National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit to Discharge to Waters of the State of Ohio
for **Lucas County Water Resource Recovery Facility (WRRF)**

Public Notice No.: 22-10-002
Public Notice Date: October 26, 2022
Comment Period Ends: November 26, 2022

Ohio EPA Permit No.: **2PK00000*ND**
Application No.: **OH0034223**

Name and Address of Applicant:
Lucas County Board of Commissioners
One Government Center, Suite 800
Toledo, Ohio 43604

Name and Address of Facility Where Discharge Occurs:
Lucas County Water Resource Recovery Facility
5758 North River Road
Waterville, Ohio 43566
Lucas County

Receiving Water: **Maumee River**

Subsequent Stream Network: **Lake Erie**

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.

Lower effluent limits are proposed for summer ammonia based on the wasteload allocation results.

Lower effluents are proposed for mercury as the permittee continues to work under a general mercury variance.

Monitoring requirements are proposed to be removed for arsenic, selenium, molybdenum and diethyl phthalate because no reasonable potential is observed.

In accordance with Ohio Administrative Code (OAC) 3745-33-07, it has been determined that the effluent from Lucas County WRRF shows acute and chronic toxicity to *Ceriodaphnia dubia* and *Pimephales promelas*. Limits are proposed to continue.

A 12-month compliance schedule is proposed for the permittee to develop and submit a Phosphorus Optimization Plan. A compliance schedule is also proposed for evaluation of pretreatment local limits in Part I.C of the permit.

Monitoring for *E. coli* at upstream monitoring station 801 and downstream monitoring station 901 is proposed to change from summer to June-August, and from monthly to once every two weeks. The higher frequency over a shorter period will facilitate impairment assessments in the receiving stream.

Water temperature, pH, and dissolved oxygen are being removed from upstream monitoring station 801 because this data is not currently needed as part of the wasteload allocation development.

Dissolved oxygen is being removed from the downstream station 901 because the data is not currently needed as part of the wasteload allocation development.

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; mercury variance; pretreatment program requirements; 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 addressed 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 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 Mr. Michael Donnelly, (419) 373-3070, or Michael.Donnelly@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 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

Lucas County WRRF discharges to Maumee River at River Mile 18.22. Figure 1 shows the approximate location of the facility.

This segment of the Maumee River is described by Ohio EPA River Code: 04-001, Large River Assessment Unit Code: 04100009-90-02, County: Lucas, Ecoregion: Huron-Erie Lake Plain. The Maumee River is designated for the following uses under Ohio's WQS (OAC 3745-1-11): Warmwater Habitat, Agricultural Water Supply, Industrial Water Supply, and 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

Lucas County WRRF was constructed in 1970 and last upgraded in 2019. The average design flow is 22.5 million gallons per day (MGD) and the peak hydraulic capacity is 54.8 MGD. Lucas County WRRF serves the City of Maumee, City of Sylvania, Village of Waterville, Village of Whitehouse, and unincorporated areas of Lucas and Wood Counties, for a total of 107,820 customers. Lucas County WRRF has the following treatment processes which are shown on Figure 2:

- Fine Screening
- Grit Removal
- Primary Clarification
- Conventional Activated Sludge
- Ferrous Chloride Chemical Addition
- Secondary Clarification
- Ultraviolet Disinfection

Lucas County WRRF has one bypass (outfall 002). When influent flow rates exceed the hydraulic peak capacity, excess flow bypasses all treatment processes just prior to the head of the plant and discharges directly

to the receiving stream. Only three bypass occurrences were reported in the last five years. The collection system has 100% separated sewers.

The Lucas County WRRF has an approved pretreatment program. The Lucas County WRRF has 6 categorical users that discharge 0.155 MGD of flow, and 2 non-categorical significant industrial users that discharge 0.250 MGD of flow.

Lucas County WRRF utilizes the following sewage sludge treatment processes (Figure 2):

- Anaerobic Sludge Digestion
- Belt Filter Press Sludge Dewatering
- Centrifuge Sludge Dewatering

Table 1 shows the last five years of sludge removed from Lucas County WRRF. Treated sludge is land applied (station 581), though the permit contains monitoring stations for removal to a landfill (586) or transfer to another NDPES permit holder (588).

