National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit to Discharge to Waters of the State of Ohio
for **Olentangy Environmental Control Center (OECC)**

Public Notice No.: 182922
Public Notice Date: April 28, 2023
Comment Period Ends: May 28, 2023

Ohio EPA Permit No.: **4PK00001*MD**
Application No.: **OH0054339**

Name and Address of Applicant:
Delaware County Board of Commissioners
Delaware County Courthouse
91 North Sandusky Street
Delaware, Ohio 43015

Name and Address of Facility Where Discharge Occurs:
Olentangy Environmental Control Center
10333 Olentangy River Road
Powell, OH 43065
Delaware County

Receiving Water: **Olentangy River**

Subsequent Stream Network: **Scioto River to Ohio River**

INTRODUCTION

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations (CFR), Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency (Ohio EPA), as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This Fact Sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act (CWA) and Ohio Water Pollution Control Law (Ohio Revised Code [ORC] 6111). Decisions to award variances to Water Quality Standards (WQS) or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

No antidegradation review was necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the CWA. Many of these have already been established by the United States Environmental Protection Agency (U.S. EPA) in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations (WLAs) are used to develop these limits based on the pollutants that have been detected in the discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based limits is determined by comparing the WLA for a pollutant to a measure of the effluent quality. The measure of effluent quality is called Projected Effluent Quality (PEQ). This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

SUMMARY OF PERMIT CONDITIONS

The effluent limits and monitoring requirements proposed for the following parameters are the same as in the previous permit: water temperature, dissolved oxygen, total suspended solids, oil and grease, ammonia, total Kjeldahl nitrogen, phosphorus, ortho-phosphate, nickel, zinc, cadmium, lead, chromium, copper, dissolved hexavalent chromium, E. coli, flow, mercury, pH, total filterable residue (dissolved solids), and 5-day carbonaceous biochemical oxygen demand.

New seasonal, final effluent limits (concentrations and loadings) are proposed for total inorganic nitrogen (TIN) (STORET 00640) to replace the final effluent limitations for nitrate + nitrate (STORET 00630) at the request of Delaware County. The nitrate + nitrite final effluent limitations were originally based on existing effluent quality from OECC discharge during the late 1990's and were not correlated to any denitrification design standards. Compliance with both seasonal ammonia-nitrogen (STORET 00610) and the existing nitrate + nitrate limitations proved challenging. Converting the nitrate + nitrate limits to equivalent TIN will allow for easier process control and plant operations, while not allowing for an increase in pollutant loadings.

Monitoring requirements are proposed to be removed for selenium (STORET 00981) since selenium has not been detected in the effluent during the last 5 years of DMR submissions nor in the last five (5) annual, pretreatment scans.

Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. This satisfies the minimum testing requirements of Ohio Administrative Code (OAC) 3754-33-07(B)(11) and will adequately characterize toxicity in the plant's effluent.

The permittee shall continue to use the approved low level methods for free cyanide testing: OIA-1677-09, ASTM D7237-10, and ASTM D4282-02. (Note: The use of ASTM D4282-02 requires supporting documentation that it meets the requirement of a "sufficiently sensitive" test procedure as defined in 40 CFR 122.44(i)(1)(iv)).

In Part II of the permit, special conditions are included that address sanitary sewer overflow (SSO) reporting; operator certification, minimum staffing, and operator of record; whole effluent toxicity (WET) testing; storm water compliance; pretreatment program requirements; supplemental effluent data; and outfall signage.

This permit renewal is proposed for a term of five years.

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PROCEDURES FOR PARTICIPATION IN THE FORMULATION OF FINAL DETERMINATIONS

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be emailed to HClerk@epa.ohio.gov or mailed to:

Legal Records Section
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted by email to epa.dswcomments@epa.ohio.gov (preferred method) or delivered in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

Ohio Environmental Protection Agency
Attention: Division of Surface Water
Permits Processing Unit
P.O. Box 1049
Columbus, Ohio 43216-1049

The Ohio EPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

Citizens may conduct file reviews regarding specific companies or sites. Appointments are necessary to conduct file reviews, because requests to review files have increased dramatically in recent years. The first 250 pages copied are free. For requests to copy more than 250 pages, there is a five-cent charge for each page copied. Payment is required by check or money order, made payable to Treasurer State of Ohio.

For additional information about this fact sheet or the draft permit, contact John Owen, (614) 728-3849, john.owen@epa.ohio.gov.

INFORMATION REGARDING CERTAIN WATER QUALITY BASED EFFLUENT LIMITS

This draft permit may contain proposed water-quality-based effluent limits (WQBELs) for parameters that **are not** priority pollutants. (See the following link for a list of the priority pollutants: https://epa.ohio.gov/static/Portals/35/pretreatment/Pretreatment_Program_Priority_Pollutant_Detection_Limits.pdf.) In accordance with ORC 6111.03(J)(3), the Director established these WQBELs after considering, to the extent consistent with the Federal Water Pollution Control Act, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to

accomplishment of the purposes of this chapter. This determination was made based on data and information available at the time the permit was drafted, which included the contents of the timely submitted NPDES permit renewal application, along with any and all pertinent information available to the Director.

This public notice allows the permittee to provide to the Director for consideration during this public comment period additional site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness for achieving compliance with the proposed final effluent limitations for these parameters. The permittee shall email to epa.dswcomments@epa.ohio.gov (preferred method) or deliver or mail this information to:

Ohio Environmental Protection Agency
Attention: Division of Surface Water
Permits Processing Unit
P.O. Box 1049
Columbus, Ohio 43216-1049

Should the applicant need additional time to review, obtain or develop site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness of achieving compliance with these limitations, a written request for any additional time shall be sent to the above address no later than 30 days after the Public Notice Date on Page 1.

Should the applicant determine that compliance with the proposed WQBELs for parameters other than the priority pollutants is technically and/or economically unattainable, the permittee may submit an application for a variance to the applicable WQS used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in OAC 3745-33-07(D). The permittee shall submit this application to the above address no later than 30 days after the Public Notice Date.

Alternately, the applicant may propose the development of site-specific WQS pursuant to OAC 3745-1-39. The permittee shall submit written notification regarding their intent to develop site specific WQS for parameters that are not priority pollutants to the above address no later than 30 days after the Public Notice Date.

LOCATION OF DISCHARGE/RECEIVING WATER USE CLASSIFICATION

The Olentangy Environmental Control Center (OECC) discharges to the Olentangy River at River Mile 13.4 in Delaware County. Figure 1 shows the approximate location of the facility.

This segment is further identified by Ohio EPA River Code: 02-400 and U.S. EPA River Reach Code: 05060001-11-02, County: Delaware. This section of the Olentangy River is in the Eastern Corn Belt Plains Ecoregion. The following designated uses under Ohio's WQS (OAC 3745-1-09) are applicable to this section of the Olentangy River: Exceptional Warmwater Habitat (EWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and primary contact recreation (PCR).

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric WQS are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal CWA. Ohio WQS also include aquatic life use designations for waterbodies which cannot meet the CWA goals because of human-caused conditions that cannot be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact Recreation) and wading only (Secondary Contact which are generally waters too shallow for swimming or canoeing).

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural water supply and industrial water supply.

FACILITY DESCRIPTION

The OECC is an advanced treatment facility with an average design flow of 6.0 million gallons per day (MGD). The treatment plant was originally constructed in 1980, with the most recent major upgrade occurring in 2009. The treatment plant serves the City of Powell, portions of Dublin, and Liberty, Orange, Berlin, and Concord Townships in Delaware County. Treatment plant processes and/or equipment include:

- Influent pumping;
- Bar screen;
- Comminution;
- Primary sedimentation;
- Activated sludge – conventional;
- Combined biological nitrification and BOD removal;
- Biological denitrification;
- Secondary clarification with ferric chloride addition;
- Mixed media filter;
- Ultraviolet disinfection; and
- Post-aeration.

On October 11, 2022, Permit to Install (PTI) No.: 1481990 was issued to Delaware County for the OECC Headworks and Aeration Upgrades project, for which construction is currently underway. The project was to make improvements to the Olentangy Environmental Control Center utilizing a Design-Build delivery method. The general improvements plan includes upsizing and renovation of the existing influent pump station, construction of a new influent screenings facility, replacement of the biological treatment equipment and conversion to 4/5-Stage Bardenpho biological nutrient removal process during dry weather for influent flows less than 13 to 18.5 MGD (depending on influent loadings. For wet weather influenced flows, improvements to the plant will allow for the transition into a contact stabilization-based mode of operation to retain mixed liquor within the treatment system. The wet weather "mode" will increase the process capacity to approximately 24 MGD of influent flow. Additionally, the project will allow for the conversion of the existing tertiary sand filters to cloth disk filters, and provide upgrades to the solids thickening, storage, and dewatering facilities. Once the final improvements have been completed, a closing PTI application will be submitted that will outline what final improvement were installed.

