National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit to Discharge to Waters of the State of Ohio
for City of Celina Wastewater Treatment Plant (WWTP)

Public Notice No.: 173960
Public Notice Date: February 2, 2023
Comment Period Ends: March 4, 2023

Ohio EPA Permit No.: 2PD00033*SD
Application No.: OH0020320

Name and Address of Applicant:
City of Celina
225 North Main Street
Celina, OH 45822

Name and Address of Facility Where Discharge Occurs:
Celina WWTP
1125 South Elm Street
Celina, OH 45822
Mercer County

Receiving Water: Beaver Creek

Subsequent Stream Network: Wabash River, 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.

Antidegradation provisions in Ohio Administrative Code (OAC) Chapter 3745-1 describe the conditions under which water quality may be lowered in surface waters. 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/or monitoring requirements proposed for all parameters are the same as in the current permit, except those listed below.

New limits are proposed for butyl benzyl phthalate, cadmium, lead, and selenium based on the reasonable potential to exceed the wasteload allocation. A 48-month compliance schedule to attain compliance with the new limits is proposed.

Monitoring requirements for barium, bis(2-ethylhexyl) phthalate, iron, and silver are proposed to be removed due to a lack of reasonable potential to exceed the wasteload allocation.

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.

Monitoring for *E. coli* at upstream station 801 and downstream station 901 is proposed to change to once per two weeks for the months of June through August. The increased frequency over a shorter duration will facilitate impairment assessment of the recreation use.

New monitoring for Total Kjeldahl Nitrogen is proposed at station 801 and 901 to provide data for future nutrient studies. Monitoring for water temperature, dissolved oxygen, and pH is proposed to be removed from station 801, as is monitoring for dissolved oxygen at station 901.

New monitoring at 601 for butyl benzyl phthalate is proposed due to reasonable potential to exceed the WLA at Outfall 001. Monitoring at influent station 601 for chromium, copper, total cyanide, mercury, nickel, silver, and zinc is proposed to be removed due to a lack of reasonable potential to exceed the WLA at Outfall 001.

A 60-month schedule of compliance is proposed to develop a No Feasible Alternatives analysis to eliminate the Outfall 002 bypass and implement any recommended controls.

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. The permittee shall use ASTM D7237-10, OIA-1677-09, or

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; supplemental effluent data; and outfall signage.

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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 David Brumbaugh at (614) 644-2138 or david.brumbaugh@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

Celina WWTP discharges to Beaver Creek at River Mile 10.18. Figure 1 shows the approximate location of the facility.

This segment of the Beaver Creek is described by Ohio EPA River Code: 22-100, Hydrologic Unit Code: 05120101-03-02, County: Mercer, Ecoregion: Eastern Corn Belt Plains. The Beaver Creek is designated for the following uses under Ohio's WQS (OAC 3745-1-29): Modified Warmwater Habitat, Agricultural Water Supply, Industrial Water Supply, Primary Contact Recreation.

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

Celina WWTP was constructed in 1992 and last upgraded in 2020. The average design flow is 3.0 million gallons per day (MGD). Celina WWTP serves the City of Celina and East Jefferson Township, a population of approximately 13,000. Celina WWTP has the following treatment processes (Figure 2):

- Screening
- Grit, scum removal
- Oxidation Ditch
- Secondary Clarification
- Post-aeration
- Ultraviolet (UV) disinfection

Celina WWTP has a bypass at the headworks, monitored as Outfall 002. When influent flow rate exceeds 15 MGD, excess flows overtop a fixed weir prior to screening and are discharged directly to the receiving stream. These flows bypass all treatment at the facility. The City of Celina has 100% separate sewers in the collection system. A 59-month compliance schedule is proposed for the City to develop a No Feasible Alternatives analysis and implement any recommended controls.

The City of Celina does not have an approved pretreatment program but has one significant, categorical industrial user, which discharges 0.09 MGD.

Celina WWTP utilizes the following sewage sludge treatment processes:

- Gravity thickening
- Aerobic digestion
- Mechanical dewatering – screw press

Table 1 shows the last five years of sludge removed from Celina WWTP. Treated sludge is land applied and monitored via station 581. Monitoring for sludge disposal via landfill (station 586) is also proposed.

DESCRIPTION OF EXISTING DISCHARGE

Table 2 presents the effluent violations for Celina WWTP during the previous five years. The ammonia limit violations in 2022 were caused by gasoline leaks identified in the collection system, which inhibited the biological treatment of ammonia; the leaks have been repaired.

Table 3 presents the average annual effluent flow rate for Celina WWTP for the previous five years. Celina WWTP estimates there is an infiltration/inflow (I/I) rate to the collection system of 1.1 MGD. To minimize I/I, Celina WWTP monitors for I/I sources and eliminates them when necessary.

Table 4 presents the number of SSOs reported by Celina WWTP for the previous five years. SSOs are reported at station 300.

Table 5 presents data characterizing bypass activity at Celina WWTP for the previous five years. Bypasses are reported at station 002.

Table 6 presents data characterizing the annual total phosphorus load from Celina WWTP during the previous five years.

Table 7 presents chemical specific data compiled from supplemental effluent testing data submitted as part of the NPDES renewal application and from data collected by Ohio EPA.

Table 8 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period October 2017 through September 2022, and current permit limits are provided for comparison.

Table 9 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 10 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.

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 Hardin Creek-Beaver Creek watershed assessment unit, which includes the Beaver Creek in the vicinity of Celina WWTP, is listed as impaired for aquatic life and recreation use 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 Beaver Creek in September 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.

Beaver Creek is impaired for recreational and aquatic life use due to the following: Non-irrigated crop production, animal feeding operations, confined animal feeding operations, removal of riparian vegetation, stream bank destabilization, and home sewage treatment systems.

The following summary is from the Executive Summary, Biological and Water Quality Survey of the Wabash River Basin, 1999; Revised August 12, 2008(Ohio EPA) states:

> To facilitate agricultural crop production and prevent flooding, the Wabash basin is maintained to quickly convey rainfall downstream. Nearly all stream channels have been modified and an extensive tile drainage network has been installed. Riparian vegetation has been removed. Stream banks are engineered and pool or

riffle areas have been converted into laminar glides. Natural stream habitats are essentially absent in the Wabash basin.