DESCRIPTION OF EXISTING DISCHARGE

Table 2 presents effluent violations reported by Lucas County WRRF. The 30 violations for ammonia in 2021 occurred after receipt of external biomass that had to be calibrated to ensure compliance. After noticing the initial violations, Lucas County WRRF had taken steps to resolve the exceedances. These steps include troubleshooting the activated sludge process, adjusting the volume of air sent to the aeration system, adjusting the waste activated sludge and return activated sludge rates, and adjusting the primary sludge pumping cycles.

Table 3 presents the average annual effluent flow rate for Lucas County WRRF for the previous five years Lucas County WRRF estimates there is an infiltration/inflow (I/I) rate to the collection system of 1.5 MGD. Lucas County WRRF and satellite sewer systems perform the following activities to minimize I/I: installation of new storm sewers, video inspection, lining of sanitary sewers, manhole rehabilitation, and rehabilitation of the main interceptor.

Table 4 presents the number of SSOs reported by Lucas County WRRF in the last five years. SSOs are reported at station 300. The increase in overflows reported in 2021 was due to the County reporting overflow occurrences for their satellite communities. The 2021 annual SSO report indicates that the County owned sewers had five overflow events while the rest of the events are attributed to the satellite communities.

Table 5 presents the number of bypasses and dates reported by Lucas County WRRF. Flow bypasses all treatment processes just prior to the head of the plant and discharges directly to the receiving stream. Lucas County WRRF reports bypasses at station 002.

Table 6 presents data characterizing the annual total phosphorus load from Lucas County WRRF during the previous five years.
Table 7 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 8 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period January 2017 to January 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 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 Maumee River Mainstem (Beaver Creek to Maumee Bay) large river assessment unit, which includes the Maumee River in the vicinity of the Lucas County WRRF, is listed as impaired for aquatic life, recreation, human health and public drinking water on Ohio's 303(d) list.

The attainment status of the Maumee River is reported in the *Ohio 2020 Integrated Water Quality Monitoring and Assessment Report.* 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 7-15). 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.

The most recent data for the Maumee River is from 2012 and 2013 and according to the *"Biological and Water Quality Study of the Maumee River and Auglaize River 2012-2013"* the Maumee River is in full attainment for aquatic life and recreational use downstream of the Lucas County WRRF discharge.

There are no public water system intakes downstream of the Lucas County WRRF discharge on the Maumee River. The public water supply impairment in the assessment unit exists above the Lucas County WRRF, therefore the discharge is not contributing to this identified impairment. The river is impaired for human health criteria for polychlorinated biphenyls (PCBs) in fish tissue. PCBs have long been banned but are bioaccumulative chemicals of concern (BCCs) and continue to pose a risk to humans who consume fish. Lucas County WRRF is not believed to be a contributing source of PCB contamination. This information indicates that Lucas County WRRF is not contributing to the impairments and no additional limits are recommended.

At this time, a Total Maximum Daily Load (TMDL) study is in progress for the Maumee River, which will address impairments identified in the Lake Erie Western Basin. Implementation plans in these reports may include recommendations for load reductions through additional permit limits on industrial and municipal dischargers. As of this writing, Ohio EPA has published a final Preliminary Modeling Results and drafting of the TMDL is underway. This information and more about the TMDL process is available through the Ohio EPA, Division of Surface Water website at:
https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/maumee-river-watershed

The use attainment reports can be found at the following websites:

Ohio 2020 Integrated Water Quality Monitoring and Assessment Report: https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/ohio-integrated-water-quality-monitoring-and-assessment-report

"Biological and Water Quality Study of the Maumee River and Auglaize River", Ohio EPA, 2014, https://epa.ohio.gov/static/Portals/35/documents/MaumeeTSD_2014.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 Lucas County WRRF 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)	January 2017 through January 2022
Pretreatment data	2017-2021

Statistical Outliers and Other Non-representative Data

The data were examined, and the following values were removed from the evaluation as non-representative data:

- Zinc – 421 µg/L on 6/8/21; excluded as a high outlier
- Cyanide – 2.7 µg/L, 8/5/18; excluded as a high outlier
- Copper – 84 µg/L, 12/4/19; excluded as a high outlier

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 following dischargers in the Maumee River were considered interactive (see Figure 3):

- Lucas County WRRF
- City of Perrysburg WWTP

These facilities were allocated together for most parameters due to the size of the plant discharges, the flows of the Maumee River and the relatively close proximity of the two plants. The exception was the ammonia-N WLA, which was done separately for each facility because ammonia-N is considered to be a non-conservative parameter.