Currently OECC has a manual bypass that can re-route all or a portion of flow around both the tertiary filters and disinfection. In this alignment, all plant flow is bypassed around tertiary and disinfection treatments before flowing through post aeration and the sampling and monitoring stations, ultimately discharging via 001.

This bypass may only be used during filter and UV maintenance November through April, after notice is given to Ohio EPA and Ohio EPA has agreed to the bypass. This diversion is allowed, granted that effluent limits are met, that sampling for total suspended solids, ammonia-N, total phosphorus, E. coli and 5-day CBOD is done at Outfall 001 during the diversion and reported in eDMR. Bypassing disinfection is prohibited May through October, and if it occurs Delaware County Regional Sewer District shall follow the guidelines set forth in Part III 11.B. and III 12.B. of the permit. During bypass events, sampling shall be reported at station 602 as described in Part I of the permit.

Additionally, OECC automatically diverts a portion of flow around tertiary filters at set flow rates. Diverted flow is then combined with filtered flow, disinfected (May through October), and discharged to the Olentangy River through Outfall 001. The filter diversion is allowed to ensure efficient operation as long as effluent limits are met and that sampling at Outfall 001 for total suspended solids, ammonia-N, total phosphorus, E. coli, and 5-day CBOD is done and reported on the eDMR.

During bypass events, sampling is reported at station 602. A special condition is included in Part II and part III of the permit to describe bypass conditions.

OECC has an approved pretreatment program. OECC has two categorical users that discharge 0.070 MGD of flow.

For potable water, the OECC service area uses both surface water from the Olentangy River (Delco Water Company) and groundwater from private wells.

OECC has 100% separated sewers in the collection system which include 10 lift stations.

OECC currently utilizes the following sewage sludge treatment processes (Figure 3):

- Gravity Thickening
- Polymer, Lime, ferric-chloride, alum addition
- Mechanical Dewatering via centrifuge
- Landfilling
- Hauling to another facility for treatment

However, as discussed above, improvement to the sludge management are currently underway and will included improvements to the solids thickening, storage, and dewatering facilities.

Table 1 shows the last five years of sludge removed from OECC. Treated sludge is either disposed of in a municipal landfill or transferred to another NPDES permit holder.

DESCRIPTION OF EXISTING DISCHARGE

Table 2 presents the effluent violations for OECC during the period from 8/01/2017 to 2/1/2023. These violations were for ammonia-nitrogen and nitrate + nitrate. As discussed previously, Delaware County had received a PTI for WWTP improvements to better facilitate nutrient removal. The draft NPDES permit has also contains changes in final effluent limitation that will make compliance easier to achieve by substituting TIN for nitrate + nitrite.

Table 3 presents the average annual effluent flow rate for OECC for the period from 8/01/2017 to 2/1/2023. The NPDES renewal application estimates the current an infiltration/inflow (I/I) rate is approximately 0.300 MGD and that A CMOM plan has been implemented to help in the elimination of I&I.

Table 4 presents the number of SSOs reported by OECC for the period from 8/01/2017 to 2/1/2023. SSOs are reported at station 300. A total of six (6) of SSOs was reported on during this period. One each in 2018, 2019 and 2022 and three (3) reported in 2020.

Table 55 presents data characterizing the seasonal total phosphorus load from OECC during the the period from 8/01/2017 to 2/1/2023. OECC must maintain phosphorus loading limits as part of current NPDES permit and TMDL.

Table 5 presents chemical specific data compiled from data reported in annual pretreatment reports. Because this data is substantially identical to the application requirements in CFR 122.21(j), the Director has waived the requirement for submittal of supplemental effluent testing data as part of the NPDES renewal application.

Table 6 presents chemical specific data compiled from data collected by Ohio EPA.

Table 7 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period August 1, 2017, to January 2022, and current permit limits are provided for comparison.

Table 8 summarizes the chemical specific data for outfall 4PK00001001 by presenting the average and maximum PEQ values.

Table 9 summarizes the results of acute and chronic Whole Effluent Toxicity (WET) tests of the final effluent, using the water flea (*Ceriodaphnia dubia*) and fathead minnow (*Pimephales promelas*) as test organisms.

Table 10 summarizes the screening results of Ohio EPA bioassay sampling of the final effluent.

ASSESSMENT OF IMPACT ON RECEIVING WATERS

Pursuant to Section 303(d) of the Clean Water Act, each state is required to develop and submit a list to US EPA of its impaired and threatened waters (e.g. stream/river segments, lakes). For each water on the list, the state identifies the pollutant(s) causing the impairment, when known. The 050600011102 watershed assessment unit, which includes the Olentangy River in the vicinity of OECC, is listed as impaired for Recreation on Ohio's 303(d) list.

The Total Maximum Daily Load (TMDL) program focuses on identifying and restoring polluted rivers, streams, lakes and other surface water bodies. A TMDL is a written, quantitative assessment of water quality problems in a water body and contributing sources of pollution. It specifies the amount a pollutant needs to be reduced to meet water quality standards (WQS), allocates pollutant load reductions, and provides the basis for taking actions needed to restore a water body. A Total Daily Maximum Load (TMDL) report was approved for the Olentangy River in August, 2007.

An assessment of the impact of a permitted point source on the immediate receiving waters includes an evaluation of the available chemical/physical, biological, and habitat data which have been collected by Ohio EPA pursuant to the Five-Year Basin Approach for Monitoring and NPDES Reissuance. Other data may be used provided it was collected in accordance with Ohio EPA methods and protocols as specified by the Ohio WQS and Ohio EPA guidance documents. Other information which may be evaluated includes, but is not limited to: NPDES permittee self-monitoring data; effluent and mixing zone bioassays conducted by Ohio EPA, the permittee, or U.S. EPA.

In evaluating this data, Ohio EPA attempts to link environmental stresses and measured pollutant exposure to the health and diversity of biological communities. Stresses can include pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. Indicators of exposure to these stresses include whole effluent toxicity tests, fish tissue chemical data, and fish health biomarkers (for example, fish blood tests).

Use attainment is a term which describes the degree to which environmental indicators are either above or below criteria specified by the Ohio WQS (OAC 3745-1). Assessing use attainment status for aquatic life uses primarily relies on the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-1). These criteria apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on measuring several characteristics of the fish and macroinvertebrate communities; these characteristics are combined into multimetric biological indices including the Index of Biotic Integrity and modified Index of Well-Being, which indicate the response of the fish community, and the Invertebrate Community Index, which indicates the response of the macroinvertebrate community. Numerical criteria are broken down by ecoregion, use designation, and stream or river size. Ohio has five ecoregions defined by common topography, land use, potential vegetation and soil type.

Three attainment status results are possible at each sampling location -full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails meet the biocriteria. Nonattainment means that either none of the applicable indices meet the biocriteria or one of the organism groups indicates poor or very poor performance. An aquatic life use attainment table (see Table 11) is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (i.e., full, partial, or non), the Qualitative Habitat Evaluation Index, and comments and observations for each sampling location.

Failing home sewage treatment systems are the source of impairment for recreation in the Lower Olentangy Watershed where the OECC is located. According to the use attainment table (see Table 11), the Olentangy River is attaining the aquatic life use designation downstream of the discharge. By continuing to comply with the *e. Coli* and Phosphorus limits in their permit, the OECC will not be contributing to impairments in the Olentangy River. The 2007 TMDL report suggests connecting home treatments to existing sewer systems or upgrading them.

The full TMDL is available through the Ohio EPA, Division of Surface Water website at:

https://epa.ohio.gov/static/Portals/35/tmdl/OlentangyTMDL_final_aug07.pdf

DEVELOPMENT OF WATER-QUALITY-BASED EFFLUENT LIMITS

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

Parameter Selection

Effluent data for the OECC were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA, DMR data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR)	August 1, 2017, through February 1, 2023
Pretreatment data	2017-2022
NPDES renewal application data	2017-2023
Pretreatment data	2017-2022
Ohio EPA bioassay sampling data	March 2022

Statistical Outliers and Other Non-representative Data

The data were examined, and no values were removed from the evaluation.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points (See Table 8). See Modeling Guidance #1 for more information on PEQ calculations, available through the Ohio EPA, Division of Surface Water website at:

https://www.epa.ohio.gov/portals/35/guidance/model1.pdf

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required (see Table 12).

