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Odors

Introduction

Odors are sensations that occur when a mixture of compounds (called odorants) stimulate receptors in the nasal cavity. Because humans have an amazingly complex sense of smell, we can detect vast quantities of odors that can affect us in many ways. Very strong odors can result in nasal irritation, trigger symptoms in individuals with respiratory problems, or add to the stress a person is feeling. The smell of odors, whether pleasant or unpleasant, is induced by breathing in airborne volatile organic or inorganic compounds.

The Nebraska Department of Environmental and Energy (DEE) does not regulate odors but does regulate certain pollutants that have odors. For example, DEE does regulate Total Reduced Sulfur (TRS), which can be detected by its rotten egg odor. Sources of TRS include wastewater treatment plants, livestock operations, and tanneries.

Odor Sources

Odors can originate from many sources. In Nebraska, major sources of odor complaints are wastewater treatment plants and livestock operations. With the increasing numbers and sizes of livestock operations in the past few years, the DEE has received more frequent complaints regarding the odors associated with these operations. But there are many other sources that the department recognizes and investigates. Odors can result from a single source, a single event, or a combination of several sources and events. A brief inventory of some odors and their possible sources follows:

- Odors from an animal production site originating from animal housing (including open lots), manure storage structures, and land application of manure. Other sources such as dead animal disposal sites, silage piles, feed centers, and any other areas where organic matter is present may also contribute to odor emissions.
- Coal-burning electric utilities produce sulfur oxide emissions in the form of sulfur dioxide (SO₂), a heavy, colorless gas with an odor similar to a struck match.
- Printing, rubber, and leather industries use a solvent called xylene. It is also used as a cleaning agent, a thinner for paint, and in paints and varnishes. Xylene is a colorless, sweet smelling gas.
- Toluene is a major component of paint and is emitted from painting operations. It is used in the production of nylon, plastic soda bottles, other organic chemicals, and in some printing and leather tanning processes. Toluene is a colorless gas that has a sweet pungent odor.
- Phenol is used in the making of plywood, and in the construction, automotive, and appliance industries. It is also used in the production and manufacture of nylon and epoxy resins. Phenol is a colorless gas that has a strong sweet odor.

The world around us is full of various odors, some considered pleasant, others considered unpleasant. Whether an odor is offensive or not is subjective, based upon individual preferences, sensitivities, and experiences. Something that has an odor may not be harmful to public health, even if the odor generates a physical response such as nausea. The DEE's authority with regard to air quality is limited to regulating air pollutants that are harmful to public health. Often, these "public health" limits do not eliminate associated odors.

DEE Regulates Pollutants

Although DEE does not regulate odors, the department will investigate some types of odor complaints. If DEE determines the complaint is in regard to a pollutant the state regulates, DEE staff document it and contact the alleged source. However, unless the source is in violation of a permit condition or regulation, the state cannot require the source to take corrective action. If DEE does not believe the odor complaint is in regard to a regulated pollutant, the complainant is referred to local authorities regarding the applicability of a local nuisance ordinance, if one exists. If requested, the complainant is notified of the action taken in respect to a complaint investigated by the DEE. Any ammonia odor complaints are referred to the State Fire Marshal.

If an odor complaint is received regarding a livestock operation that has a Best Management Plan in its state operating permit, DEE staff will investigate to determine whether the facility is properly following their plan. The *Guidance Document [Best Management Practices for Odor Control](#)*, NDEE, October 2021 provides information on available odor control practices and technologies for livestock operations. This document is provided to all applicants for livestock waste control facilities.

Summary

Odors are often a serious issue and can originate from a variety of sources and may induce some health symptoms. Although odors themselves are not regulated the DEE will investigate odor complaints in accordance with the authority granted by the State of Nebraska. Quite often, the source of the odor is not a regulated pollutant, and the odor is not harmful to health. In these cases, DEE cannot take action against the source, but can work with the source to implement voluntary odor controls. Local governments adopting a nuisance ordinance may be able to achieve odor regulation at the local level depending on their authority. If you have any questions, please contact the Nebraska Department of Environmental and Energy, Air Quality Program 402-471-2186.

References

1. BEAM Chemical Fact sheet, PHENOL, Maine DEP, n.d.
2. BEAM Chemical Fact sheet, SULFUR DIOXIDE, Maine DEP, n.d.
3. BEAM Chemical Fact sheet, TOLUENE, Maine DEP, n.d.
4. BEAM Chemical Fact sheet, XYLENE, Maine DEP, n.d.

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