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Odor and Corrosion Control with Nitra-Nox for Hydrogen Sulfide Prevention

FOR MUNICIPAL COLLECTION SYSTEM APPLICATIONS

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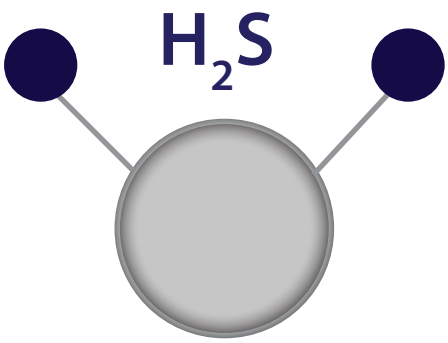
Hydrogen Sulfide



What is Hydrogen Sulfide?

Hydrogen Sulfide (H_2S) is a colorless, toxic, highly flammable gas with a foul, pungent odor similar to that of rotten eggs. Often referred to as "sewer gas", H_2S is a result of the breakdown of organic matter by bacteria, typically in an oxygen deprived environment such as a metropolitan sewer system or wastewater treatment plant.

Controlling this hazardous gas is one of the most challenging problems facing industry today. Not only is it a nuisance, H_2S has the potential, even at low concentration levels, to pose extreme safety hazards for plant personnel, while its corrosive nature is detrimental to plant and collection system equipment. The concentration levels of H_2S in most wastewater collection systems and sludge processing plants are dependent on several factors.

Agitation

Although agitation does not affect the amount of H_2S produced, it does play a factor in how much H_2S is released. The greater the agitation in a manhole or pump station, the greater amount of H_2S that will be released into the air.

Microorganism and Sulfate Counts

Sulfates serve as an oxygen source for microorganisms in the wastewater stream. When sulfates are consumed, H_2S is produced by the microorganisms as a by-product. Thus, the greater the sulfate levels in the wastewater stream, the greater concentration of sulfate reducing bacterium that produce H_2S.

Temperature

Sulfate reducing bacteria thrive in the wastewater stream in elevated temperatures up to 98°F. Therefore, the higher the temperature of the wastewater, the greater concentration of sulfate reducing bacterium that produce H_2S.

Residence Time

Everyday, miles of sewer lines are installed to accommodate economic expansion. As a result, sewer lines are often oversized to compensate for the rapid growth. These oversized sewer lines lead to greater wastewater residence times. High levels of H_2S are produced during these residence times.

Dangers of Hydrogen Sulfide Exposure

Hydrogen Sulfide is most commonly recognized by its distinct smell.

However, prolonged low-level exposure and short term moderate level exposure will cause loss of smell even though the gas may still be present.

Low Level Concentrations

- Irritation to eyes, nose, throat or respiratory system
- Severe headaches
- Fatigue

Moderate Level Concentrations

- Severe irritation to eyes, nose, throat and respiratory system
- Dizziness and confusion
- Nausea and vomiting
- Difficulty breathing
- Possible loss of consciousness

High Level Concentrations

- Seizures and convulsions
- Inability to breathe
- Possible death

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Hydrogen Sulfide

H_2S Toxicity Chart

10 ppm	Can smell. Safe for 8 hours exposure.
100 ppm	Kills smell in 3-15 minutes. May sting eyes and throat.
200 ppm	Kills smell quickly. Stings eyes and throat.
500 ppm	Lose sense of reasoning and balance. Respiratory paralysis in 30-45 minutes. Needs prompt artificial resuscitation. Will become unconscious quickly (15 minutes maximum).
700 ppm	Breathing will stop and death will result if not rescued promptly. Immediate artificial resuscitation is required.
1000 ppm	Immediate unconsciousness. Permanent brain damage may result unless rescued promptly.

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Nitra-Nox | Odor Control for Hydrogen Sulfide Prevention

NITRA-NOX

A Leader In The Fight Against Hydrogen Sulfide (H_2S)

Odor/corrosion control and H_2S prevention represent one of the biggest problems facing the wastewater industry today. Aulick has combined the chemistry of H_2S encapsulation and prevention creating an improved and more effective Nitra-Nox.