Wasteload Allocation

For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not break down in the receiving water. For free flowing streams, WLAs using this method are calculated using the following general equation: Discharger WLA = (downstream flow x WQS) - (upstream flow x background concentration). Discharger WLAs are divided by the discharge flow so that the allocations are expressed as concentrations.

The following dischargers in the Olentangy River were not considered interactive (see Figure 4): Due to the distance between the two facilities, they are not considered interactive.

- Upper Olentangy Water Reclamation Center (RM 25.3)
- Olentangy Environmental Control Center (RM 13.4)

The applicable waterbody uses for this facility's discharge and the associated stream design flows are as follows:

Aquatic life (Warmwater Habitat)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer 30Q10
		Winter 30Q10
Wildlife		Annual 90Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 13, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

The data used in the WLA are listed in Table 12 and Table 13. The WLA results to maintain all applicable criteria are presented in Table 14.

Whole Effluent Toxicity Wasteload Allocation

WET is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

WQS for WET are expressed in Ohio's narrative "free from" WQS rule [OAC 3745-1-04(D)]. These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). WLAs can then be calculated using TUs as if they were water quality criteria.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU_c) and 7Q10 flow for the average and the acute toxicity unit (TU_a) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For OECC, the WLA values are 0.8 TU_a and 2.68 TU_c.

$$\text{Stream Dilution Ratio} = \frac{\text{7Q10 + [WWTP flow rate]}}{\text{[WWTP flow rate]}} = \frac{\text{15.6 cfs + 11.15 cfs}}{\text{11.15 cfs}} = 2.40$$

The chronic toxicity unit (TU_c) is defined as 100 divided by the estimate of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms (IC_{25}):

$$TU_c = 100/IC_{25}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations except when the following equation is more restrictive (*Ceriodaphnia dubia* only):

TU_c = 100/geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration

The acute toxicity unit (TU_a) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life (LC_{50}) for the most sensitive test species:

$$TU_a = 100/LC_{50}$$

This equation applies outside the mixing zone for all designated waters.

When the acute WLA is less than 1.0 TU_a, it may be defined as:

Downstream Dilution Ratio (downstream flow to discharger flow)	Allowable Effluent Toxicity (percent effects in 100% effluent)
up to 2	30
greater than 2 but less than 2.7	40
2.7 to 3.3	50

$$\text{Downstream Dilution Ratio} = \frac{1Q10 + [\text{WWTP flow rate}]}{[\text{WWTP flow rate}]} = \frac{15.6 \text{ cfs} + 11.15 \text{ cfs}}{11.15 \text{ cfs}} = 2.40$$

The acute WLA for OECC is 40 percent mortality in 100 percent effluent based on the dilution ratio of 2.4 to 1.

REASONABLE POTENTIAL/EFFLUENT LIMITS/MANAGEMENT DECISIONS

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 14. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 8, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 15.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 16 presents the final effluent limits and monitoring requirements proposed for OECC outfall 001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Total Suspended Solids, Ammonia, CBOD5, and Dissolved Oxygen

The limits proposed for dissolved oxygen, total suspended solids, ammonia and 5-day carbonaceous biochemical oxygen demand (CBOD5) are all based on plant design criteria. The TSS and CBOD5 limits are more stringent than the Secondary Treatment Standards in 40 CFR Part 133. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity. The current dissolved oxygen limit is protective of WQS.

Phosphorus and Total Inorganic Nitrogen

Based on best technical judgment (BTJ), limits for are proposed to continue for Phosphorus and new limits for Total Inorganic Nitrogen. According to the use attainment table (Table 11), the Olentangy River is attaining the aquatic life use designation downstream of the discharge. Thirty-day average concentration and loading limits are proposed for these parameters.

Oil and grease, pH, and Escherichia coli

Limits proposed for oil and grease, pH, and *Escherichia coli* are based on WQS (OAC 3745-1-35 and 37). Primary contact recreation *E. coli* standards apply to the Olentangy River.

Bis(2-ethylhexyl) phthalate

The Ohio EPA risk assessment (Table 15) places Bis(2-ethylhexyl) phthalate in group 5. This placement, as well as the data in Table 7 and Table 8, indicates that the reasonable potential to exceed WQS exists, and limits are necessary to protect water quality. For this parameter, the PEQ is between 75 and 100 percent of the WLA and certain conditions exist that increase the risk to the environment. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). The thirty-day average concentration and loading, daily maximum concentration and loading limit for Bis(2-ethylhexyl) phthalate is based on aquatic life standards.

Copper

The Ohio EPA risk assessment (Table 15) places Copper in group 4. This placement, as well as the data in Table 7 and Table 8, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC 3745-33-07(A)(2). Monitoring will continue at the same frequency.

Cyanide, Nickel, Zinc, Selenium, Lead, Chromium, Chromium Hexavalent, Cadmium, and Mercury

The Ohio EPA risk assessment (Table 15) places Cyanide, Nickel, Zinc, Selenium, Lead, Chromium, Chromium Hexavalent, Cadmium, and Mercury in groups 2 and 3. This placement, as well as the data in Table 7 and Table 8, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring is proposed to document that these pollutants continue to remain at low levels

Chloroform, Molybdenum, and Antimony

The Ohio EPA risk assessment (Table 15) places Chloroform, Molybdenum, and Antimony in groups 2 and 3. This placement, as well as the data in Table 7 and Table 8, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. No new monitoring is proposed.

Water Temperature, Total Kjeldahl Nitrogen, Nitrate+Nitrite and Flow Rate

Monitoring for Water Temperature, Total Kjeldahl Nitrogen, Nitrate+Nitrite and Flow Rate is proposed to continue in order to evaluate the performance of the treatment plant.

Dissolved Orthophosphate

Monitoring for dissolved orthophosphate (as P) is required by ORC 6111.03. This monitoring will further develop nutrient datasets that are used in stream and watershed assessments and studies. Because Ohio EPA monitoring, as well as other in-stream monitoring, for dissolved orthophosphate is taken by grab sample, grab samples are proposed for orthophosphate to maintain consistent data. The grab samples must be filtered within 15 minutes of collection using a 0.45-micron filter. The filtered sample must be analyzed within 48 hours.

Whole Effluent Toxicity Reasonable Potential

Based on evaluating the WET data presented in Table 9, Table 10, Attachment 1, and other pertinent data under the provisions of OAC 3745-33-07(B), the OECC is placed in Category 3 with respect to WET. No limits are proposed, but increased quarterly Chronic testing is proposed for *Pimephales Promelas and Ceriodaphnia Dubia* for the duration of 24 months.

Additional Monitoring Requirements

Monitoring for Selenium is proposed to be removed at influent monitoring station 001 based on the Wasteload Allocation showing no detections during the previous permit.

Total Inorganic Nitrogen is proposed to be added to the influent monitoring stations during the summer and winter months to better reflect the facilities performance. Monthly Total Kjeldahl Nitrogen is proposed to be added to the influent station to further categorize the nitrogen load coming into the plant.

Additional monitoring requirements proposed at the final effluent, influent and upstream/downstream stations are included for all facilities in Ohio and vary according to the type and size of the discharge. In addition to permit compliance, this data is used to assist in the evaluation of effluent quality and treatment plant performance and for designing plant improvements and conducting future stream studies.

Sludge
Limits and monitoring requirements proposed for the disposal of sewage sludge by the following management practices are based on OAC 3745-40: land application, removal to sanitary landfill or transfer to another facility with an NPDES permit.

OTHER REQUIREMENTS

Compliance Schedule

New Limit(s) - A 24-month compliance schedule is proposed for the OECC to meet the new daily/monthly maximum/load limits for Bis(2-ethyhexyl) Pthalate. In the interim, the facility will continue monthly montioring. Details are in Part I.C of the permit.

Sanitary Sewer Overflow Reporting
Provisions for reporting SSOs are again proposed in this permit. These provisions include: the reporting of the system-wide number of SSO occurrences on monthly operating reports; telephone notification of Ohio EPA and the local health department, and 5-day follow up written reports for certain high risk SSOs; and preparation of an annual report that is submitted to Ohio EPA and made available to the public. Many of these provisions were already required under the "Noncompliance Notification", "Records Retention", and "Facility Operation and Quality Control" general conditions in Part III of Ohio NPDES permits.

Operator Certification and Operator of Record

Operator certification requirements have been included in Part II of the permit in accordance with rules effective on August 15, 2018 (OAC 3745-7). These rules require the OECC to have a Class IV wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001. These rules also require the permittee to designate one or more operator of record to oversee the technical operation of the treatment works and sewerage system.