The available assimilative capacity was distributed among them using the conservative substance wasteload allocation (CONSWLA) water quality model for conservative parameters. CONSWLA is the model Ohio EPA typically uses in multiple discharger situations. CONSWLA model inputs for flow are fixed at their critical low levels and inputs for effluent flow are fixed at their design or 50th percentile levels. Background concentrations are fixed at a representative value (generally a 50th percentile) using available ambient stream data from upstream sampling stations. A mass balancing method is then used to allocate effluent concentrations that

maintain WQS under these conditions. This technique is appropriate when data bases are unavailable to generate statistical distributions for inputs and if the parameters modeled are conservative.

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 Lucas County WRRF, the WLA values are 0.8 TU_a and 1.19 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:

Dilution Ratio (downstream flow to discharger flow)	Allowable Effluent Toxicity (percent effects in 100% effluent)
up to 2 to 1	30
greater than 2 to 1 but less than 2.7 to 1	40
2.7 to 1 to 3.3 to 1	50

$$\text{Stream Dilution Ratio} = \frac{1Q10 + [\text{WWTP flow rate}]}{[\text{WWTP flow rate}]} = \frac{60.1 \text{ cfs} + 34.81 \text{ cfs}}{34.81 \text{ cfs}} = 2.7$$

The acute WLA for Lucas County WRRF is 50 percent mortality in 100 percent effluent based on the dilution ratio of 2.7 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 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 Lucas County WRRF 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, Total Suspended Solids, and 5-Day Carbonaceous Biochemical Oxygen
The limits proposed for dissolved oxygen, total suspended solids, and 5-day carbonaceous biochemical oxygen demand are all based on plant design criteria, which have been effective since the completion of the plant expansion in 2005. The TSS and CBOD5 limits are more stringent than the Secondary Treatment Standards in 40 CFR Part 133. The dissolved oxygen limit is protective of WQS.

Nitrate + Nitrite and Total Kjeldahl Nitrogen
The *Ohio 2020 Integrated Water Quality Monitoring and Assessment Report* lists the Maumee River watershed as impaired for aquatic life. Nutrients and eutrophication are listed as causes, and major municipal point sources are listed among the sources. Considering this information and the fact that municipal WRFs discharge a nutrient load to the river, monthly monitoring for nitrate + nitrite and total Kjeldahl nitrogen is proposed based on best technical judgment. Monitoring for nitrate + nitrite at the upstream and downstream stations also is proposed. The purpose of the monitoring is to maintain a nutrient data set for use in future water quality studies.

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 Maumee River.

Ammonia
The current summer ammonia limits have been evaluated using the WLA procedures and are not protective of WQS. Lower limits based on the WLA are proposed. Ammonia limits are dependent upon downstream temperature and pH values. The 75th percentile of downstream temperature and pH data were calculated from station 901 for of the previous five years (Table 13). Dilution factors and background water quality were also applied to determine the projected effluent limits. A review of the previous five years of data (Table 8) identified a large number of effluent violations associated with a plant upset due to unacclimated biomass. If this period is excluded from consideration, the data indicates that the facility should be able to comply with the lower summer limits, therefore the limits are proposed to become effective immediately.

The current winter ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

Cadmium, Chromium, Hexavalent Chromium, Copper, Free Cyanide, Lead, Nickel, Total Filterable Residue, and Zinc
The Ohio EPA risk assessment (Table 15) places cadmium, chromium, hexavalent chromium, copper, free cyanide, lead, nickel, total filterable residue, and zinc in groups 2 and 3. This placement, as well as the data in Table 8 and Table 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, Dimethyl phthalate, Molybdenum, Selenium, and Silver
The Ohio EPA risk assessment (Table 15) places arsenic, dimethyl phthalate, molybdenum, selenium, and silver in groups 2 and 3. This placement, as well as the data in Table 8 and Table 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 arsenic, dimethyl phthalate, molybdenum and selenium are proposed to be removed. Data submitted as part of the pretreatment program annual report will provide data for future reasonable potential analyses.