Nitra-Nox is a naturally proven solution used to prevent the production of H_2S in wastewater. H_2S is produced when the anaerobic bacteria feeds on sulfates. Nitra-Nox is an alternative oxygen source, preventing future production of H_2S. With our latest encapsulation technology, Nitra-Nox can also be fed where H_2S is already present. Nitra-Nox will encapsulate the H_2S and prevent it from being expressed and enable future production to be prevented.

Features & Benefits of Nitra-Nox

- Non-hazardous
- Prevents corrosion to wastewater system and equipment
- Does not affect pH of wastewater
- Preventative chemistry
- Specialized dosing systems
- Reduces health threats to workers
- Cost-effective
- Reduces BOD
- Fights other odors found in wastewater

Key Feed Locations for Nitra-Nox in a Sewage Collection System with Odor Problems

It's not 'one size fits all' when it comes to odor control in the sewage collection system.

The odor itself and location of odor must first be identified. Next, the location where the odor is produced and concentration of the odor must be known. In the situation presented, odor complaints were originating at manholes receiving all flow prior to the wastewater treatment plant, and at the air release valve on the force main from Pump Station 1 in the diagram.

To alleviate the odors, Aulick evaluated the entire collection system.

For the hydrogen sulfide issue at manhole 1 prior to the wastewater treatment plant, the entire system was tested for hydrogen sulfide using an OdaLog gas detection logger.

For the odor issue at the release valve, the hydrogen sulfide level was measured at Pump Station 1.

The 0 ppm reading indicates a perfect location to feed Nitra-Nox and inhibit the production of hydrogen sulfide in the force main.

See diagram continued on next page.

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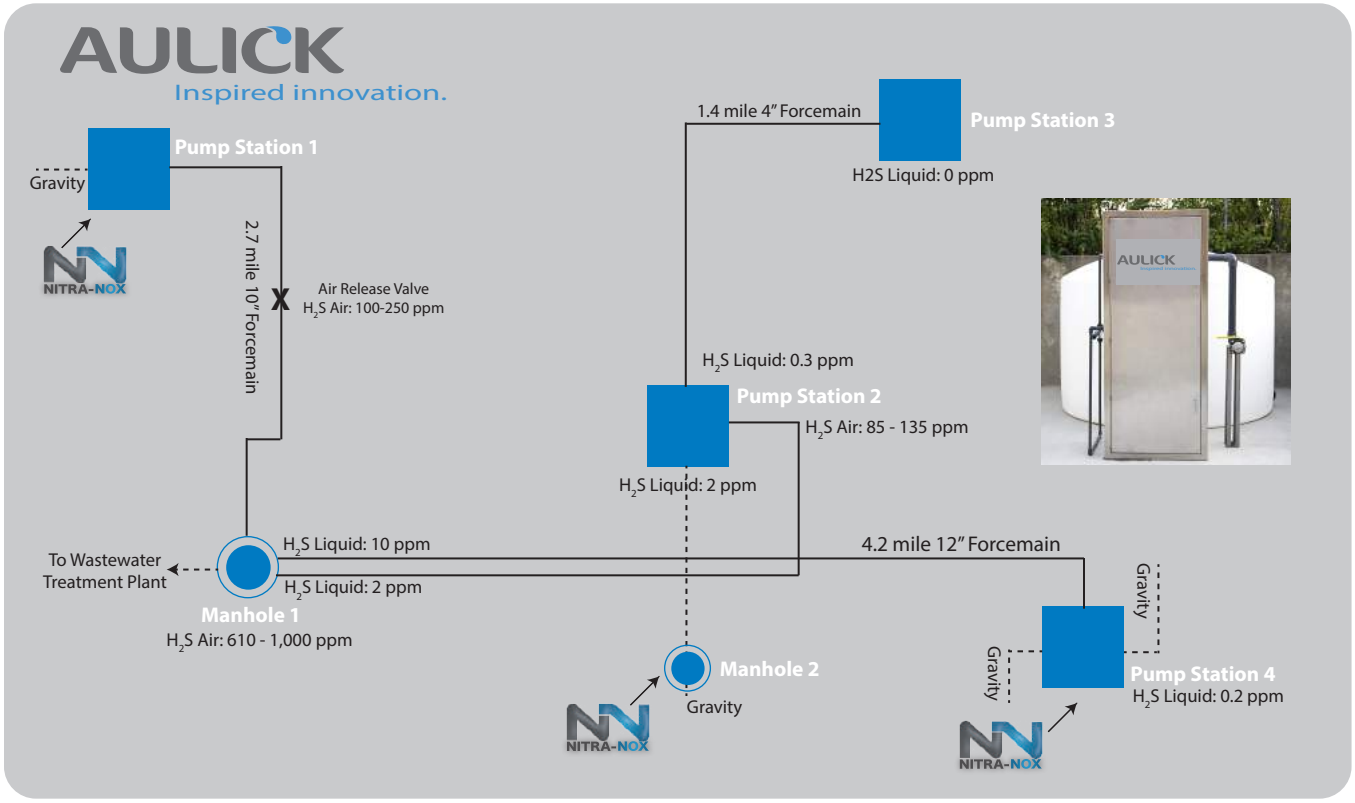
Nitra-Nox | Odor Control for Hydrogen Sulfide Prevention