Confined animal feeding operations in Ohio are most numerous in the Wabash watershed. High fecal coliform bacteria concentrations are routine in area streams. Stream substrates are typically embedded and smothered by silt. Abundant algal growth, encouraged by universal nutrient enrichment, affords ample organic decomposition and confounds dissolved oxygen availability. In Ohio, fish kills resulting from pollutant spills and improper manure management are most numerous in the Wabash basin.

Due to habitat simplification and hydromodification, only the most pollution tolerant types of aquatic life reside in the watershed. The altered flow regime retards aquatic community performance especially in the watersheds uppermost reaches where the streams often become dry. Achievement of warmwater ecoregional biocriteria is not possible in the basin due to the pervasiveness of habitat disruption and the amount of pollutant loading. In short, water resource conditions in the Wabash River watershed are poor.

The Wabash River basin, including the Mississinewa River, Beaver Creek and all joining tributaries ranks among the ten most degraded watersheds in Ohio. Stream habitat destruction for agricultural drainage and its attendant hydrologic disruption pervades the entire watershed. Land applied animal manure from large animal feeding operations (AFOs) resulted in significant organic and nutrient enrichment throughout the watershed. The hypereutrophic conditions in Grand Lake St. Marys were an intrinsic aquatic life use impairment and resulted in water quality and aquatic life use impairment to the Wabash River mainstem downstream from its confluence with Beaver Creek (the outlet stream for Grand Lake St. Marys).

The TMDL Development for the Beaver Creek and Grand Lake St. Marys Watershed, Ohio (Ohio EPA) states:

The daily loads, needed reductions, and WLA for site 605020 suggest that during lower flow conditions, the Celina WWTP discharge is a significant component of the allowable TP load. In fact, the calculated total phosphorus and nitrate WLAs for the Celina WWTP for some flow conditions had to be set to zero in Table 4- 16 to ensure that the TMDL equals the LA + WLA + MOS. The load from the WWTP is also a significant component of the nitrate load; however, the load duration analysis indicates that no nitrate reductions are required during low flow conditions.

Celina WWTP is contributing to the impairments in Beaver Creek due to being a source of nutrient load. The current limits for total phosphorus are proposed to continue.

The full Integrated Report is available through the Ohio EPA, Division of Surface Water website at:
https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/ohio-integrated-water-quality-monitoring-and-assessment-report

The TMDL is available through the Ohio EPA, Division of Surface Water website at:
https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/wabash-river-watershed

The *Executive Summary - Biological and Water Quality Survey of the Wabash River Basin, 1999* is available through the Ohio EPA, Division of Surface Water website at:
https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/biological-and-water-quality-reports

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 Celina WWTP 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)	October 2017 through September 2022
NPDES renewal application data	2022
Ohio EPA compliance sampling data	2022

Statistical Outliers and Other Non-representative Data
The data were examined and one value was removed from the evaluation:

- Iron – March 2, 2020 (759 µg/L) – removed as outlier, five times higher than next highest value.

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 9). 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 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
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 Celina WWTP, the WLA values are 0.3 TU_a and 1.0 TU_c.

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

$$\text{Downstream Dilution Ratio} = \frac{1Q10 + [\text{WWTP flow rate}]}{[\text{WWTP flow rate}]} = \frac{0 \text{ cfs} + 4.64 \text{ cfs}}{4.64 \text{ cfs}} = 1$$

The acute WLA for Celina WWTP is 30 percent mortality in 100 percent effluent based on the dilution ratio of 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 9, 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 Celina WWTP outfall 001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Dissolved Oxygen, CBOD5, and TSS
The limits proposed for dissolved oxygen, total suspended solids (TSS), and 5-day carbonaceous biochemical oxygen demand (CBOD5) are all based on plant design criteria. The current TSS and CBOD5 have been effective since the 2007 plant expansion from 2.5 to 3.0 MGD, when load limits were maintained from the previous permit and concentration limits were lowered accordingly. The TSS and CBOD5 limits are more stringent than the Secondary Treatment Standards in 40 CFR Part 133. The current dissolved oxygen limit is protective of WQS.

Ammonia
The current limits for each season (June-September, October-November & March-May, and December-February) are based on previous wasteload allocations. The current limits for ammonia were evaluated using WLA procedures and were found to be protective of WQS for ammonia toxicity, though the effluent violations noted earlier have resulted in a PEQ average for ammonia (June-Sept) that exceeds the wasteload allocation.

Although the current WLA would allow slightly higher limits for ammonia, anti-backsliding provisions in the OAC prevent the imposition of less stringent limits than those in the existing permit unless specific conditions have been satisfied. In the case of the Celina WWTP, none of those conditions have been satisfied, so the existing limits are proposed to continue. The anti-backsliding provisions of OAC 3745-33-05(F) require that an anti-degradation review must be completed before an existing permit limit can be made less stringent. The rule requires other conditions to be satisfied as well.

***E. coli*, Oil & Grease, and pH**
Limits proposed for *Escherichia coli* and pH, are based on WQS (OAC 3745-1-35 and 37). Primary contact recreation *E. coli* standards apply to the Beaver Creek. The limit for oil and grease is based on WQS but has been adjusted to maintain the permitted amount of the pollutant after the 2007 facility expansion.

Butyl Benzyl Phthalate, Cadmium, Dissolved Hexavalent Chromium, Lead, and Selenium
The Ohio EPA risk assessment (Table 15) places these parameters in group 5. This placement, as well as the data in Tables 8 and 9, indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For these parameters, either the PEQ exceeds the WLA or 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 current limits for dissolved hexavalent chromium are proposed to continue, effective immediately. New limits are proposed for butyl benzyl phthalate, cadmium, lead, and selenium, and a 48-month compliance schedule is proposed for the permittee to attain compliance with these new limits.