Flow Rate and Water Temperature
Monitoring for flow rate and water temperature is proposed to continue in order to evaluate the performance of the treatment plant.

Dissolved Orthophosphate and Total Phosphorus
Phosphorus is limited based on provisions of OAC 3745-33-06(C). Monitoring for dissolved orthophosphate (as P) and total phosphorus 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.

Mercury
The Ohio EPA risk assessment (Table 15) places mercury 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 mercury, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). The thirty-day average concentration limit is based on the mercury variance described below. The daily maximum concentration limit for mercury is based on WQS and is proposed to continue at 1700 ng/l.

The Lucas County WRRF permit was renewed in June 2011 to include a mercury variance, and variance-based limits for mercury. Based on the monitoring results from January 2017 to January 2022, and the new application information, the Lucas County WRRF has determined that the facility will not meet the 30-day average permit limit of 1.3 ng/l. However, the effluent data shows that the permittee can meet the mercury annual average value of 12 ng/l. The permittee's application has also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based upon these demonstrations, the Lucas County WRRF is eligible for the mercury variance under OAC 3745-1-38(H).

Lucas County WRRF submitted information supporting the renewal of the variance. The permittee has implemented a pollutant minimization program to reduce the amount of mercury being discharged. The calculation of the PEQ_{avg} value from 2017 to 2022 compared to the PEQ_{avg} calculated at the time the original variance was issued shows a reduction from 3.9 ng/L to 2.7. The Pollutant Minimization Program (PMP) schedule developed from the original variance continues to be implemented, and further reductions in mercury may be possible.

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the OAC. A condition in Part II of the NPDES permit lists the provisions of the mercury variance, and includes the following requirements:

- A variance-based monthly average effluent limit of 2.7 ng/l, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee make reasonable progress to meet the WQBEL for mercury by implementing the plan of study, which has been developed as part of the PMP;
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/l as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average WQBEL for mercury has not been achieved.

Whole Effluent Toxicity Reasonable Potential
Evaluating the acute and chronic toxicity results in Table 10 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, gives an acute PEQ value of 2.2 TU_a and an chronic PEQ of 40 TU_c for *Ceriodaphnia dubia* and gives an acute PEQ value of 7.0 TU_a and an chronic PEQ of 6.8 TU_c for *Pimephales promelas*. Reasonable potential for toxicity is demonstrated, since these values exceed the WLA values of 0.8 TU_a and 1.7 TU_c. Consistent with Procedure 6 and OAC 3745-33-07(B), a monthly average limit of 1.19 TU_c and a daily maximum limit of 1.0 TU_a are proposed for both species.

Additional Monitoring Requirements
Monitoring for *E. coli* at upstream monitoring station 801 and downstream monitoring station 901 is proposed to change from summer to June-August, and from monthly to once every two weeks. The higher frequency over a shorter period will facilitate impairment assessments in the receiving stream.

Water temperature, pH, and dissolved oxygen are being removed from upstream monitoring station 801 and dissolved oxygen is being removed from the downstream station 901 because the data is not currently needed as part of the reasonable potential analysis.

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
Pretreatment Local Limits Review - A 6-month compliance schedule is proposed for the City to submit a technical justification for either revising its local industrial user limits or retaining its existing local limits. If revisions to local limits are required, the City must also submit a pretreatment program modification request. Details are in Part I.C of the permit.

Phosphorus Optimization - The permittee shall prepare and submit a Phosphorus Discharge Optimization Evaluation plan to Ohio EPA Northwest District Office. The plan shall be completed and submitted to Ohio EPA no later than 12 months from the effective date of this permit. 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 Lucas County WRRF 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.

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 Maumee 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
To comply with industrial storm water regulations, the permittee submitted a form for "No Exposure Certification" which was signed on March 30, 2022. The certification number is 2GR00718*AG. Compliance with the industrial storm water regulations must be re-affirmed every five years. No later than March 29, 2027, the permittee must submit a new form for "No Exposure Certification" or make other provisions to comply with the industrial storm water regulations.