Discharge H_2S Liquid Levels

Pump Station 1	6.5 ppm
Pump Station 2	2 ppm
Pump Station 4	10 ppm
Pump Station 3	0 ppm

The hydrogen sulfide coming from Pump Station 1 will be inhibited by feeding at Pump Station 1. The hydrogen sulfide coming from Pump Station 4 will also have to be treated at Pump Station 4.

The hydrogen sulfide coming from Pump Station 2 is further evaluated and it's determined that the majority of the hydrogen sulfide is coming from the gravity flowing into Pump Station 2.

Feeding Nitra-Nox at Manhole 2 will inhibit the hydrogen sulfide at Pump Station 2 and discharge into manhole 1 prior to the wastewater treatment plant.

Nitra-Nox is available in 55 gallon drums, 330 gallon totes, and bulk truck loads of 3000 gallons or more.

NITRA-NOX

H_2S Monitoring & Reporting Program




Providing the latest technology to abate offensive odors is a priority at Aulick Chemical Solutions. For the last 20 years, Aulick has continued to develop innovative products to eliminate and prevent hydrogen sulfide and control odor and corrosion in the collection system and at the wastewater treatment facility.

With the ever-changing parameters and substrates in wastewater, odors such as H_2S have become notorious. Because of the changing H_2S levels, Aulick is committed to go further and offer detection, monitoring, and reporting to our customers.

Aulick understands that every wastewater system is different and requires customized solutions. We customize monitoring strategies to meet each customer's needs.

H_2S Monitoring & Reporting Program

Services:

- Liquid/air sampling & monitoring using OdaLog gas data logger
- Odor identification
- Monitoring areas such as lift stations, manholes, belt press, plant influent flow and air release valves
- Monitoring pH, temperature, wastewater flow, and current weather conditions
- Monitoring and adjusting chemical feed systems
- Complete chemical feed systems installation and repair
- Report preparation and submittal for each site tested
- Quick response to problems or questions
- Weekly, monthly, and quarterly services available
- Site investigation and reporting on source of odor
- Technical support for permit compliance

The OdaLog® is a portable gas detector specifically designed for the wastewater industry, manufactured by App-Tek International – the industry-proven gas detection specialist for harsh environments.

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Reliable Delivery

24-48 Hour Bulk Delivery Capabilities

Our corporate headquarters, manufacturing facilities, fleet lot, and engineered chemical feed systems division are located just south of Lexington in Nicholasville, KY. Our fleet of vehicles consists of tractor trailer tankers and tandem straight tankers for quick, reliable, and local chemical deliveries.

Our smaller fleet, box trucks, and utility vehicles (as well as third party carriers) are perfect for drum and tote deliveries and allow us to deliver our chemical solutions on time and as expected.