Low-Level Free Cyanide Testing
Currently there are three approved methods for free cyanide listed in 40 CFR 136 that have a quantification level lower than water quality-based effluent limits:

- ASTM D7237-10, OIA-1677-09, and ASTM D4282-02. (Note: The use of ASTM D4282-02 requires supporting documentation that it meets the requirement of a "sufficiently sensitive" test procedure as defined in 40 CFR 122.44(i)(1)(iv)).

These methods will allow Ohio EPA to make more reliable water quality-related decisions regarding free cyanide. Because the quantification levels are lower than any water quality-based effluent limits, it will also be possible to directly evaluate compliance with free cyanide limits.

Outfall Signage
Part II of the permit includes requirements for the permittee to place and maintain a sign at each outfall to the Olentangy River providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

Part III
Part III of the permit details standard conditions that include monitoring, reporting requirements, compliance responsibilities, and general requirements.

Storm Water Compliance

Parts IV, V, and VI have been included with the draft permit to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the OECC may seek permit coverage under the general permit for industrial storm water (permit # OHR000006) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the OECC submits a Notice of Intent (NOI) for coverage under the general permit for industrial storm water or submits a No Exposure Certification, 2) Ohio EPA determines that the facility is eligible for coverage under the general permit or meets the requirements for a No Exposure Certification, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