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Figure 1. Location of Lucas County WRRF Discharge

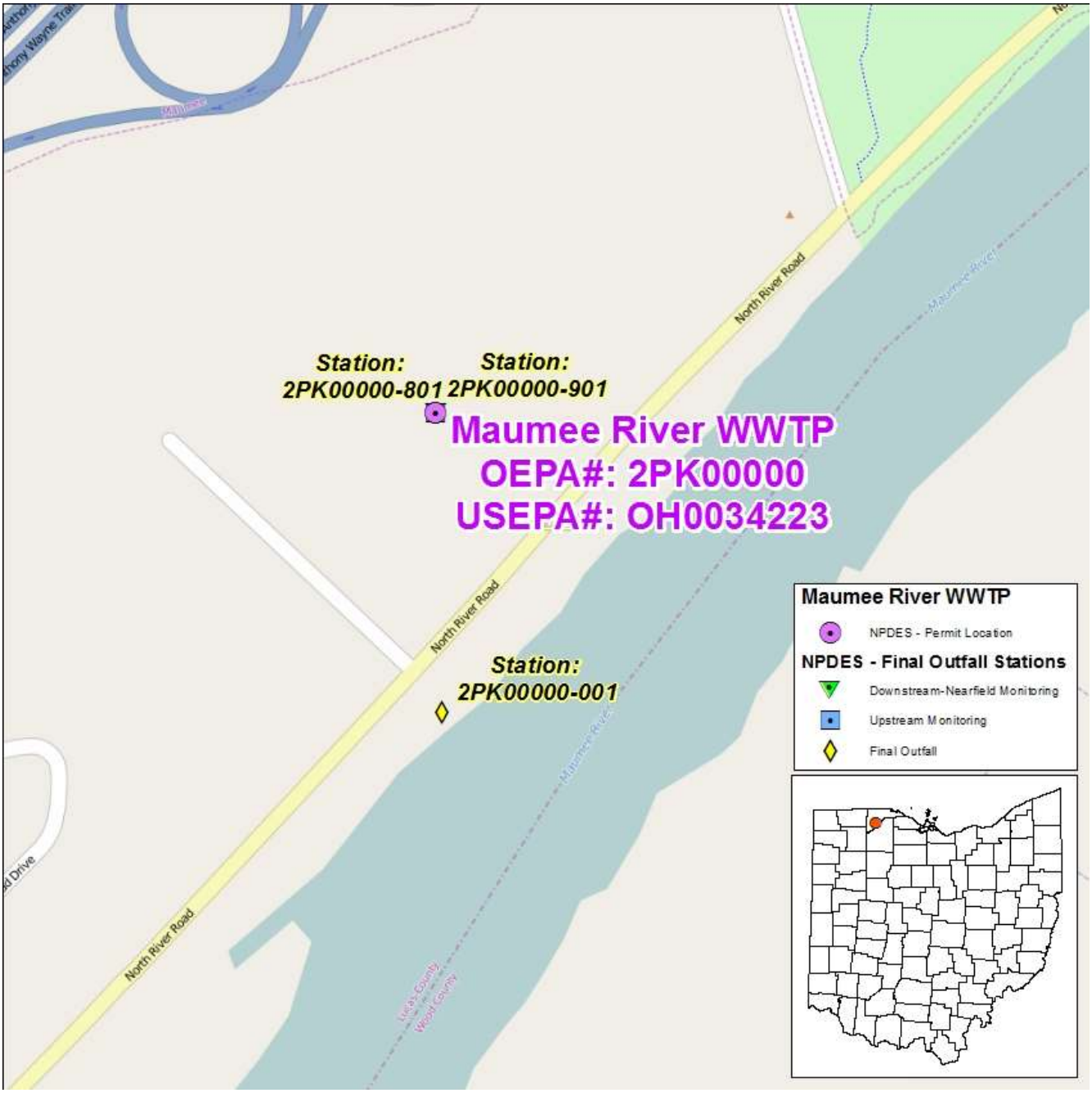