Chromium, Copper, Free Cyanide, Mercury, Nickel, Total Filterable Residue, and Zinc
The Ohio EPA risk assessment (Table 15) places these parameters in groups 2 and 3. This placement, as well as the data in Tables 8 and 9, 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.

Arsenic, Barium, Bis(2-ethylhexyl) Phthalate, Di-n-butyl Phthalate, Diethyl Phthalate, Dimethyl Phthalate, Iron, Silver, Strontium
The Ohio EPA risk assessment (Table 15) places these parameters in groups 2 and 3. This placement, as well as the data in Tables 8 and 9, 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. Monitoring for iron, barium, silver, and bis(2-ethylhexyl) phthalate is proposed to be removed. Data for these parameters will be provided by NPDES permit renewal application requirements for the reasonable potential analysis.

Flow Rate, Rainfall, and Water Temperature
Monitoring for these parameters is proposed to continue in order to evaluate the performance of the treatment plant.

Nitrate plus Nitrite and Total Kjeldahl Nitrogen
The 2022 *Ohio Integrated Water Quality Monitoring and Assessment Report* (Ohio EPA) lists the Beaver Creek watershed as impaired for aquatic life. Nutrients and organic enrichment are listed as "high magnitude" causes, and major municipal point sources are listed among the "high magnitude" sources. Considering this information and the fact that municipal WWTPs discharge a nutrient load to the river, monthly monitoring for nitrate + nitrite and total Kjeldahl nitrogen is proposed based on best technical judgment. New monitoring for total Kjeldahl nitrogen at the upstream and downstream stations also is proposed. The purpose of the monitoring is to maintain a nutrient data set for use in the future studies. Nitrate plus nitrite was evaluated using WLA procedure and determined to be protective of the wasteload allocation.

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.

Total Phosphorus
The 2007 TMDL recommends a daily load for total phosphorus of 9.46 kg/day for the Celina wastewater plant. At the plant's current design flow of 3.0 MGD, an average concentration limit of 0.83 mg/L is necessary to comply with the TMDL approved WLA, and this is proposed as a final effluent limit.

Whole Effluent Toxicity Reasonable Potential
Based on evaluating the WET data presented in Table 10, and other pertinent data under the provisions of OAC 3745-33-07(B), the Celina WWTP is placed in Category 4 with respect to WET. While this indicates that the plant's effluent does not currently pose a toxicity problem, annual toxicity testing is proposed consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Additional Monitoring Requirements
Monitoring for E. coli at upstream station 801 and downstream station 901 is proposed to change to once per two weeks for the months of June through August. The increased frequency over a shorter duration will facilitate impairment assessment of the recreation use.

Monitoring for water temperature, dissolved oxygen, and pH is proposed to be removed from station 801, as is monitoring for dissolved oxygen at station 901. These data are not needed for reasonable potential analyses.

New monitoring at 601 for butyl benzyl phthalate is proposed due to reasonable potential to exceed the WLA at Outfall 001. Monitoring at influent station 601 for chromium, copper, total cyanide, mercury, nickel, silver, and zinc is proposed to be removed due to a lack of reasonable potential to exceed the WLA at Outfall 001.

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 and removal to sanitary landfill.

OTHER REQUIREMENTS

Compliance Schedule

New Effluent Limits - A 48-month compliance schedule is proposed for the Celina WWTP to meet the new final effluent limits for cadmium, lead, and selenium. Details are in Part I.C of the permit.

No Feasible Alternative Analysis Schedule - A 59-month compliance schedule is proposed for Celina WWTP to develop a No Feasible Alternatives analysis to eliminate the Outfall 002 bypass and implement any recommended controls. 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 Celina WWTP to have a Class III 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.

Method Detection Limit Reporting
When submitting monitoring results in eDMR, the permittee must report all detected concentration values above the method detection limit (MDL), even if that value is below the quantification level, as indicated in Permit Guidance 9: *Limits below Quantification*. A detection above the MDL indicates the presence of a pollutant with strong confidence, which must be considered in reasonable potential analyses. Per OAC 3745-33-07(C)(2)(c), for the purpose of assessing compliance, any value reported below the quantification level shall be considered in compliance with an effluent limit.

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

NPDES Renewal Application Supplemental Effluent Data
The permittee must submit supplemental effluent data as part of the next NPDES permit renewal application. A minimum of three samples must be tested for 101 parameters, each collected within four and one-half years of the application submission date. The complete list of parameters to be analyzed is contained in Table 2 of "Appendix J to Part 122 - NPDES Permit Testing Requirements for Publicly Owned Treatment Works (§122.21(j))." Existing effluent data may be used, if available, in lieu of sampling performed solely for the purpose of the renewal application. See Part II of the permit for details.

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

Storm Water Compliance
To comply with industrial storm water regulations, the permittee submitted a form for "No Exposure Certification" which was signed on March 14, 2022. The certification number is 2GRN0448*DG. Compliance with the industrial storm water regulations must be re-affirmed every five years. No later than March 13, 2027, the permittee must submit a new form for "No Exposure Certification" or make other provisions to comply with the industrial storm water regulations.

