



King County

Department of Natural Resources and Parks
Wastewater Treatment Division

NORTH MERCER ISLAND/ENATAI

Sewer Upgrade Project

Odor Control: Taking Steps to Stop the Stink

What's Happening... and Why

This fact sheet explains what causes sewer odors, the best tools for controlling them, and the specific odor-control plans in place for the North Mercer/Enatai (NME) project.

Modern sewer systems are designed to hold sewage odors. Pipes and equipment are built to prevent sewer gases from escaping. However, on a long system like the planned NME sewer pipeline, there are points along the way where sewer odors are more likely to be released.

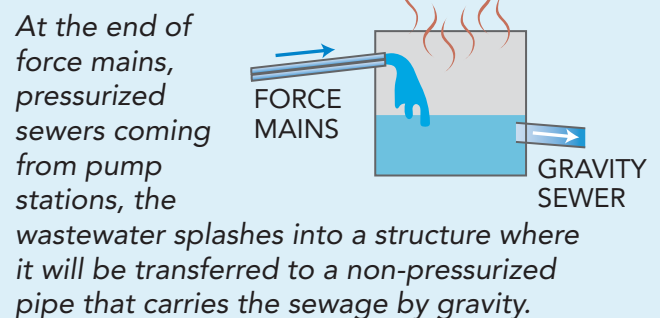
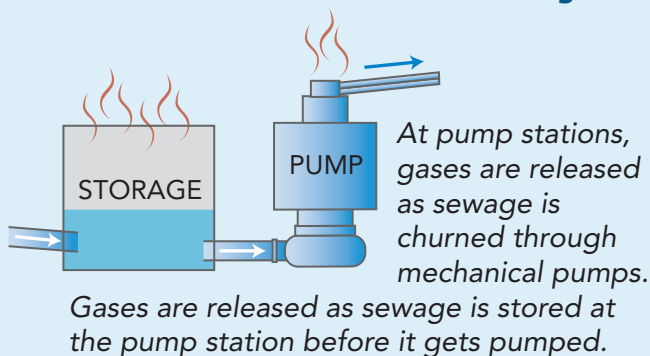
We cannot guarantee that there will be no odors in the system. However, King County is committed to managing sewer smells as much as possible. Being a good neighbor by controlling odors is part of normal operation of our facilities. We continuously check our pipes, pump stations, and treatment plants for odors. Then we take steps to keep them in check.

Sewer Project Overview

King County is upgrading three miles of sewer pipeline across north Mercer Island and south Bellevue. It is a big project that has been years in the making and will involve years of construction. The work will be in heavily used public spaces, and in some residential areas. The end product will provide great public benefit, but the work to get there may involve inconveniences to residents and users of public spaces.

We are committed to keeping you informed about what is happening and why, to minimize impacts on the community. This is one of a series of fact sheets that explains the NME project and what the public should expect—during construction and after the work is done.

Locations in treatment system where odors can be generated



At high points along force mains, it is sometimes necessary to release trapped gases to control internal pipe pressure.



Transitions at the beginning and end of sewer siphons are prone to the creation of odors.

King County responds immediately to citizen complaints about odors. If you smell something, call us on our 24-hour hotline: 206-263-1760

How does odor control work?