Figure 2. Diagram of Wastewater Treatment System

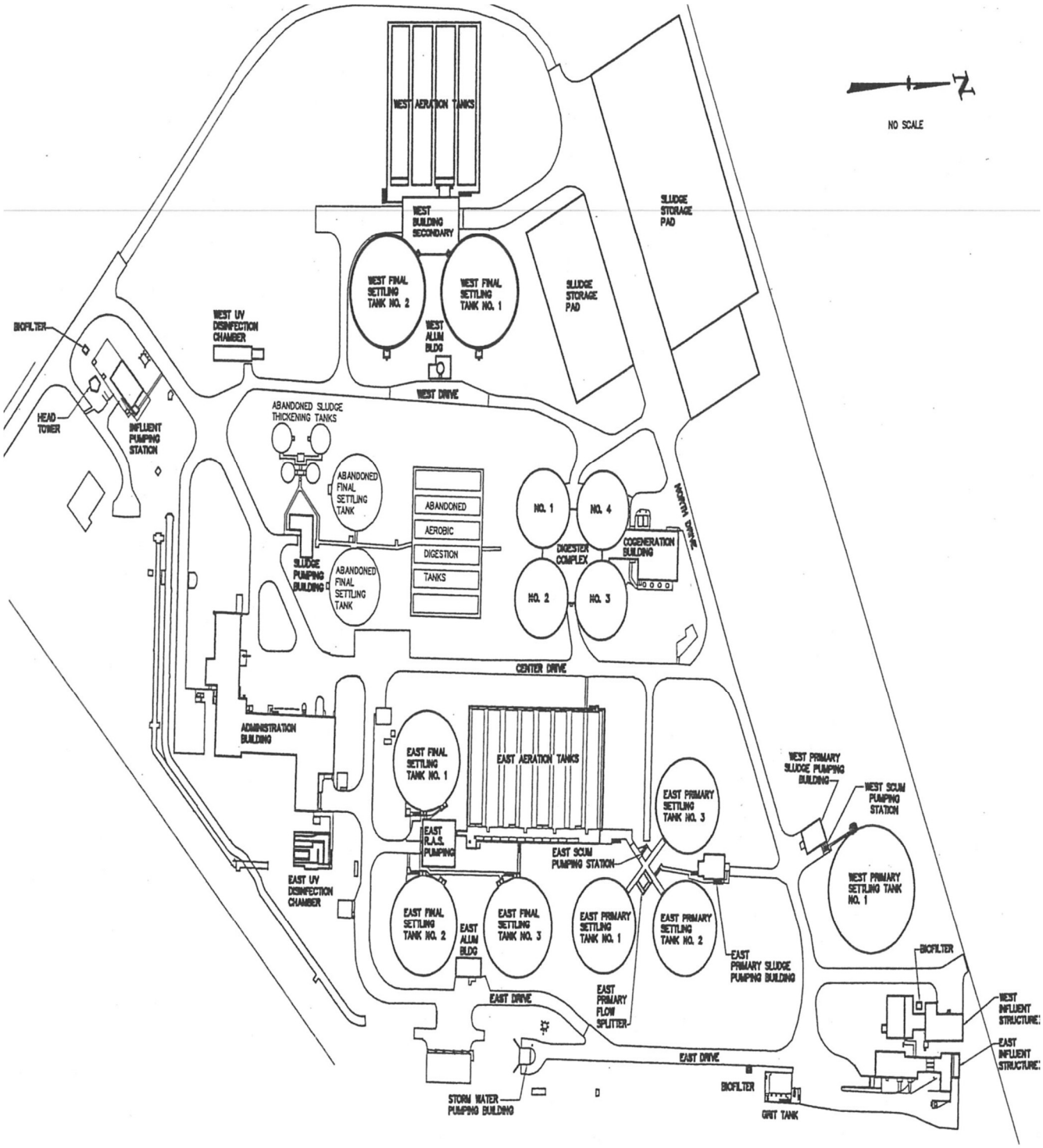
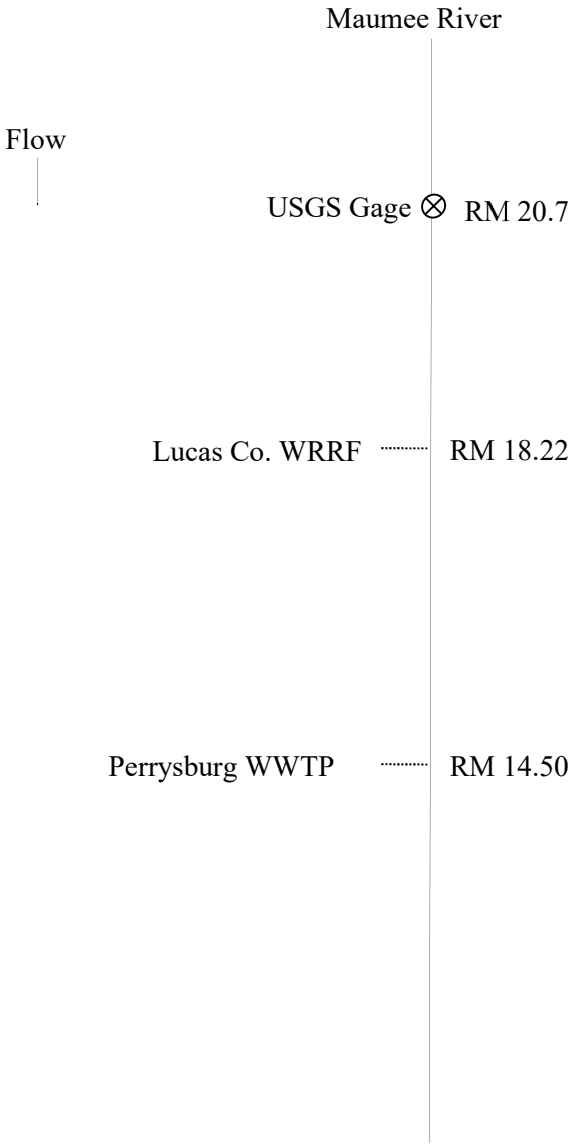


