EPA of changes to the party that conducts leak detection monitoring and enable the Illinois EPA to, as appropriate, adjust its oversight of the leak detection monitoring that is conducted.

### Condition 7(b)(iii)

This new condition requires Vantage to notify the Illinois EPA if an event or incident occurs at the source in which ethylene oxide is emitted that is not otherwise accounted for in the emissions of affected process equipment or affected components, as addressed in Parts 2 and 3 of this permit, and for which notification or reporting is not provided pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or the Emergency Planning and Community Right-to-Know Act (EPCRA) and regulations thereunder. The type of situation would occur for an incident that involves an accident or emergency release for which the amount of ethylene oxide is less than the established reportable quantity under both CERCLA and EPCRA. For this purpose, these notifications shall be provided as soon as is practical after the occurrence of the incident, with an initial notification by telephone followed by a written notification. These new requirements respond to public comments that expressed concern that the permit would not address accidents and emergency releases of ethylene oxide that could potentially occur at the facility.

### Condition 13(a)(i) and (ii)

In Condition 13, which addresses the continuous emission monitoring device for process equipment, these two new conditions have been added to provide alternatives to certain requirements of USEPA's Performance Specification 15 (PS-15), "Performance Specifications for Extractive Fourier Transform Infrared Spectroscopy (FTIR) Continuous Emissions Monitor Systems in Stationary Sources." One alternative addresses the accuracy required for calibration gases. The other alternative addresses the standard for spike recovery, which is an element of the procedures for quality assurance. These alternatives, as addressed in the new conditions, respond to comments from the supplier of the monitoring device, Max Analytical Technologies. These comments explained that because the permit requires a limit of quantification of 20 parts per billion (ppb) for the monitoring device, which is a very low concentration, the established requirements in PS-15 for calibration gas and spike recovery are not appropriate. It also proposed alternatives to those requirements, as are included in the issued permit.



#### Condition 19(a)(iii)

This condition addresses the timing of the periodic leak detection monitoring for components in ethylene oxide service under the enhanced leak detection monitoring. In the issued permit, this condition has been clarified and enhanced. This condition more clearly states that periodic leak detection monitoring for subject components under the enhanced program must generally be conducted on a monthly basis. This includes monitoring in circumstance in which less frequent monitoring of components would be provided for by 40 CFR 60 Subpart VVa. For example, in circumstances in which 40 CFR 60 Subpart VVa only provides for monitoring of such components on a quarterly or annual basis, monthly monitoring would still generally be required. In this regard, under the enhanced monitoring program, the only circumstance in which monthly monitoring would not be required for the subject components in a process unit, as now explicitly stated in the issued permit, is in a year in which the process unit in which such components are located operates for 274 of the days or less during the year (about 75 percent of the days in a year or less). In this circumstance, leak detection monitoring may be conducted on a bimonthly or quarterly basis depending upon whether the process unit is operated, respectively, for 274 days or less in the year or 183 days or less in a year (about 50 percent of the days in a year). These changes respond to comments expressing concern that the draft permit would not have actually required monitoring for components that were never operating when the periodic monitoring was conducted. However, as reflected in 40 CFR Subpart VVa, the approach to process units that do not operate continuously is to require monitoring to be conducted when the process units are operating. A reduced frequency of monitoring is required for process units for which coordination of monitoring with the operation of the units may be more difficult because of the actual annual operation of the process units. In the issued permit, this condition almost more clearly indicates that periodic monitoring of subject components under the enhanced program is generally required on a monthly basis. This responds to comments that construed this condition in the draft permit to require monitoring on a quarterly basis.

#### Condition 20(a)(i)(B)

This new condition addresses how emissions are to be calculated for components for which there is only a single measured concentration for a period when the components were in place. It requires the emissions from such components for such period to be calculated using the concentrations that have been measured. This situation would occur for components that were installed after the previous monitoring campaign, for which the measurements in the current campaign would be the only measurements. This situation could also occur for components that are removed between the current and the previous monitoring campaign, for which the measurement in the previous campaign would be the only measurement. This condition has been included in the issued permit in response to a comment that expressed concern that leak detection monitoring should be required shortly after a component is installed or before it is removed. The approach in the issued permit to these components reasonably uses the data that is available for such components from the leak detection monitoring that would normally be conducted.

Condition 20(a)(i) (C)

This new condition addresses how emissions are to be calculated for components for which there is not a measured concentration for a period when the components were in place. It requires the emissions from such components for such period to be calculated using engineering principles and available information. This situation could occur for components that were both installed and removed between monitoring campaigns components. It could also occur for components for which leakage was identified by visual observation, such as droplets, spray, clouding or frost formation on a component. This condition has been included in the issued permit in response to a comment that expressed concern that components could be both installed and removed in a short period of time such that leak detection monitoring would never be conducted for such components. The approach in the issued permit to these components reasonably uses the data that is available to calculate the emissions associated with components or periods recognizing that requiring monitoring in such situations would interfere with actions that would act to reduce emissions.