

This Frequently Asked Questions (FAQ) is based on comments received during the public comment period of the Special Order by Consent (SOC) for the City of Greensboro T.Z. Osborne WWTP.

In 2015, North Carolina Department of Environmental Quality (DEQ) sampling indicated elevated levels of 1,4-dioxane in South Buffalo Creek below the City of Greensboro's T.Z. Osborne WWTP effluent discharge. In response, the City of Greensboro began a 1,4-dioxane source identification and reduction plan which included monitoring of the City's wastewater treatment plant (WWTP) and wastewater collection system. By October 2015, the City had identified one of its Significant Industrial Users (SIU) as one source of 1,4-dioxane to the WWTP. The identified SIU began its own source reduction plan, and the levels of 1,4-dioxane in the T.Z. Osborne WWTP effluent discharge subsequently decreased by 50% since 2016.

Beginning in December 2017, DEQ required the City of Greensboro to begin monthly effluent sampling at the T.Z. Osborne WWTP and report data on monthly discharge monitoring reports. As part of the City of Greensboro's efforts to further reduce 1,4-dioxane from the T.Z. Osborne WWTP effluent, the City applied for a Special Order by Consent (SOC) in November 2019. After a draft SOC was agreed to by both parties, it was sent to public notice, which ran from June 22, 2020 through July 24, 2020. This public notice period allowed interested parties to review the proposed SOC and submit comments. During this public notice period, DEQ received 344 comments from 331 individual commenters. The primary concerns raised were that DEQ has the authority to regulate and hold responsible the City of Greensboro and industry, that discharge concentrations should be reduced, and that a public hearing should be held on the proposed SOC.

In response to public comments received on the proposed SOC, DEQ made several changes to the document and the City of Greensboro agreed to these changes. The most significant of the changes includes: (1) the reduction of the compliance value in Year One of the SOC, (2) the removal of the word voluntary in regard to source reduction in Year One of the SOC, and (3) the clarification that the compliance values for each SOC year take effect on the respective first day of each year. The revised version of the SOC incorporates the changes mentioned above and will go out to a second public notice period with an accompanying public hearing.

What is 1,4-dioxane? Why is it in the environment?

1,4-dioxane is a chemical compound and byproduct found in many consumer goods such as paint strippers, dyes, greases, plastics, antifreeze, aircraft deicing fluids, and in trace amounts in some consumer products such as deodorants, shampoo, and cosmetics. 1,4-dioxane can also be used as a purifying agent in pharmaceuticals manufacturing. Traces of 1,4-dioxane may be present in food supplements and packaging adhesives or on food crops treated with pesticides. Due to this broad range of uses, 1,4-dioxane is widely distributed in the environment.

With this widespread environmental distribution, 1,4-dioxane has been detected in some drinking water supplies and reservoirs at levels greater than 1.0 µg/L. Therefore, even if Significant Industrial Users (SIUs) are able to stop releasing 1,4-dioxane to POTWs in wastewater flows, there may still be a background level present from other historical sources in surface waters that would prevent POTWs from obtaining the In-stream Target Value of 0.35 µg/L in surface waters classified as water supply.

What are 1,4-dioxane regulatory requirements?

Regulations in 15A North Carolina Administrative Code (NCAC) 02B, administered by the Environmental Management Commission (EMC), provides DEQ the ability to offer numeric interpretations of narrative standards for toxics detected in the surface waters of North Carolina. A value of 0.35 micrograms per liter ($\mu\text{g}/\text{L}$) is calculated as the "In-Stream Target Value" for the protection of humans in "water supply" (WS) classified waters. An "In-stream Target Value" reflects calculations for acceptable risks based on best available data. These values assume a cancer risk level of one additional occurrence of cancer per million people.

In September 2017, EPA established a standard wastewater analytical method for sampling 1,4-dioxane in 40 CFR Part 136 as Analytical Method 624.1. Grab samples are the required collection method, and the practical quantitation limit (PQL) (i.e. the lowest level the method can detect) is 1.0 $\mu\text{g}/\text{L}$ due to limitations in current technology.