Figure 3. Maumee River Study Area



RM = River Mile
WRRF = Water Resource Recovery Facility
WWTP = Waste Water Treatment Plant
USGS = United States Geological Survey

Table 1. Sewage Sludge Removal

Year	Dry Tons Removed
2017	2640
2018	2680
2019	1930
2020	2790
2021	3080

Table 2. Effluent Violations for Outfall 001

PARAMETER	2017	2018	2019	2020	2021
Acute Toxicity, *C. dubia*	0	1	0	0	0
Acute Toxicity, *P. promelas*	0	1	0	0	0
Chronic Toxicity, *C. dubia*	0	1	1	0	0
Chronic Toxicity, *P. promelas*	0	1	0	0	0
E. coli	5	5	2	0	1
Nitrogen, Ammonia (NH3)	2	0	6	0	30
Phosphorus, Total (P)	0	1	1	0	0
Total Suspended Solids	0	1	2	0	0
Total	**7**	**11**	**12**	**0**	**31**

Table 3. Average Annual Effluent Flow Rates

Flow Rate (Million Gallons per Day)					
Year	# obs	Average	Median	95th Percentile	Maximum
2017	365	15.04	13.98	24.12	35.52
2018	365	15.05	13.78	25.34	36.17
2019	365	17.23	15.99	27.34	34.42
2020	366	14.87	13.56	23.15	38.27
2021	365	16.98	15.67	27.04	35.87

Table 4. Sanitary Sewer Overflow Discharges

Year	Number of SSOs
2017	0
2018	1
2019	0
2020	16
2021	185[a]

[a] Only five SSOs from County-owned sewers were reported, the remainder are from tributary collection systems

Table 5. Bypass Discharges

Outfall	Date	Volume (Millions of Gallons)	Bypass Duration (Hours)	TSS (mg/L)	CBOD (mg/L)
002	5/5/2017	2.7	11	78	51
002	9/22/2021	14.7	13	232	84
002	9/23/2021	15.8	24	70	40
002	9/24/2021	5.1	19	78	35
002	10/25/2021	10.2	17	94	55
002	10/26/2021	9.4	21	76	48

Table 6. Calculated Phosphorus Loadings from 2017 – 2021

Year	Obs.	Median Phosphorus (mg/L)	Median Flow (MGD)	Median Loading (kg/day)
2017	99	0.68	13.98	36.0
2018	102	0.64	13.78	33.4
2019	100	0.68	15.99	41.2
2020	96	0.73	13.56	37.5
2021	97	0.63	15.67	37.4