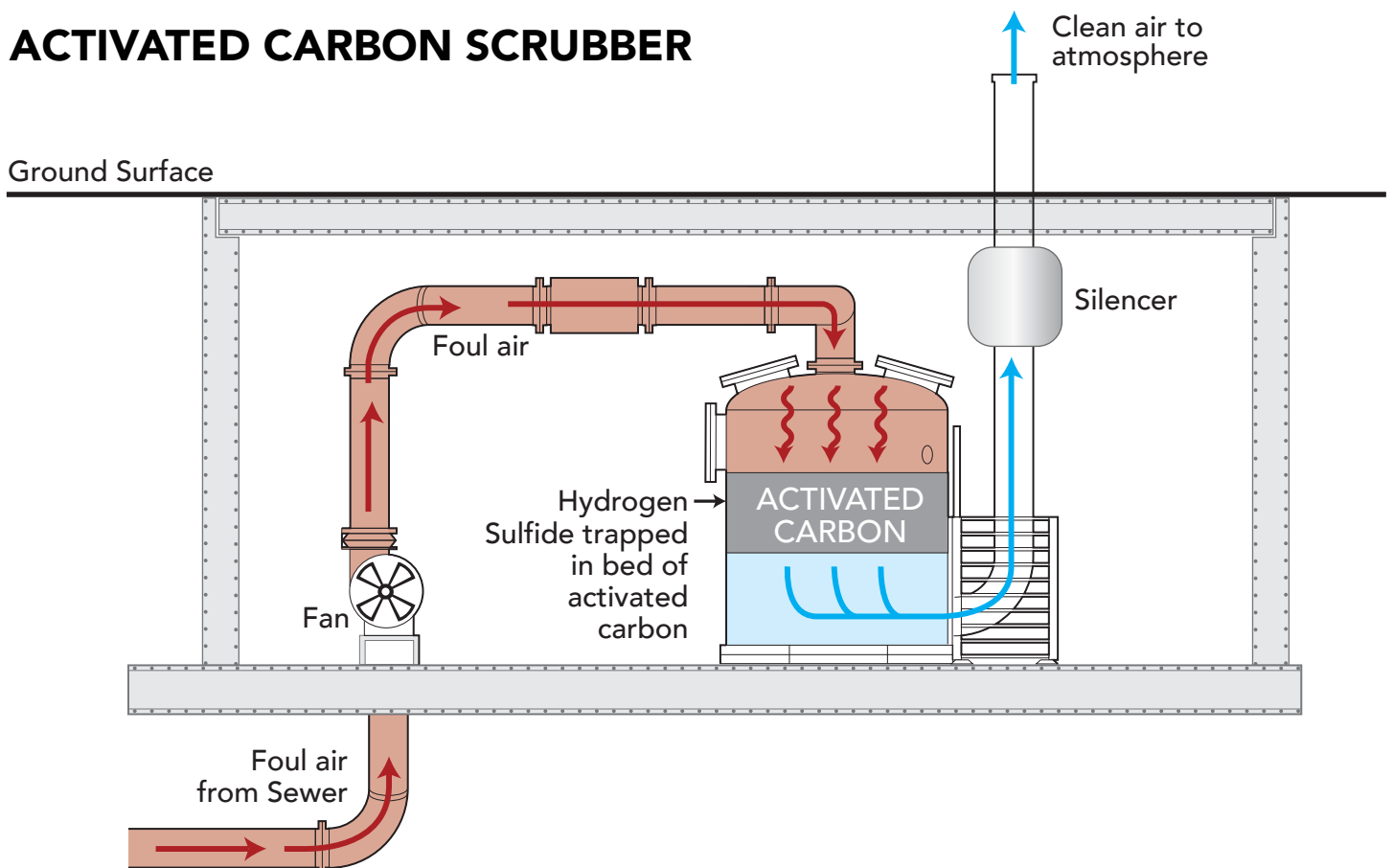
Sewer odor control methods are all about keeping smelly hydrogen sulfide (H₂S) away from nearby noses (see more on the next page). These methods fall into two typical approaches:

- Adding chemicals (also called biological enzymes) at areas along our pipeline network to control the amounts of H₂S in the wastewater. This is called “liquid-phase” odor control.
- Installing odor scrubbers to capture the H₂S as soon as it leaves the wastewater and keep it from spreading through the air. This is called “vapor-phase” odor control.

The overall odor-control approach for the upgraded North Mercer/Enatai Interceptor system relies on both methods, specifically including the following:

- **Bioxide injection (liquid phase)**—A patented solution called Bioxide, which contains a chemical called nitrate. Bioxide is added to the wastewater stream. Then some bacteria in the wastewater can use the added nitrate to react with the H₂S and turn it into non-smelly compounds (sulfate, water, nitrogen and hydrogen).
- **Activated carbon scrubbers (vapor phase)**—A fan draws foul air out of the sewer and forces it through a bed of carbon granules (see the picture to the right). The smelly H₂S attaches to the carbon. Then the clean air is vented to the atmosphere.
- **Passive carbon canisters (vapor phase)**—Passive carbon canisters work essentially the same as activated carbon scrubbers, but they are placed where the sewer gas is naturally escaping to the atmosphere. This means there is no need for a fan system to draw the air through the carbon.