Figure 1. Location of Celina WWTP

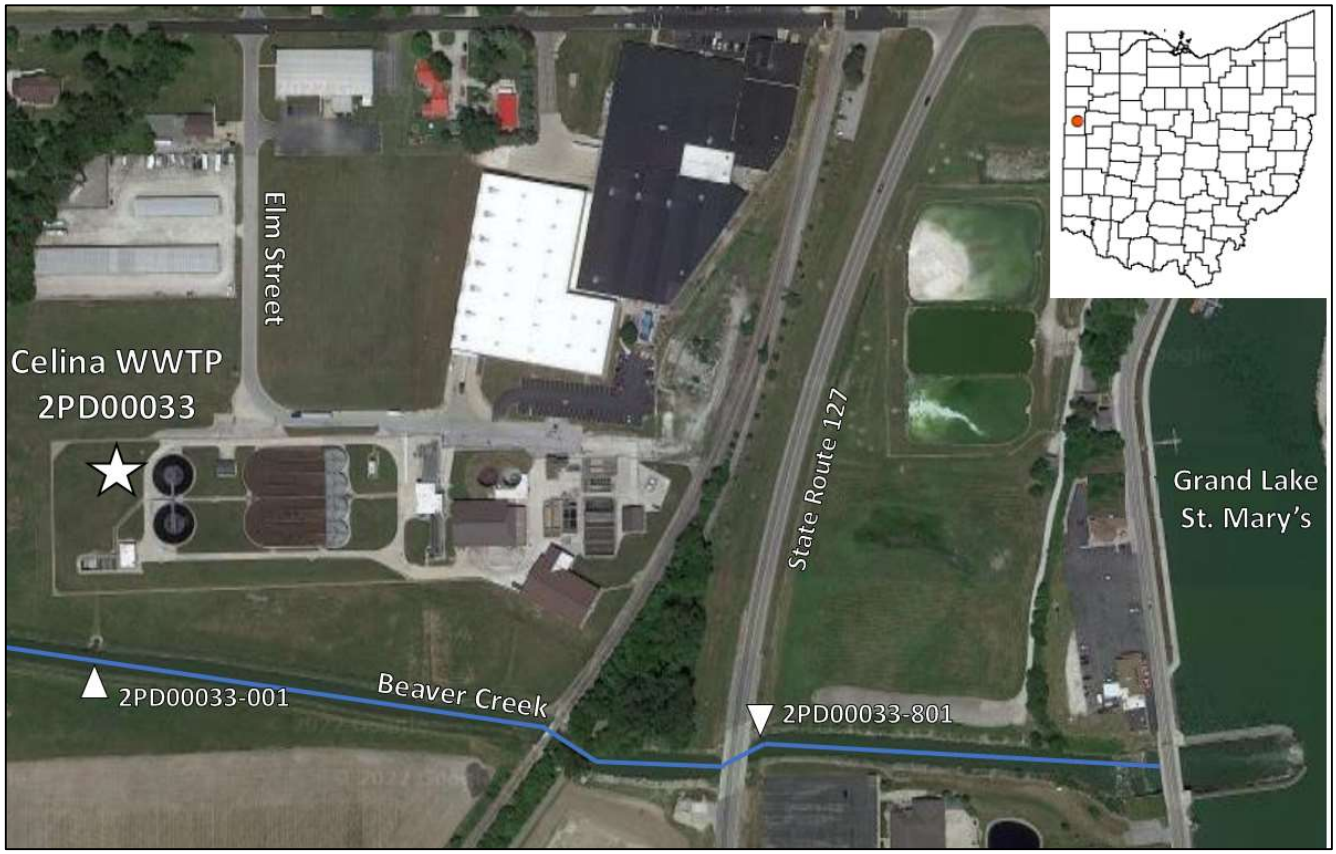

Figure 2. Diagram of Wastewater Treatment System

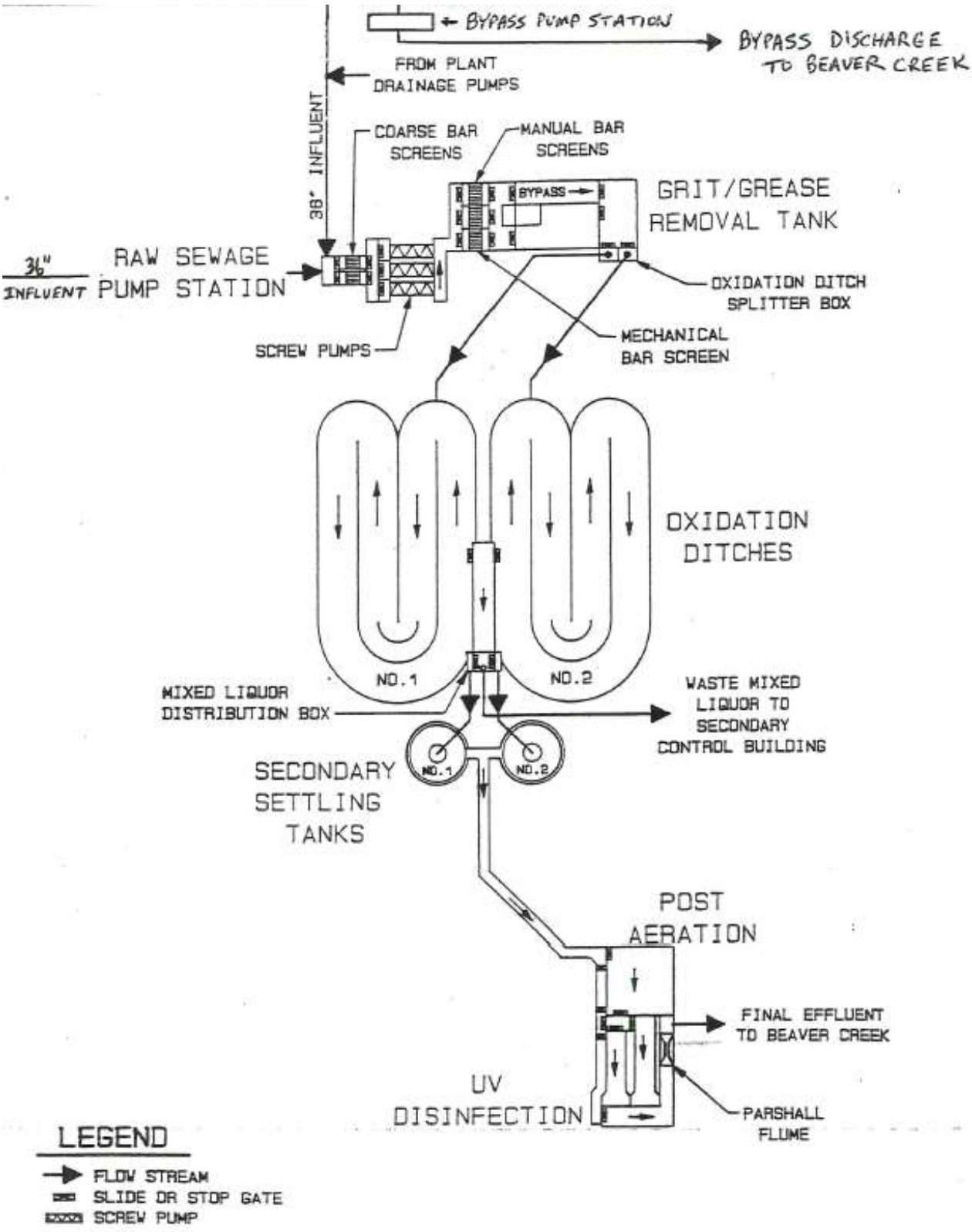

Table 1. Sewage Sludge Removal

Year	Dry Tons Removed	
	Station 581	Station 586
2017	62.15	128.63
2018	48.43	135.14
2019	75.82	128.9
2020	219.59	--
2021	155.6	--

Table 2. Effluent Violations for Outfall 001

Parameter	2017 [a]	2018	2019	2020	2021	2022 [b]	Total
Chromium, Dissolved Hexavalent	0	0	4	0	0	0	**4**
Dissolved Oxygen	0	1	0	1	2	0	**4**
Ammonia	0	2	4	0	8	9	**23**
Phosphorus	0	0	0	1	0	0	**1**
Total	**0**	**3**	**8**	**2**	**10**	**9**	**32**

[a] = data for October through December
[b] = data for January through September

Table 3. Average Annual Effluent Flow Rates

Year	Annual Flow (MGD)		
	50th Percentile	95th Percentile	Maximum
2017[a]	1.45	2.79	17.37
2018	1.97	5.58	14.28
2019	2.11	7.37	16.28
2020	1.95	6.22	10.66
2021	1.70	4.92	14.21
2022 [b]	1.86	4.25	11.83

MGD = million gallons per day.
[a] = data for October through December
[b] = data for January through September

Table 4. Sanitary Sewer Overflows Discharges

Year	Occurrences
2017[a]	--
2018	--
2019	1
2020	1
2021	--
2022[b]	

[a] = data for October through December
[b] = data for January through September

Table 5. Bypass Discharges

Year	Number of days	Annual Volume (Million Gallons)	Median TSS (mg/L)	Median CBOD5 (mg/L)
2017[a]	2	1.45	165	55.5
2018	6	5.25	87	55.2
2019	8	14.94	61.1	46.3
2020	12	10.59	90.5	33.8
2021	7	9.87	140	40
2022[b]	4	2.44	258	48.7

[a] = data for October through December
[b] = data for January through September