Figure 1. Location of the Olentangy Environmental Control Center

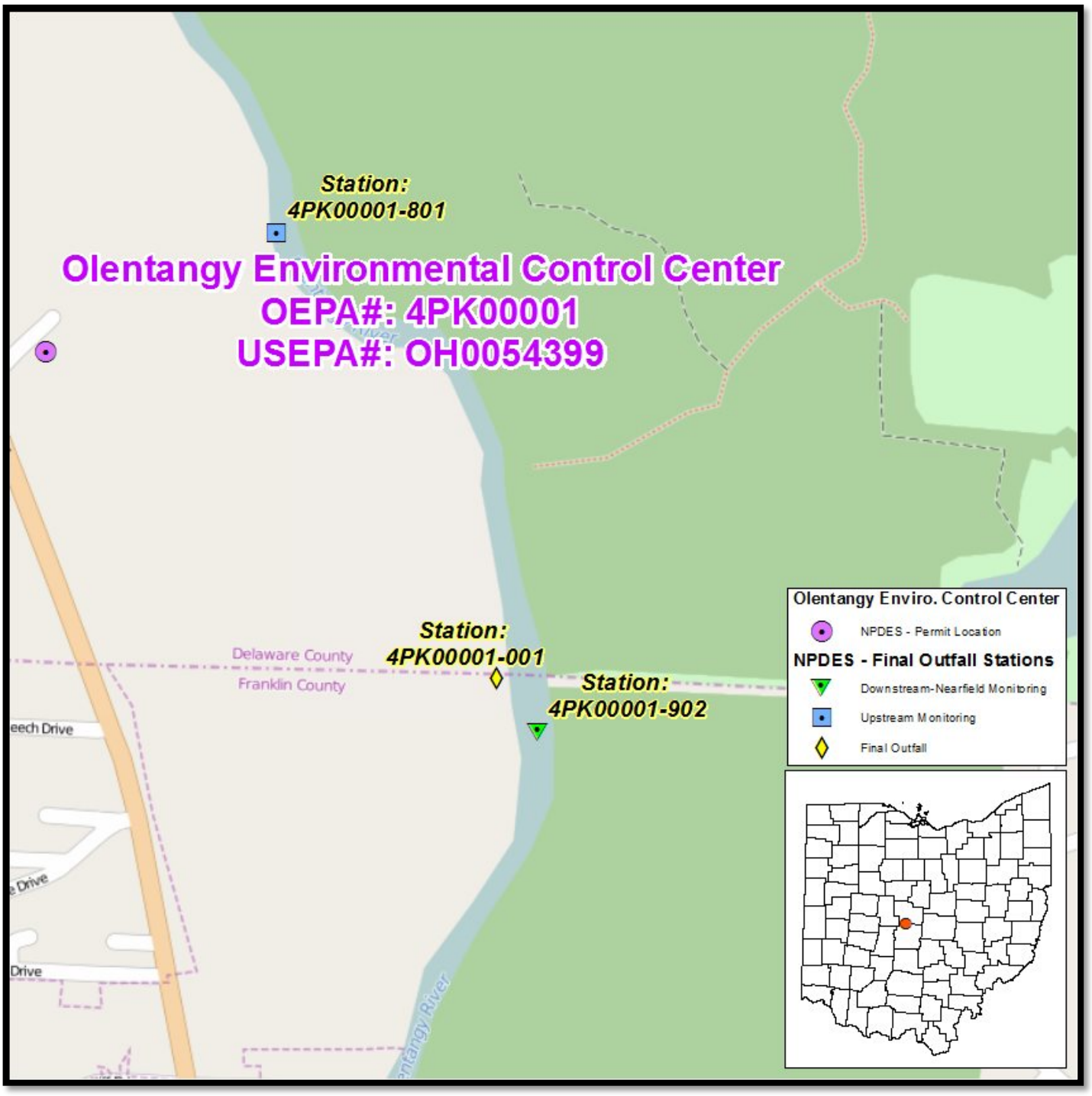

Figure 2. Diagram of Wastewater Treatment System

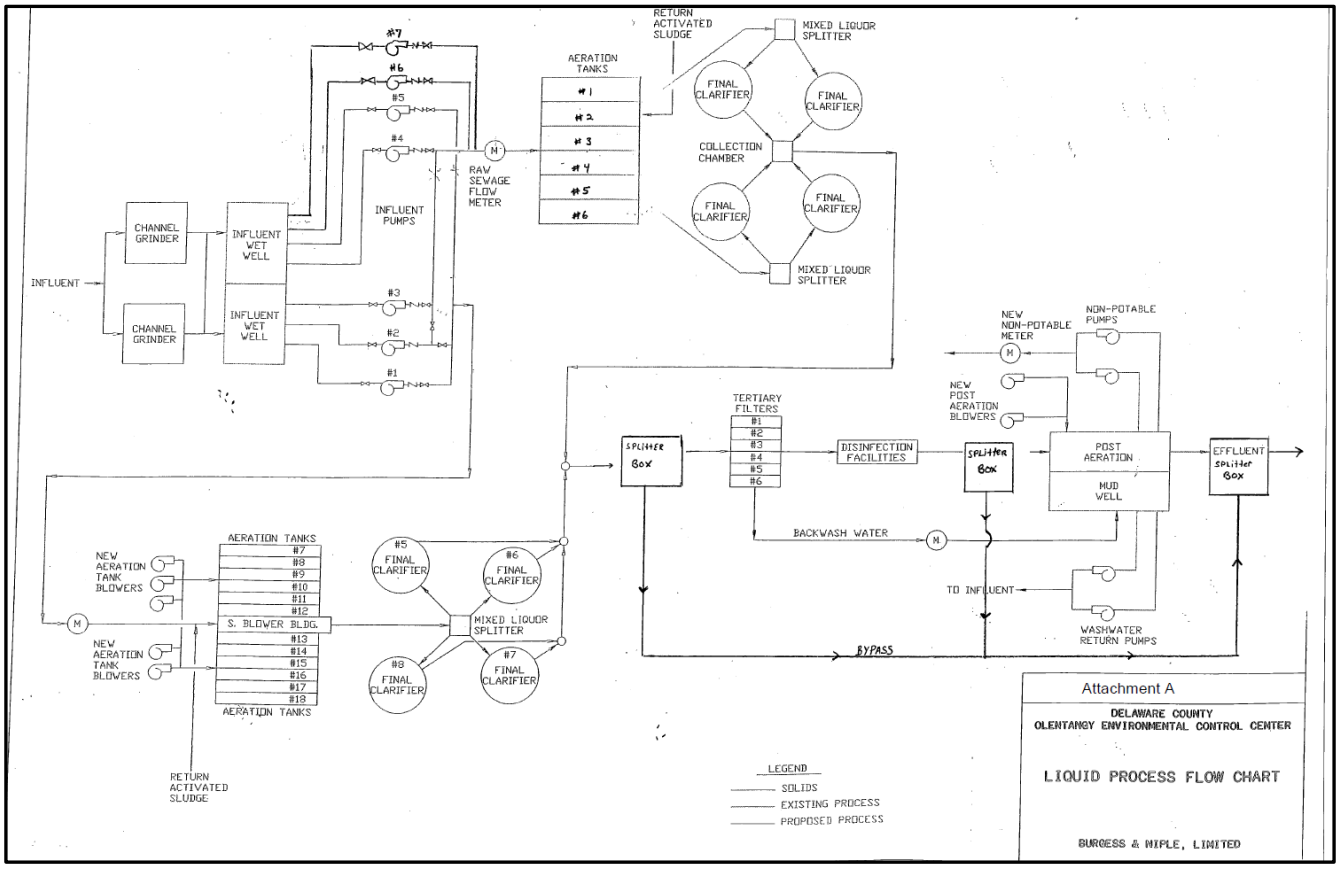

Figure 3. Diagram of Sludge Treatment System

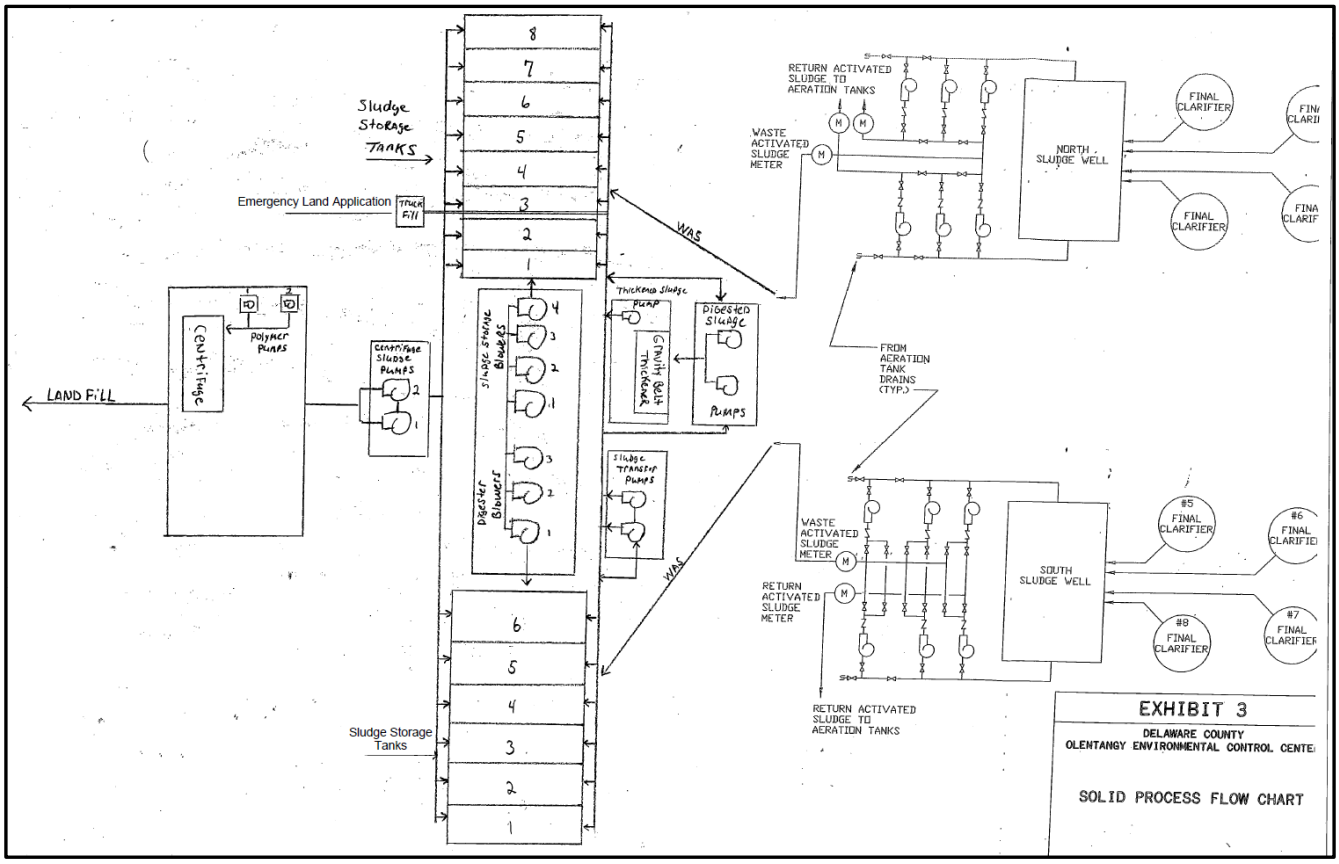

Figure 4. Olentangy River Study Area

The Olentangy Environmental Control Center (OECC) discharges to the Olentangy River approximately 12 miles downstream of the Upper Olentangy Water Reclamation Center. Due to the distance between these two discharges, they are not considered to be interactive.

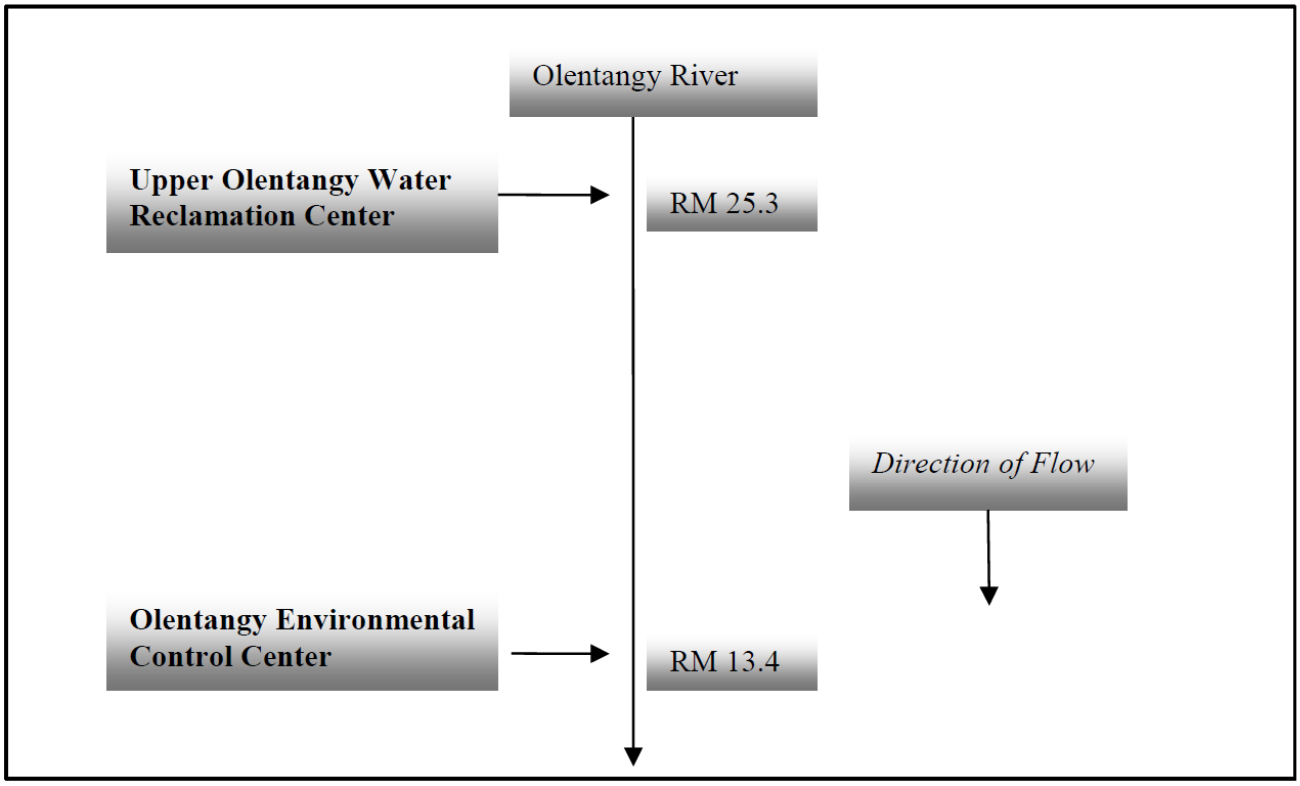

Table 1. Sewage Sludge Removal from August 1, 2017, to February 1, 2023

Year	Dry Tons Removed	
	Code 51129	Code 70316
2017	709	- - -
2018	730	- - -
2019	848	- - -
2020	148	609
2021	896	- - -- - -
2022	957	

Table 2. Effluent Violations for Outfall 001 between August 1, 2017, to February 1, 2023

PARAMETER	2017*	2018	2019	2020	2021	2022	2023
Nitrite Plus Nitrate,	0	0	1	0	1	1	0
Nitrogen, Ammonia (NH_3)	0	0	1	3	3	1	0
Total	0	0	2	3	4	2	0

* 2017 is a partial year beginning on August 1.

Table 3. Average Annual Effluent Flow Rates at Outfall 4PK00001001 between 8/1/2017 and 2/01/2023.