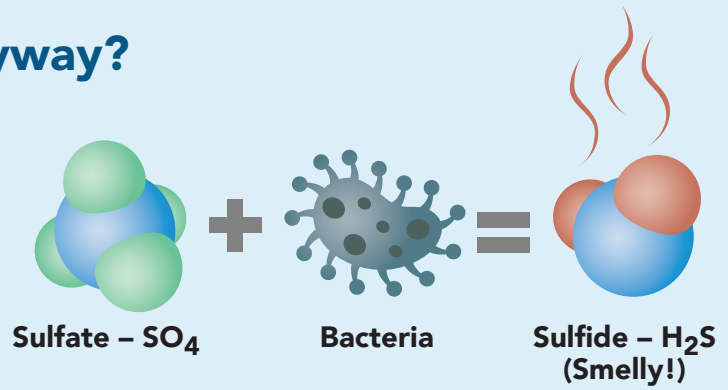
ACTIVATED CARBON SCRUBBER



Why Does Sewage Stink, Anyway?

Everybody knows that sewage smells bad. But why? What are those odors, and where are they coming from?

In a sewage collection system like the NME system, the answer is more complicated than you might imagine. It's all about bacteria and their need for oxygen.



In closed sewer systems, oxygen in the wastewater can be limited. In low-oxygen conditions, some kinds of bacteria get needed oxygen from a material called sulfate. Sulfate is common in waters all around the world. It consists of sulfur and oxygen. When certain bacteria use the oxygen from sulfate, it causes a chemical reaction that leaves the leftover sulfur combined with hydrogen. This new molecule is called hydrogen sulfide (H₂S).

To put it bluntly: H₂S stinks. People say it smells like rotten eggs (in fact, it's the chemical that makes rotten eggs smell the way they do). It's the primary source of unpleasant smells from sewage.

H₂S doesn't dissolve well in water. Anywhere the collection system gets contact with open air, the H₂S comes out of the water and goes into the atmosphere. There it quickly spreads—to the annoyance of any nearby nose.

What's the odor-control plan for this project?

We need odor control where different types of pipes connect. These are the locations where we will install permanent odor control units.



What to expect when the project is complete

When construction of the North Mercer/Enatai Sewer Upgrade project is finished, odor control systems will be mostly hidden. Almost all of the equipment will be underground and out of sight. At the North Mercer Pump Station, above-ground equipment will be behind screens; the exhaust vent may be taller than the screens, but it will be designed to blend in with the pump station buildings. At all other odor control sites, the only visible structures above ground will be exhaust vents, electrical control cabinets, and hatches flush with the ground that provide access to the equipment below.

The only noise generated by the odor control facilities will be from the fans for the activated carbon scrubbers. At the underground scrubbers along the conveyance system, the fans will be in the underground vault with rest of the equipment and will have silencers on their exhausts. The fan at the North Mercer Pump Station will be above-ground in a sound-reducing enclosure and will have a silencer on its exhaust as well.

Maintenance crews will need to check and replace the carbon beds on odor control units once or twice a year, depending on needs. When replacement is needed, crews will bring in large trucks to clean out the old carbon. Maintenance work will be short and infrequent.

With the planned odor control facilities, equipment will work around the clock to minimize odors from escaping the sewer system into the surrounding community.

What's Next

King County is currently bringing contractors onboard. Once all documents and paperwork are finalized, construction is expected to begin in the spring of 2022. Overall, construction will take four years, though most work locations will see shorter durations.

Our team will share information, so neighbors know what to expect during construction and beyond. Here is what you can expect from us this year:

- Attendance at community events*
- Project newsletters, fact sheets, and field work notifications
- Monthly project web updates
- Online/in-person open houses*

- Briefings online/in-person for interested community groups*

We are committed to continuing to be a good neighbor during construction. We will share information about construction and impacts on Enatai Beach Park on our website, in project emails, and through posted information at the park.

We are always available to talk to you and your neighbors at small group meetings, in living rooms, and at stops along the future pipeline. Just let us know!

**In accordance with Seattle/King County Public Health guidelines.*

NORTH MERCER ISLAND/ENATAI Sewer Upgrade Project

Talk to us! Questions? Concerns? Contact the project team:

The community services team at **425-305-3578** or **NMEsewer@kingcounty.gov**
Visit the project Web page at **www.kingcounty.gov/MercerEnataiSewer** Sign up for email and text alerts on the project Web page.



Alternative formats available
206-477-5371 or TTY replay: 711

@KingCountyWTD