Table 6. Calculated Annual Total Phosphorus Loadings

Year	Median Phosphorus (mg/L)	Median Flow (MGD)	Median Loading (kg/day)
2017[a]	0.57	1.45	3.14
2018	0.23	1.97	1.72
2019	0.39	2.11	3.12
2020	0.49	1.95	3.61
2021	0.54	1.70	3.48
2022[b]	0.48	1.86	3.37

[a] = data for October through December
[b] = data for January through September
MGD = million gallons per day

Table 7. Effluent Characterization Using NPDES Application and Ohio EPA Data

Parameter	Units	Ohio EPA 3/23/2022	NPDES App 7/20/2022	NPDES App 7/25/2022	NPDES App 8/4/2022
Aluminum	µg/L	80.6	NT	NT	NT
Ammonia	mg/L	AA (0.45)	NT	NT	NT
Arsenic	µg/L	0.924	1.04	1.063	1.73
Barium	µg/L	28.3	NT	NT	NT
Bis(2-ethyl hexyl) phthalate	µg/L	AA (2.81)	AA (3.26)	AA (1.58)	AA (1.92)
Butyl Benzyl phthalate	µg/L	2.44	AA (6.57)	AA (3.18)	AA (4.81)
Cadmium	µg/L	0.024	AA (1.06)	AA (1.06)	AA (1.06)
Chromium	µg/L	0.0241	0.413	5.51	0.31
Copper	µg/L	1.39	AA (1.9)	AA (1.9)	2.035
Dibutyl phthalate	µg/L	1.58	AA (4.37)	AA (2.12)	AA (4.81)
Diethyl phthalate	µg/L	2.16	AA (3.9)	AA (1.89)	AA (9.62)
Dimethyl phthalate	µg/L	0.635	AA (3.54)	AA (1.72)	AA (4.81)
Free Cyanide	µg/L	2.81	AA (2)	AA (2)	AA (2)
Iron	mg/L	37.1	NT	NT	NT
Lead	µg/L	1.51	AA (0.64)	AA (0.64)	AA (0.64)
Manganese	µg/L	8.38	NT	NT	NT
Mercury	ng/L	NT	AA (100)	AA (100)	AA (100)
Nickel	µg/L	0.715	0.903	1.772	1.046
Nitrate plus nitrite	mg/L	5.76	NT	NT	NT
Selenium	µg/L	AA (1.2)	AA (0.997)	AA (0.997)	AA (0.997)
Silver	µg/L	0.0185	AA (0.86)	AA (0.86)	AA (0.86)
Strontium	µg/L	338	NT	NT	NT
Total Filterable Residue	mg/L	596	NT	NT	NT
Zinc	µg/L	20.4	10.88	7.08	15.95

AA = not-detected (analytical method detection limit)