North Carolina regulates drinking water suppliers using the EPA Safe Drinking Water Act Maximum Contaminants Level (MCLs). Currently, there are no federal EPA MCL requirements for 1,4-dioxane for finished drinking water consumption. The EPA's Office of Water developed Health Advisory levels for 1,4-dioxane of 35 $\mu\text{g}/\text{L}$. Health advisories provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water. EPA's health advisories are non-enforceable, non-regulatory, and provide technical information to state agencies and other public health officials on health effects, analytical methodologies, and treatment technologies associated with drinking water contamination. EPA's health advisory level for 1,4-dioxane offers a margin of protection for all Americans throughout their life from adverse health effects resulting from exposure to 1,4-dioxane in drinking water. The EPA chose a cancer risk level at 1 additional occurrence of cancer per 10,000 persons as the target risk. While the EPA has listed 1,4-dioxane as a chemical of concern, after review, it was not selected for regulation development. Therefore, the non-regulatory Health Advisory of 35 $\mu\text{g}/\text{L}$ remains in effect.

The state has considered the calculated In-stream Target Values and the US EPA's Drinking Water Health Advisory value for 1,4-dioxane when developing 1,4-dioxane reduction plans in order to protect aquatic life and fish and water consumption uses downstream. The state continues to monitor surface water quality throughout North Carolina to provide insight into the potential effects of 1,4-dioxane concentrations reported.

How does the pretreatment program work?

The Pretreatment Program is a nationwide program designed to prevent pass-through, interference, and other adverse impacts to publicly owned treatment works (POTWs) from industrial wastewater. Process wastewater discharged to POTWs from industrial facilities has the potential to include chemical substances and contaminants. In general, POTWs are not designed to treat toxic or chemical contaminants, so the pretreatment program functions to reduce, eliminate, or alter these pollutants before they can enter the sanitary sewer system. Otherwise, these substances could pass through the

wastewater treatment system without being treated or can interfere with the treatment process, making it less effective.

This program is mandated under the federal Clean Water Act (CWA). DEQ delegates pretreatment program responsibilities to local governments that own and operate POTWs, which in turn permit SIUs within their systems. These requirements are enforced through the NPDES permit issued to POTWs by DEQ. Local POTW officials are most familiar with their industrial users and are generally in the best position to recognize and correct problems within their own treatment systems. Greensboro's Pretreatment Program is administered by DEQ as the Oversight Authority with the City of Greensboro as the Control Authority. POTWs are required to meet the mandated CWA pretreatment objectives by establishing discharge standards for pollutants of concern and identifying and issuing permits to SIUs. POTWs ensure SIUs comply with permits by conducting facility inspections and reviewing submitted reports. POTWs must adopt the federal pretreatment standards into their sewer use ordinance and develop local limits to adequately protect their collection and treatment systems. There are over 600 SIUs who discharge industrial wastewater to more than 110 POTWs throughout the State of North Carolina.

What is an SOC? How does it relate to the T.Z. Osborne WWTP?

A Special Order by Consent (SOC) is an agreement between DEQ and a permittee to bring a facility into compliance when the facility is unable to consistently comply with the terms, conditions, or limitations in a permit. An SOC allow limits for particular parameters to be relaxed, but only for a time determined while tangible actions are undertaken to fix the underlying problems causing the noncompliance .

On November 14, 2019, DEQ issued a Notice of Violation and Intent to Assess Civil Penalties against the City of Greensboro for a discharge of 1,4-dioxane of 957.5 µg/L that occurred on August 7, 2019. DEQ calculations predict that 1,4-dioxane concentrations of this magnitude within the T. Z. Osborne WWTP effluent discharge may have caused the instream concentration of 1,4-dioxane to exceed the 35 µg/L EPA health advisory level at a downstream drinking water supply raw water intake location. The purpose of the City of Greensboro's SOC is to reduce concentrations of 1,4-dioxane being discharged into the receiving stream in order to protect drinking water sources downstream of the T.Z. Osborne WWTP effluent discharge. This will be done by ensuring the drinking water standard of 35 µg/L is met at the point of the drinking water intakes.

How is DEQ addressing 1,4-dioxane discharges from the T.Z. Osborne WWTP?

DEQ is working with the City of Greensboro to address discharges of 1,4-dioxane from the T.Z. Osborne WWTP. One measure to accomplish this is through the SOC, which mandates reductions in the level of 1,4-dioxane in the receiving stream primarily through source reduction. Source reduction could include SIUs treating their wastewater before discharging it into the collection system. Additional measures will be taken by DEQ to address the North Carolina In-stream Target Value at the discharge location of the T.Z. Osborne WWTP as well as in all surface waters across the state.

One such mechanism to further reduce 1,4-dioxane concentrations in surface waters may be through National Pollutant Discharge Elimination System (NPDES) permits. Future NPDES permits for the T.Z. Osborne WWTP may include an effluent limit for 1,4-dioxane and/or special conditions that dictate actions the City of Greensboro may need to take in order to meet the allowable 1,4-dioxane In-stream Target Value at the point of discharge.