Flow Rate (Million Gallons per Day)					
Year	# obs.	Average	Median	95th Percentile	Maximum
2017*	153	3.12	2.89	4.65	9.87
2018	365	3.94	3.48	6.76	11.81
2019	365	3.78	3.43	5.77	9.62
2020	366	4.23	3.86	6.6	16.71
2021	365	4.01	3.72	6.09	8.69
2022	365	4.12	3.72	6.91	11.44
2023	31	5.11	5.33	7.01	7.11

MGD = million gallons per day.

* 2017 is a partial year beginning on August 1. 2023 is a partial year ending on February 1, 2023.

Table 4. Sanitary Sewer Overflows Discharges between 8/1/2017 and 2/01/2023.

Year	Number of SSOs
2017*	0
2018	1
2019	1
2020	3
2021	0
2022	1
2023	0

* 2017 is a partial year beginning on August 1. 2023 is a partial year ending on February 1, 2023

Table 5. Calculated Seasonal Total Phosphorus Loadings for 4PK00001 between 8/01/2017 to 2/01/2023.

For Months May - October				
Year	Obs. (n)	Median Phosphorus (mg/L)	Median Flow (MGD)	Median Loading (kg/day)
2017[a]	10	0.11	2.78	1.20
2018	27	0.22	3.33	2.88
2019	19	0.16	3.24	2.18
2020	23	0.15	3.71	2.25
2021	23	0.14	3.80	2.34
2022	24	0.16	3.64	2.50

[a] = data set begins on 8/1/17
MGD = million gallons per day
n = number of samples

Table 5. Effluent Characterization Using Pretreatment Data

Parameter	Units	3/01/2017	3/08/2018	3/13/2019	07/29/2020	06/09/2021	03/29/2022
Antimony	µg/L	AA (5)	AA (5)	AA (5)	AA (5)	1	0.9
Arsenic	µg/L	AA (5)	AA (5)	AA (5)	AA (5)	AA (0.3)	AA (0.3)
Beryllium	µg/L	AA (3)	AA (3)	AA (3)	AA (3)	AA (0.1)	AA (0.1)
Cadmium	µg/L	AA (3)	AA (3)	AA (3)	AA (3)	AA (0.1)	AA (0.1)
Chromium	µg/L	AA (7)	8	AA (7)	AA (7)	1.7	1.9
Copper	µg/L	AA (8)	AA (8)	AA (8)	AA (8)	2.3	2.5
Lead	µg/L	AA (10)	AA (10)	AA (10)	AA (10)	AA (0.2)	AA (0.2)
Mercury	µg/L	AA (0.0005)	0.0013	AA (0.2)	AA (0.0005)	0.0003	AA (0.0002)
Molybdenum	µg/L	AA (20)	AA (20)	AA (20)	AA (20)	26	28
Nickel	µg/L	17	AA (8)	AA (8)	AA (8)	5.8	4.9
Selenium	µg/L	AA (4)	AA (4)	AA (4)	AA (4)	AA (0.2)	AA (0.2)
Silver	µg/L	AA (5)	AA (5)	AA (5)	AA (5)	AA (0.4)	AA (0.4)
Thallium	µg/L	AA (5)	AA (5)	AA (5)	AA (5)	AA (0.1)	AA (0.1)
Zinc	µg/L	33	39	48	48	39	34
Cyanide, Total	µg/L	13	AA (10)	AA (10)	AA (10)	AA (8.3)	AA (7)
Chloroform	µg/L	AA (5)	AA (5)	AA (5)	AA (5)	0.8	0.6
Bis(2EH)Phthalate	µg/L	AA (5)	AA (5)	AA (5)	AA (5)	AA (1.83)	3.6

AA = not-detected (analytical method detection limit)

Table 6. Effluent Characterization Using Ohio EPA data

Parameter	Units	3/16/2022
Antimony	µg/L	AA (2)
Arsenic	µg/L	AA (2)
Beryllium	µg/L	AA (0.2)
Cadmium	µg/L	AA (0.2)
Chromium	µg/L	AA (2.0)
Copper	µg/L	2.25
Lead	µg/L	AA (2.0)
Mercury	ng/L	AA (0.2)
Nickel	µg/L	AA (20)
Selenium	µg/L	AA (2.0)
Silver	µg/L	AA (0.2)
Strontium	µg/L	664
Thallium	µg/L	AA (2.0)
Total Filterable Residue	mg/L	644
Zinc	µg/L	38.5
Ammonia-Nitrogen	mg/L	0.206
Chloroform	µg/L	0.565
Bis(2EH)Phthalate	µg/L	AA (10.4)

*Data Found During a Bioassay Sampling from the Ohio EPA
AA = not detected (analytical method detection limit)

Table 7. Effluent Characterization Using Self-Monitoring Data

Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
		30 Day	Daily		50th	95th	
Water Temperature	°C	Monitoring Only		2010	17	21.6	11 - 23
Dissolved Oxygen	mg/L	--	5.0[m]	2010	6.9	5.5*	5 - 9.7
Total Suspended Solids	kg/day	273	409[w]	830	13.1	39.7	0 - 197
Total Suspended Solids	mg/L	12	18[w]	830	1	2.06	0 - 8
Oil and Grease	mg/L	--	10	132	< 5	< 5	0 - 5.1
Nitrogen, Ammonia - Summer	kg/day	17.7	26.8[w]	437	1.82	22.7	0 - 45.7
Nitrogen, Ammonia - Summer	mg/L	0.78	1.18[w]	437	.14	1.44	0 - 3.35
Nitrogen, Ammonia - Winter	kg/day	29.1	43.8w	468	3.03	28.1	0 - 82.6
Nitrogen, Ammonia - Winter	mg/L	1.28	1.93[w]	468	.2	1.86	0 - 5
Nitrogen Kjeldahl, Total	mg/L	Monitoring Only		66	1.11	2.74	0 - 4.46
Nitrite Plus Nitrate, Total	kg/day	104	--	82	54.6	90.1	24.4 - 123
Nitrite Plus Nitrate, Total	mg/L	4.58	--	82	4.05	5.23	2.41 - 5.56
Phosphorus, Total	kg/day	22.8	--	320	2.5	12.1	0 - 20
Phosphorus, Total	mg/L	1.0	--	320	.16	.672	0 - 1.06
Orthophosphate, Dissolved	mg/L	Monitoring Only		66	.115	.565	0 - 1.05
Selenium, TR	µg/L	Monitoring Only		23	--	--	< 5
Nickel, TR	µg/L	Monitoring Only		23	< 10	< 10	0 - 97
Zinc, TR	µg/L	Monitoring Only		23	39	88.2	29 - 130
Cadmium, TR	µg/L	Monitoring Only		23	--	--	< .5
Lead, TR	µg/L	Monitoring Only		23	< 2	3.23	0 - 3.27
Chromium, TR	µg/L	Monitoring Only		23	--	--	< 10
Copper, TR	µg/L	Monitoring Only		66	< 10	< 10	0 - 38
Chromium, Diss. Hexavalent	µg/L	Monitoring Only		22	--	--	< 4
E. coli	#/100 mL	126	284[w]	406	2	30.3	0 - 328
Bis(2-ethylhexyl) Phthalate	µg/L	Monitoring Only		66	< 5	< 5	0 - 29.8
Flow Rate	MGD	Monitoring Only		2010	3.6	6.41	1.76 - 16.7
Mercury, Total	ng/L	Monitoring Only		22	< .5	.654	0 - .748
Cyanide, Free (Low-Level)	µg/L	Monitoring Only		22	--	--	< .005
Acute Tox., Ceriodaphnia dubia	TUa	Monitoring Only		6	--	--	< .2
Chronic Tox., Ceriodaphnia dubia	TUc	Monitoring Only		6	< 1	.825	0 - 1.1
Acute Tox., Pimephales promelas	TUa	Monitoring Only		6	--	--	< .2
Chronic Tox., Pimephales promelas	TUc	Monitoring Only		6	< 1	3.75	0 - 5
pH, Maximum	S.U.	--	9.0	2010	7.1	7.4	6.7 - 7.9
pH, Minimum	S.U.	--	6.5[m]	2010	7.1	6.9*	6.5 - 7.6
Residue, Total Filterable	mg/L	Monitoring Only		66	528	628	425 - 713
CBOD 5 day	kg/day	193	291[w]	830	< 23.2	50.2	0 - 158
CBOD 5 day	mg/L	8.5	12.8[w]	830	< 2	2.7	0 - 6.2