Table 8. Effluent Characterization Using Self-Monitoring Data

Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
		30 Day	Daily		50th	95th	
Water Temperature	°C	- - - - Monitor - - - -		1796	17	26	8 - 28
Dissolved Oxygen	mg/L	--	6.0[m]	1796	8.3	6.7*	4.1 - 10.5
Total Suspended Solids	kg/day	114	171[w]	712	< 12.3	38.4	0 - 336
Total Suspended Solids	mg/L	10	15[w]	712	< 2	4.2	0 - 22.1
Oil and Grease	mg/L	--	8.3	61	< 5	2.5	0 - 8.3
Ammonia - Dec-Feb (2018-22)	kg/day	34.1	51.1[w]	155	< 1.16	2.38	0 - 68
Ammonia - Dec-Feb (2017-18)	kg/day	37.5	56.8[w]	24	--	--	< .949
Ammonia - Dec-Feb (2018-22)	mg/L	3.0	4.5[w]	155	< .2	.236	0 - 3.1
Ammonia - Dec-Feb (2017-18)	mg/L	3.3	5.0[w]	24	--	--	< .2
Ammonia - June-Sep	kg/day	3.41	12.5[w]	230	< 1.08	16.3	0 - 54.6
Ammonia - June-Sep	mg/L	0.30	1.1[w]	230	< .2	2.21	0 - 5.6
Ammonia - Mar-May & Oct-Nov (2018-22)	kg/day	15.9	23.9[w]	276	< 1.13	4.06	0 - 37.6
Ammonia - Mar-May & Oct-Nov (2017)	kg/day	27.3	39.8[w]	24	< 1.26	2.28	0 - 5.45
Ammonia - Mar-May & Oct-Nov (2018-22)	mg/L	1.4	2.1[w]	276	< .2	.503	0 - 2
Ammonia - Mar-May & Oct-Nov (2017)	mg/L	2.4	3.5[w]	24	< .2	.311	0 - .53
Nitrogen Kjeldahl, Total	mg/L	- - - - Monitor - - - -		55	.69	1.55	0 - 3.88
Nitrite Plus Nitrate, Total	mg/L	- - - - Monitor - - - -		59	5.42	13.6	0 - 19.9
Phosphorus, Total	kg/day	9.43	14.1[w]	237	2.88	6.19	0 - 12.5
Phosphorus, Total	mg/L	0.83	1.24[w]	237	.45	.882	0 - 1.28
Orthophosphate	mg/L	- - - - Monitor - - - -		67	.3	.953	0 - 1.17
Cyanide, Free	mg/L	- - - - Monitor - - - -		1	--	--	< .003
Iron, TR	µg/L	- - - - Monitor - - - -		19	31.4	202	0 - 759
Barium, TR	µg/L	- - - - Monitor - - - -		19	22.9	35.3	0 - 37.4
Nickel, TR	µg/L	- - - - Monitor - - - -		19	< 10	1.58	0 - 4
Silver, Total (Ag)	µg/L	- - - - Monitor - - - -		4	--	--	< .4
Silver, TR	µg/L	- - - - Monitor - - - -		18	--	--	< 10
Zinc, TR	µg/L	- - - - Monitor - - - -		19	30.3	43.4	0 - 56.2
Cadmium, TR (All)	kg/day	0.0636	0.148	4	--	--	< .00436
Cadmium, TR (All)	µg/L	5.6	13	4	--	--	< 1
Cadmium, TR (Quarterly – Alt)	µg/L	- - - - Monitor - - - -		18	< 1.06	.75	0 - 5
Lead, TR	µg/L	- - - - Monitor - - - -		19	< .64	2.5	0 - 25
Chromium, TR	µg/L	- - - - Monitor - - - -		19	< 10	2.1	0 - 17

Copper, TR (All)	kg/day	0.25	0.387	4	--	--	< .0305
Copper, TR (All)	µg/L	22	34	4	--	--	< 7
Copper, TR (Quarterly – Alt)	µg/L	- - - - Monitor - - - -		18	< 10	4	0 - 4.02
Selenium, Total (Se)	µg/L	- - - - Monitor - - - -		18	< 2	2.25	0 - 15
Chromium, Dissolved Hexavalent (All)	kg/day	0.125	0.182	63	< .033	.0777	0 - .19
Chromium, Dissolved Hexavalent (All)	µg/L	11	16	63	< 5	10	0 - 30
Chromium, Dissolved Hexavalent (Quarterly – Alt)	µg/L	- - - - Monitor - - - -		1	--	--	< 10
E. coli (2018-22)	#/100 mL	126	284[w]	336	4	149	0 - 2420
E. coli (2017)	#/100 mL	161	362[w]	12	47.5	139	4 - 205
Bis(2-ethylhexyl) Phthalate	µg/L	- - - - Monitor - - - -		18	--	--	< 5
Rainfall in Inches	Inches	- - - - Monitor - - - -		1673	0	.794	0 - 4.05
Flow Rate	MGD	- - - - Monitor - - - -		1796	1.89	5.4	1.04 - 17.4
Mercury, Total	ng/L	- - - - Monitor - - - -		19	1.19	4	0 - 13
Cyanide, Free	µg/L	- - - - Monitor - - - -		19	< 4.1	2.12	0 - 4.1
Acute Toxicity, Ceriodaphnia dubia	TUa	- - - - Monitor - - - -		4	--	--	< .2
Chronic Toxicity, Ceriodaphnia dubia	TUc	- - - - Monitor - - - -		4	--	--	< 1
Acute Toxicity, Pimephales promelas	TUa	- - - - Monitor - - - -		4	--	--	< .2
Chronic Toxicity, Pimephales promelas	TUc	- - - - Monitor - - - -		4	--	--	< 1
pH, Maximum	S.U.	--	9.0	1796	7.8	8.1	7 - 8.9
pH, Minimum	S.U.	--	6.5[m]	1796	7.7	7.4*	6.6 - 8.9
Residue, Total Filterable	mg/L	- - - - Monitor - - - -		19	530	701	485 - 750
CBOD5 (Summer)	kg/day	95.4	148[w]	354	< 15	41.9	0 - 141
CBOD5 (Summer)	mg/L	8.4	13[w]	354	< 3	5.6	0 - 14.5
CBOD5 (Winter)	kg/day	148	214[w]	356	< 17.3	64.4	0 - 263
CBOD5 (Winter)	mg/L	13	18.8[w]	356	< 3	5.9	0 - 12

* = For minimum pH, 5th percentile shown in place of 50th percentile.
** = For dissolved oxygen, 5th percentile shown in place of 95th percentile.
[a] = weekly average.
[m] = minimum limit