Delivery

- 24-48 Hour Delivery Capabilities from Central KY
- Bulk - Tractor Trailer Tankers - 4400 and 4200 Gallon
- Tandem Straight Tankers - 3700 and 3600 Gallon

Additional Packaging

- Bulk
- 330-Gallon Totes
- 275-Gallon Totes
- 55-Gallon Drums
- 5-Gallon Pails
- Gallon & Quart

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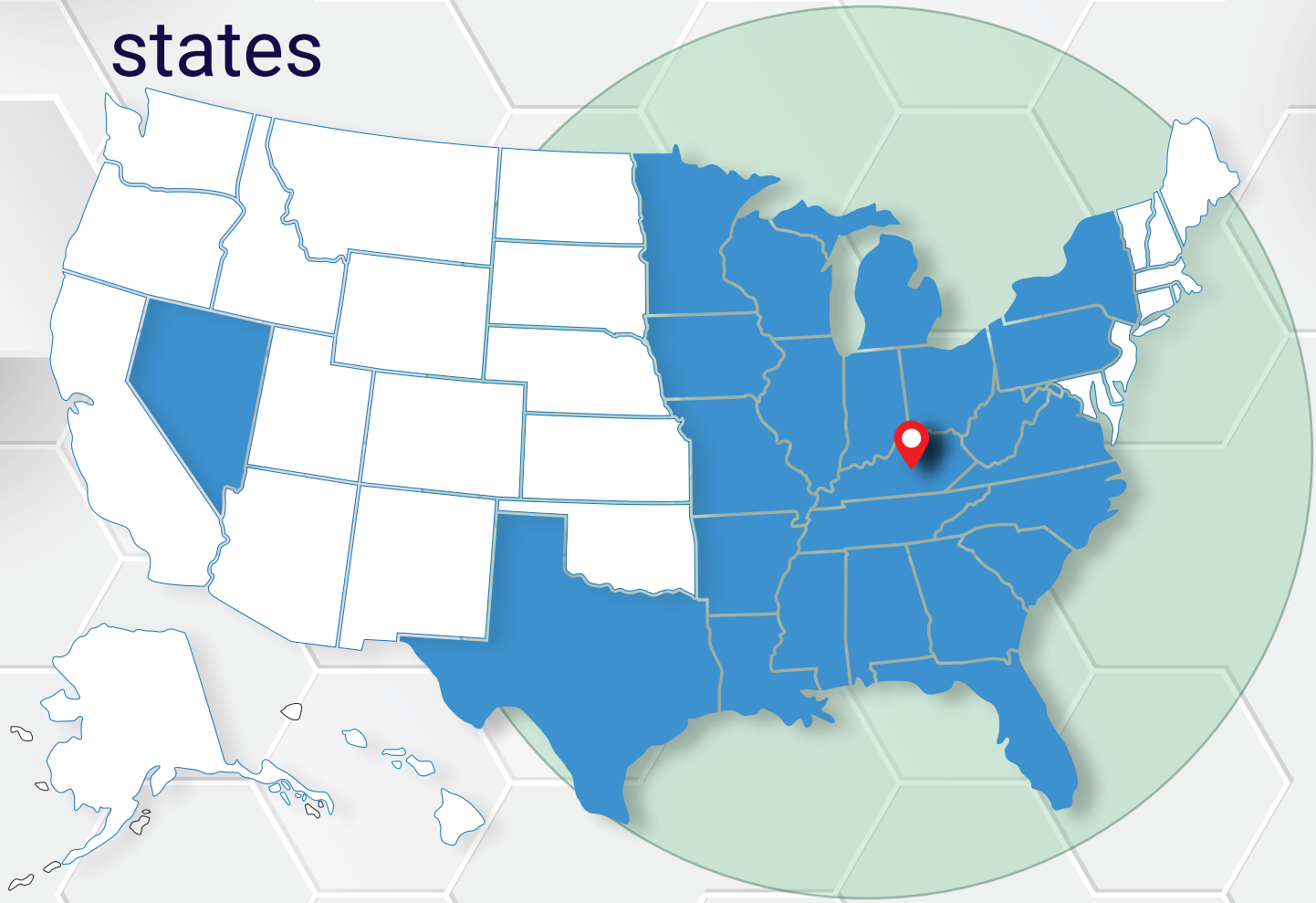
Coverage | Centrally Located. Equipped To Serve.

Serving more than 22 states



Aulick proudly supports customers throughout the Southeastern U.S. and beyond.

With over 22 years of experience, our capabilities and dedication to great service are what set us apart.