Table 8. Projected Effluent Quality for Outfall 001

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Ammonia-S	mg/L	288	166	0.728	1.46
Ammonia-W	mg/L	239	155	1.32	2.74
Antimony	µg/L	7	2	1.46	2
Bis(2-ethylhexyl)phthalate	µg/L	71	3	21.754	29.8
Cadmium - TR	µg/L	23	0	--	--
Chloroform (Trichloromethane)	µg/L	6	2	1.2264	1.68
Chromium - TR	µg/L	23	0	--	--
Chromium VI - Diss	µg/L	22	0	--	--
Copper - TR	µg/L	65	2	27.74	38
Cyanide - free (wwh,ewh,mwh)	µg/L	27	1	11.388	15.6
Dissolved solids (ave)	mg/L	65	65	580.3	637.4
Lead - TR	µg/L	23	10	2.85	3.87
Mercury - TR (BCC)	ng/L	22	3	0.709852	0.9724
Molybdenum	µg/L	6	2	42.924	58.8
Nickel - TR	µg/L	23	1	92.053	126.1
Selenium - TR	µg/L	23	0	--	--
Zinc - TR	µg/L	23	23	67.2	93

MDL = analytical method detection limit
PEQ = projected effluent quality
* Per OAC 3745-2-04(E)(3), ammonia PEQ is based on data collected during the following months:
Summer – June through September
Winter – December through February

Table 9. Summary of Acute and Chronic Toxicity Results

	Ceriodaphnia Dubia		*Pimephales Promelas*	
Date	**Acute (Tu_a)**	**Chronic (Tu_c)**	**Acute (Tu_a)**	**Chronic (Tu_c)**
8/1/2017	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
8/1/2018	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
8/5/2019	AA (0.2)	AA (1.0)	AA (0.2)	5
8/3/2020	AA (0.2)	AA (1.0)	AA (2.0)	AA (1.0)
8/8/2021	AA (0.2)	1.1	AA (0.2)	AA (1.0)
8/14/2022	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)

AA = non-detection; analytical method detection limit of 0.2 TU_a, 1.0 TU_c
TU_a = acute toxicity unit
TU_c = chronic toxicity unit

Table 10. Ohio EPA Toxicity Screening Results for Outfall 001

Date	**Acutely Toxic (Y/N)**	***Pimephales promelas*** **%M**	***Ceriodaphnia dubia*** **%M**
3/16/2022	N	0	0

%M = percent mortality in 100% effluent
*OEPA Tested Acute toxicity, but not chronic on this date.

Table 11. Use Attainment Table

Location	**RM**	**Use**	**Status**	**Cause**	**Source**
Olentangy R. adj. Hudson Rd.	27.5	WWH	Full		
Olentangy R. @ Olentangy Ave.; dst Up. Olentangy WRC discharge	24.5	WWH	Full		
Olentangy R. @ Hyatts Rd	19.4	EWH	Partial	Nutrient Enrichment, Siltation*	Urbanization*
Olentangy R. @ Powell Rd.	15	EWH	Full		
Olentangy R. dst OECC discharge	12.4	EWH	Full		
Olentangy R. dst. Bill Moose Trib.	7.8	WWH	Full		
Olentangy R. @ Dodridge Ave.	3.9	WWH	Full		

Data gathered from *Total Maximum Daily Loads for the Olentangy River Watershed, 2007*
* Pg. 69, *Total Maximum Daily Loads for the Olentangy River Watershed, 2007*
Rd = road
RM = River mile
WWH = warmwater habitat

Table 12. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Ammonia (Summer)	mg/L	--	--	0.7	--	--
Ammonia (Winter)	mg/L	--	--	1.7	--	--
Antimony	µg/L	4300	--	190	900	1800
Bis(2-ethylhexyl)phthalate	µg/L	59[c]	--	8.4	1100	2100
Cadmium - TR	µg/L	--	50	4.9	12	24
Chloroform (Trichloromethane)	µg/L	4700[c]	--	140	1300	2600
Chromium - TR	µg/L	--	100	180	3700	7400
Hexavalent Chromium (Dissolved)	µg/L	--	--	11	16	31
Copper - TR	µg/L	1300	500	20	32	64
Cyanide, Free	µg/L	22000	--	12	46	92
Dissolved Solids	mg/L	--	--	1500	--	--
Lead - TR	µg/L	--	100	20	370	750
Mercury	ng/L	12	10000	910	1700	3400
Molybdenum	µg/L	--	--	20000	190000	370000
Nickel - TR	µg/L	4600	200	110	980	2000
Selenium - TR	µg/L	11000	50	5	62	120
Zinc - TR	µg/L	69000	25000	250	250	500

[c] = carcinogen

Table 13. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Stream Flows				
1Q10	cfs	annual	15	USGS gage #03225500; 1979-2009 data
7Q10	cfs	annual	15.6	USGS gage #03225500; 1979-2009 data
		summer	0	
		winter	0	
30Q10	cfs	summer	18.4	USGS gage #03225500; 1979-2009 data
		winter	24.4	USGS gage #03225500; 1979-2009 data
90Q10	cfs	annual	0	
Harmonic Mean	cfs	annual	60.9	USGS gage #03225500; 1979-2009 data
Mixing Assumption	%	average	100	
		maximum	100	
Hardness, OMZ	mg/L	annual	240	4PK1901; 2017-22; n=65; 0<MDL
Hardness, IMZ	mg/L	annual	240	4PK1901; 2017-22; n=65; 0<MDL
pH	S.U.	summer	8.2	4PK1901; 2017-22; n=22; 0<MDL
		winter	8.35	4PK1901; 2017-22; n=15; 0<MDL
Temperature	ºC	summer	22.675	4PK1901; 2017-22; n=22; 0<MDL
		winter	4.2	4PK1901; 2017-22; n=15; 0<MDL
DCRSD-OECC flow	cfs	annual	9.2834	2022 NPDES Renewal App - DESIGN
Background Water Quality				
Ammonia (Summer)	mg/L		0	4PK1801; 2017-22; n=21; 20<MDL;
Ammonia (Winter)	mg/L		0	4PK1801; 2017-22; n=15; 10<MDL;
Antimony	µg/L		0	No representative data available.
Bis(2-ethylhexyl)phthalate	µg/L		0	No representative data available.
Cadmium - TR	µg/L		0	STORET; 1999-03; n=18; 18<MDL;
Chloroform (Trichloromethane)	µg/L		0	No representative data available.
Chromium - TR	µg/L		0	STORET; 1999-03; n=18; 18<MDL;
Hexavalent Chromium (Dissolved)	µg/L		0	No representative data available.
Copper - TR	µg/L		0	STORET; 1999-03; n=18; 18<MDL;
Cyanide, Free	µg/L		0	No representative data available.
Dissolved Solids	mg/L		338	STORET; 1999-03; n=18; 0<MDL;
Lead - TR	µg/L		1	STORET; 1999-03; n=18; 14<MDL;
Mercury	ng/L		0	No representative data available.
Molybdenum	µg/L		0	No representative data available.
Nickel - TR	µg/L		0	STORET; 1999-03; n=18; 18<MDL;
Selenium - TR	µg/L		0	STORET; 1999-03; n=18; 0<MDL;
Zinc - TR	µg/L		12.5	STORET; 1999-03; n=18; 6<MDL;

Table 14. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Ammonia (Summer)	mg/L	--	--	2.09	--	--
Ammonia (Winter)	mg/L	--	--	6.17	--	--
Antimony	µg/L	32508	--	509	2354	1800
Bis(2-ethylhexyl)phthalate	µg/L	446	--	23	2877	2100
Cadmium - TR	µg/L	--	378	13	31	24
Chloroform (Trichloromethane)	µg/L	35532	--	375	3401	2600
Chromium - TR	µg/L	--	756	482	9678	7400
Hexavalent Chromium (Dissolved)	µg/L	--	--	29	42	31
Copper - TR	µg/L	9828	3780	54	84	64
Cyanide, Free	µg/L	166322	--	32	120	92
Dissolved Solids	mg/L	--	--	3453	--	--
Lead - TR	µg/L	--	749	52	966	750
Mercury	ng/L	12	10000	910	1700	3400
Molybdenum	µg/L	--	--	53608	497000	370000
Nickel - TR	µg/L	34776	1512	295	2563	2000
Selenium - TR	µg/L	83161	378	13	162	120
Zinc - TR	µg/L	521565	188920	649	634	500

Table 15. Parameter Assessment

Group 1: Due to a lack of criteria, the following parameters could not be evaluated at this time.

No Parameters were placed into this category

Group 2: PEQ < 25 percent of WQS or all data below minimum detection limit.
WLA not required. No limit recommended; monitoring optional.

Antimony	Cadmium - TR	Chloroform (Trichloromethane)
Chromium - TR	Hexavalent Chromium (Dissolved)	Lead - TR
Mercury	Molybdenum	Selenium - TR

Group 3: PEQmax < 50 percent of maximum PEL and PEQavg < 50 percent of average PEL.
No limit recommended; monitoring optional.