Table 9. Projected Effluent Quality for Outfall 001

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Aluminum	µg/L	1	1	365	500
Ammonia (Summer)	mg/L	244	79	2.08	2.42
Ammonia (Winter)	mg/L	179	14	0.25	0.34
Arsenic	µg/L	4	4	3.28	4.50
Barium	µg/L	21	19	39.4	61.2
Bis(2-ethylhexyl) phthalate	µg/L	23	0	--	--
Butyl benzyl phthalate	µg/L	2	1	8.82	12.08
Cadmium	µg/L	23	2	4.75	6.5
Chromium	µg/L	22	7	16.1	22.1
Copper	µg/L	27	8	3.05	5.08
Free cyanide	µg/L	25	5	3.25	5.29
Di-n-butyl phthalate	µg/L	2	1	5.88	8.06
Diethyl phthalate	µg/L	2	1	5.99	8.21
Dimethyl phthalate	µg/L	1	1	2.87	3.94
Dissolved hexavalent chromium	µg/L	67	23	10.1	15.4
Iron	µg/L	20	17	80.7	136
Lead	µg/L	21	2	23.7	32.5
Manganese	µg/L	1	1	37.9	52.0
Mercury	ng/L	20	19	4.76	8.37
Nickel	µg/L	24	9	2.09	3.6
Nitrate + Nitrite	mg/L	61	58	14.53	19.9
Selenium	µg/L	16	1	16.4	22.5
Silver	µg/L	1	1	0.084	0.115
Strontium	µg/L	1	1	1530	2096
Total filterable residue	mg/L	21	21	637	721
Zinc	µg/L	24	23	49.3	76.6

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 10. Summary of Acute and Chronic Toxicity Results

	Ceriodaphnia Dubia		*Pimephales promelas*	
Date	**TU_a**	**TU_c**	**TU_a**	**TU_c**
9/17/2018	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
9/16/2019	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
9/1/2020	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
9/8/2021	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
9/12/2022	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 11. Use Attainment Table

Location	RM	Use	Status	Cause	Source
Beaver Creek downstream of Grand Lake St Mary's to mouth	4.8	MWH	Non	Nutrients Sedimentation Habitat degradation	Non-irrigated crop production AFOs and CAFOs Channelization Removal of riparian vegetation Point Source Discharges

AFOs and CAFOs = animal feeding operations and confined animal feeding operations
RM = River mile
MWH – modified 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	
Aluminum	µg/L	--	--	--	--	--
Ammonia (Summer)	mg/L	--	--	0.5	--	--
Ammonia (Winter)	mg/L	--	--	4.4	--	--
Arsenic	µg/L	--	100	150	340	680
Barium	µg/L	--	--	1200	5000	10000
Bis(2-ethylhexyl) phthalate	µg/L	3.7[c]	--	8.4	1100	2100
Butyl benzyl phthalate	µg/L	1	--	23	130	260
Cadmium	µg/L	--	50	4.2	9.9	20
Chromium	µg/L	--	100	150	3200	6400
Copper	µg/L	--	500	17	27	54
Free cyanide	µg/L	400	--	--	46	92
Di-n-butyl phthalate	µg/L	30	--	--	--	--
Dissolved Hexavalent Chromium	µg/L	--	--	11	16	31
Diethyl phthalate	µg/L	600	--	220	980	2000
Dimethyl phthalate	µg/L	2000	--	1100	3200	6400
Iron	µg/L	--	5000	--	--	--
Lead	µg/L	--	100	16	300	590
Manganese	µg/L	--	--	--	--	--
Mercury	ng/L	12	10000	910	1700	3400
Nickel	µg/L	4600	200	94	840	1700
Nitrate + Nitrite	mg/L	--	100	--	--	--
Selenium	µg/L	4200	50	5	62	120
Silver	µg/L	--	--	1.3	5.3	11
Strontium	µg/L	--	--	52000	130000	270000
Total filterable residue	mg/L	--	--	1500	--	--
Zinc	µg/L	26000	25000	220	220	430

[c] = carcinogen

Table 13. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Stream Flows				
All upstream flows	cfs	annual	0	Minimal release, Grand Lake St. Mary's
Mixing Assumption	%	average	100	
		maximum	100	
Hardness, OMZ	mg/L	annual	200	Station 901, 2017-22, n= 60, median
Hardness, IMZ	mg/L	annual	200	Station 901, 2017-22, n= 60, median
pH	S.U.	summer	8.5	Station 901, 2017-22, n= 20, 75th%
		winter	7.85	Station 901, 2017-22, n= 15, 75th%
Temperature	ºC	summer	25	Station 901, 2017-22, n= 20, 75th%
		winter	5	Station 901, 2017-22, n= 15, 75th%
Celina WWTP flow	cfs (MGD)	Annual	4.6417 (3.0)	NPDES Application Form 2A
Background Water Quality				
Aluminum	µg/L		610	Station Z01P01; 2022; n=1; 1<MDL;
Ammonia (summer)	mg/L		0	Station 801; 2017-22; n=20; 15<MDL;
Ammonia (winter)	mg/L		0.62	Station 801; 2017-22; n=15; 6<MDL;
Arsenic	µg/L		1.47	Station Z01P01; 2022; n=1; 1<MDL;
Barium	µg/L		45.6	Station Z01P01; 2022; n=1; 1<MDL;
Bis(2-ethylhexyl) phthalate	µg/L		0	No representative data available.
Butyl benzyl phthalate	µg/L		0	No representative data available.
Cadmium	µg/L		0.016	Station Z01P01; 2022; n=1; 1<MDL;
Chromium	µg/L		0.483	Station Z01P01; 2022; n=1; 1<MDL;
Dissolved hexavalent chromium	µg/L		0	No representative data available.
Copper	µg/L		1.34	Station Z01P01; 2022; n=1; 1<MDL;
Di-n-butyl phthalate	µg/L		0	No representative data available.
Diethyl phthalate	µg/L		0	No representative data available.
Dimethyl phthalate	µg/L		0	No representative data available.
Free cyanide	µg/L		0	No representative data available.
Iron	µg/L		988	Station Z01P01; 2022; n=1; 1<MDL;
Lead	µg/L		0.766	Station Z01P01; 2022; n=1; 1<MDL;
Manganese	µg/L		77.4	Station Z01P01; 2022; n=1; 1<MDL;
Mercury	ng/L		0	No representative data available.
Nickel	µg/L		2.37	Station Z01P01; 2022; n=1; 1<MDL;
Nitrate + Nitrite	mg/L		0.49	Station 801; 2017-22; n=59; 20<MDL;
Selenium	µg/L		0	Station Z01P01; 2022; n=1; 1<MDL;
Silver (lrw)	µg/L		0	No representative data available.
Strontium	µg/L		506	Station Z01P01; 2022; n=1; 1<MDL;
Total filterable residue	mg/L		291	Station Z01P01; 2010-12; n=42; 0<MDL;
Zinc	µg/L		0	Station Z01P01; 2022; n=1; 1<MDL;

MDL = analytical method detection limit
n = number of samples
NPDES = National Pollutant Discharge Elimination System

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	
Aluminum	µg/L	--	--	--	--	--
Ammonia (summer)	mg/L	--	--	0.5	--	--
Ammonia (winter)	mg/L	--	--	4.4	--	--
Arsenic	µg/L	--	100	150	340	680
Barium	µg/L	--	--	1200	5000	10000
Bis(2-ethylhexyl) phthalate	µg/L	3.7[c]	--	8.4	1100	2100
Butyl benzyl phthalate	µg/L	1	--	23	130	260
Cadmium	µg/L	--	50	4.2	9.9	20
Chromium	µg/L	--	100	150	3200	6400
Copper	µg/L	--	500	17	27	54
Di-n-butyl phthalate	µg/L	400	--	--	--	--
Diethyl phthalate	µg/L	30	--	220	980	2000
Dimethyl phthalate	µg/L	--	--	1100	3200	6400
Dissolved hexavalent chromium	µg/L	600	--	11	16	31
Free cyanide	µg/L	2000	--	--	46	92
Iron	µg/L	--	5000	--	--	--
Lead	µg/L	--	100	16	300	590
Manganese	µg/L	--	--	--	--	--
Mercury [B]	ng/L	12	10000	910	1700	3400
Nickel	µg/L	4600	200	94	840	1700
Nitrate + Nitrite	mg/L	--	100	--	--	--
Selenium	µg/L	4200	50	5	62	120
Silver	µg/L	--	--	1.3	5.3	11
Strontium	µg/L	--	--	52000	130000	270000
Total filterable residue	mg/L	--	--	1500	--	--
Zinc	µg/L	26000	25000	220	220	430

[B] Bioaccumulative Chemical of Concern (BCC); no mixing zone allowed after 11/15/2010, WQS must be met at end-of-pipe, unless requirements for an exception are met as listed in OAC 3745-2-05(A)(2)(e)(ii)

[C] carcinogen

Table 15. Parameter Assessment

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

Aluminum	Manganese	

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

Ammonia (winter)	Arsenic	Barium
Bis(2-ethylhexyl) phthalate	Chromium	Copper
Di-n-butyl phthalate	Diethyl phthalate	Dimethyl phthalate
Free cyanide	Iron	Nickel
Nitrate + Nitrite	Silver	Strontium

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

Mercury	Total Filterable Residue	Zinc

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.

No parameters apply to this category

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*
Ammonia (summer)	mg/L	0.5	--
Butyl benzyl phthalate	µg/L	1.0	130
Cadmium	µg/L	4.2	9.9
Dissolved Hexavalent Chromium	µg/L	11	16
Lead	µg/L	16	300
Selenium	µg/L	5	62

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	6.0[m]	--	--	--	PD
TSS	mg/L	15[d]	10	171[d]	114	PD
Oil & Grease	mg/L	8.3	--	--	--	WQS
Ammonia (June-Sept)	mg/L	1.1 [d]	0.3	12.5 [d]	3.41	WLA/ABS
Ammonia (Mar-May, Oct-Nov)	mg/L	2.1 [d]	1.4	23.9 [d]	15.9	WLA/ABS
Ammonia (Dec-Feb)	mg/L	4.5 [d]	3.0	51.1 [d]	34.1	WLA/ABS
Total Kjeldahl Nitrogen	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Nitrate plus Nitrite	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Phosphorus	mg/L	1.24 [d]	0.83	14.1 [d]	9.43	TMDL
Orthophosphate	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				PMR
Nickel	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Zinc	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Cadmium	µg/L	9.9	4.2	0.11	0.048	WLA
Lead	µg/L	300	16	3.4	0.18	WLA
Chromium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Copper	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Selenium	µg/L	62	5	0.7	0.057	WLA
Dissolved Hexavalent Chromium	µg/L	16	11	0.182	0.125	WLA
E. coli	#/100 mL	284 [d]	126	--	--	WQS
Butyl Benzyl Phthalate	µg/L	130	1.0	1.5	0.011	WLA
Rainfall	Inches	- - - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Flow Rate	MGD	- - - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Mercury	ng/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Free Cyanide	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
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
Total Filterable Residue	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
pH, maximum	SU	9.0	--	--	--	WQS
pH, minimum	SU	6.5[m]	--	--	--	WQS
CBOD5 (summer)	mg/L	13[d]	8.4	148[d]	95.4	PD
CBOD5 (winter)	mg/L	18.8[d]	13	214[d]	148	PD

[a] Effluent loadings based on average design discharge flow of 3.0 MGD.

[b] Definitions: BTJ = Best Technical Judgment
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary

Discharges
PD = Plant Design (OAC 3745-33-05(E))
PMR = Phosphorus monitoring requirements (ORC 6111.03)
TMDL = Total Maximum Daily Load
WET = Minimum testing requirements for whole effluent toxicity [OAC 3745-33-07(B)(11)]
WLA = Wasteload Allocation procedures (OAC 3745-2)
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

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