Cyanide, Free	Dissolved Solids	Nickel - TR
Zinc - TR		

Group 4: PEQmax >= 50 percent, but < 100 percent of the maximum PEL or
PEQavg >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

Copper - TR

Group 5: Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

		Recommended Effluent Limits	
Parameter	*Units*	*Average*	*Maximum*
Bis(2-ethylhexyl)phthalate	µg/L	23	2100

Bis(2-ethylhexyl)phthalate becomes a Group 5 parameter based upon the loading test [OAC 3745-2-06(B)].

PEL = preliminary effluent limit
PEQ = projected effluent quality
WLA = wasteload allocation
WQS = water quality standard

PEL = preliminary effluent limit
PEQ = projected effluent quality
WLA = wasteload allocation
WQS = water quality standard

Table 16. Final Effluent Limits for Outfall 001

Parameter	Units	Concentration		Loading (kg/day)[a]		Basis[b]
		Daily Maximum	30 Day Average	Daily Maximum	30 Day Average	
Water Temperature	°C	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Dissolved Oxygen	mg/L	5.0[m]	--	--	--	WQS
TSS	mg/L	18[d]	12	409[d]	273	PD
Oil & Grease	mg/L	10	--	--	--	WQS
Ammonia (winter)	mg/L	1.93[d]	1.28	43.8[d]	29.1	PD
Ammonia (summer)	mg/L	1.18[d]	0.78	26.8[d]	17.7	PD
Total Kjeldahl Nitrogen	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				BTJ
Nitrate plus Nitrite	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M
Nitrogen, T. Inorg. (summer)	mg/L	--	5.36	--	121.7	TMDL/BEJ
Nitrogen, T. Inorg. (winter)	mg/l	--	5.86	--	133.1	TMDL/BEJ
Phosphorus	mg/L	--	1.0	--	22.8	TMDL/BEJ
Orthophosphate	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				PMR
Nickel	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Zinc	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Cadmium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Lead	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Chromium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Copper	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				RP
Dissolved Hexavalent Chromium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
E. coli	#/100 mL	284[d]	126	--	--	WQS
Bis(2-ethylhexyl) Phthalate	µg/L	23	2100	48	0.52	WLA
Flow Rate	MGD	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Mercury	ng/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Free Cyanide	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Acute Toxicity, *Ceriodaphnia dubia*	TUa	- - - - - - - - - - - Monitor - - - - - - - - - - - -				WET
Chronic Toxicity, *Ceriodaphnia dubia*	TUc	- - - - - - - - - - - Monitor - - - - - - - - - - - -				WET
Acute Toxicity, *Pimephales promelas*	TUa	- - - - - - - - - - - Monitor - - - - - - - - - - - -				WET
Chronic Toxicity, *Pimephales promelas*	TUc	- - - - - - - - - - - Monitor - - - - - - - - - - - -				WET
pH, maximum	SU	9.0	--	--	--	WQS
pH, minimum	SU	6.5[m]	--	--	--	WQS
Total Filterable Residue	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
CBOD5 (summer)	mg/L	12.8[d]	8.5	291[d]	193	PD

[a] Effluent loadings based on average design discharge flow of 6.0 MGD.

[b] Definitions:

ABS = Antibacksliding Rule (OAC 3745-33-05(F) and 40 CFR Part 122.44(l))
BADCT = Best Available Demonstrated Control Technology, 40 CFR Part 122.29, and OAC 3745-1-05
BEJ = Best Engineering Judgement
BPJ = Best Professional Judgment
BPT = Best Practicable Waste Treatment Technology, 40 CFR Part 133, Secondary Treatment Regulation
BTJ = Best Technical Judgment
CFR = Code of Federal Regulations
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
NPDES = National Pollutant Discharge Elimination System
OAC = Ohio Administrative Code
PD = Plant Design (OAC 3745-33-05(E))
PMR = Phosphorus monitoring requirements (ORC 6111.03)
PTS = Phosphorus Treatment Standards (OAC 3745-33-06 (C))
RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in permits (OAC 3745-33-07(A))
TMDL = Total Maximum Daily Load
VAR = Mercury variance (OAC 3745-1-38(J))
WET = Minimum testing requirements for whole effluent toxicity [OAC 3745-33-07(B)(11)] OR Reasonable potential for requiring water quality-based effluent limits and monitoring requirements for whole effluent toxicity in NPDES permits [OAC 3745-33-07(B)]
WLA = Wasteload Allocation procedures (OAC 3745-2)
WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum
WQS = Ohio Water Quality Standards (OAC 3745-1)

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] 7-day average limit.

[m] minimum limit

Attachment 1. Whole Effluent Toxicity Reasonable Potential Analysis

Whole effluent toxicity testing produced only non-detection results for acute toxicity in *Ceriodaphnia dubia* and *Pimephales promelas*, and therefore fall under Hazard Category 4. The reasonable potential analyses in Tables 3B, 3C, and 3D were only performed for *Ceriodaphnia dubia* and *Pimephales promelas* chronic toxicity (TUc Cd/Pp).

Hazard Category Summary

	Ceriodaphnia dubia		***Pimephales promelas***	
	Acute	**Chronic**	**Acute**	**Chronic**
Effluent Toxicity (Table A)	4	3	4	1
Near-Field Impact (Table B)	4		4	
Far-field Impact (Table C)		4		4
	3		1	

Hazard Categories: 1: Toxicity adequately documented 3: Toxicity possible
2: Toxicity strongly suspected 4: No toxicity

Table A. Effluent Toxicity

	Ceriodaphnia dubia		***Pimephales promelas***	
	Acute	**Chronic**	**Acute**	**Chronic**
WLA	0.8	2.68	0.8	2.68
# of tests	6	6	6	6
Maximum value	AA	1.1	AA	5
Percent of tests >WLA	0	16.7	0	16.7
Geometric mean	0.2	1.01	0.2	1.31
Average Exceedance (Geomean * Percent of tests >WLA)	--	16.87	--	21.88
Average Exceedance / WLA	--	6.29	--	8.16

Attribute Evaluated	**Hazard Category 1**	**Hazard Category 2**	**Hazard Category 3**	**Hazard Category 4**
Degree of Toxicity	Adequately Documented	Strongly Suspected	Possible	None
(1) Minimum number of tests	3	1 TUc Pp	0 or 1 TUc Cd	0 or 1 TUa Cd, TUA Pp
(2) Percent of tests >WLA	>30	20 to 30	10 to 20 TUc Pp, TUc Cd	10 TUa Pp, TUa CD
(3) Average Exceedance/WLA[1] (Tables B and C data not available)				
(a) Acute[2]	> 0.3	≥ 0.3	≥ 0.2	< 0.2 TUa, Cd
(b) Chronic	> 0.3 TUa, Cd, TUa, Pp	≥ 0.3	≥ 0.2	< 0.2 TUa, Pp
(3) Average Exceedance/WLA[1] (Tables B and C data available)				
(a) Acute[2]	> 0.5 --	≥ 0.3 --	≥ 0.3 --	< 0.3 --

Attribute Evaluated	Hazard Category 1	Hazard Category 2	Hazard Category 3	Hazard Category 4
Degree of Toxicity	Adequately Documented	Strongly Suspected	Possible	None
(b) Chronic	>0.67 --	≥ 0.5 --	≥ 0.5 --	< 0.5 --
(4) Maximum TU value (Tables 3B and 3C data not available)	≥(3xWLA)	≥WLA TUc Pp	≥WLA TUc Cc	<WLA TUa Cc, TUa, Pp

Addendum 1. Acronyms

ABS	Anti-backsliding
BPJ	Best professional judgment
CFR	Code of Federal Regulations
CMOM	Capacity Management, Operation, and Maintenance
CONSWLA	Conservative substance wasteload allocation
CSO	Combined sewer overflow
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DMT	Dissolved metal translator
IMZM	Inside mixing zone maximum
LTCP	Long-term Control Plan
MDL	Analytical method detection limit
MGD	Million gallons per day
NPDES	National Pollutant Discharge Elimination System
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
ORSANCO	Ohio River Valley Water Sanitation Commission
PEL	Preliminary effluent limit
PEQ	Projected effluent quality
PMP	Pollution Minimization Program
PPE	Plant performance evaluation
SSO	Sanitary sewer overflow
TMDL	Total Daily Maximum Load
TRE	Toxicity reduction evaluation
TU	Toxicity unit
U.S. EPA	United States Environmental Protection Agency
WET	Whole effluent toxicity
WLA	Wasteload allocation
WPCF	Water Pollution Control Facility
WQBEL	Water-quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater Treatment Plant