MGD = million gallons per day

Table 7. Effluent Characterization Using Pretreatment Data

Parameter	Units	4/26/2017	6/5/2018	6/14/2019	7/31/2020	6/9/2021
Arsenic	µg/L	AA (8)	AA (8)	AA (8)	AA (8)	AA (8)
Cadmium	µg/L	AA (1)	AA (1)	AA (1)	AA (1)	AA (1)
Chromium	µg/L	AA (4)	AA (4)	AA (4)	AA (4)	AA (4)
Copper	µg/L	AA (4)	AA (4)	AA (4)	6	5
Diethyl phthalate	µg/L	AA (5)	AA (5)	AA (5)	AA (5)	AA (5)
Lead	µg/L	AA (5)	AA (5)	AA (5)	AA (5)	AA (5)
Mercury	ng/L	AA (200)	AA (200)	AA (200)	AA (200)	AA (200)
Nickel	µg/L	5	8	5	5	7
Selenium	µg/L	AA (8)	AA (8)	AA (8)	AA (8)	AA (8)
Zinc	µg/L	24	20	23	24	41

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	Monitoring Only		1233	16.7	21	11.2 - 22.9
Dissolved Oxygen	mg/L	--	5.3[m]	1233	8.3	6.9*	5.3 - 12.3
Total Suspended Solids	kg/day	2044	3066[w]	956	567	1250	86.5 - 10900
Total Suspended Solids	mg/L	24.0	36.0[w]	956	10	18.9	1.9 - 170
Oil and Grease	mg/L	--	10.0	60	--	--	< 5
Nitrogen, Ammonia - Dec. - Feb.	kg/day	936.9	1405[w]	222	228	795	0 - 1290
Nitrogen, Ammonia - Dec. - Feb.	mg/L	11.0	16.5[w]	222	4	15.8	0 - 22.2
Nitrogen, Ammonia - March-Nov.	kg/day	255.5	383.3[w]	706	52	415	0 - 1290
Nitrogen, Ammonia - March-Nov.	mg/L	3.0	4.5[w]	706	.9	7.12	0 - 19.8
Nitrogen Kjeldahl, Total	mg/L	Monitoring Only		60	< 4	8.93	0 - 19.1
Nitrite Plus Nitrate, Total	mg/L	Monitoring Only		120	17.6	25	7.22 - 29.3
Phosphorus, Total	kg/day	85.2	128[w]	494	37.7	66.6	21.1 - 206
Phosphorus, Total	mg/L	1.0	1.5[w]	494	.66	1.14	.36 - 1.97
Orthophosphate, Dissolved	mg/L	Monitoring Only		60	.3	.629	.15 - 1.51
Arsenic, TR	µg/L	Monitoring Only		20	--	--	< 8
Selenium, TR	µg/L	Monitoring Only		20	--	--	< 8
Nickel, TR	µg/L	Monitoring Only		60	6	10	0 - 11
Zinc, TR	µg/L	Monitoring Only		60	24	56.2	14 - 421
Cadmium, TR	µg/L	Monitoring Only		20	--	--	< 1
Lead, TR	µg/L	Monitoring Only		20	< 5	.6	0 - 12
Chromium, TR	µg/L	Monitoring Only		20	< 4	.2	0 - 4
Copper, TR	µg/L	Monitoring Only		60	5	11	0 - 84
Molybdenum, TR	µg/L	Monitoring Only		20	7	10.1	5 - 11
Chromium, Dissolved Hexavalent	µg/L	Monitoring Only		20	--	--	< 5
E. coli	#/100 mL	126	284[w]	884	60	513	2 - 98000
Diethyl phthalate	µg/L	Monitoring Only		20	--	--	< 5
Flow Rate	MGD	Monitoring Only		1826	14.8	25	9.35 - 38.3
Mercury, Total	kg/day	0.00033	0.14	66	.0000776	.000222	0 - .00068
Mercury, Total	ng/L	3.9	1700	66	1.32	3.93	0 - 6.59

Cyanide, Free (Low-Level)	µg/L	Monitoring Only		61	< .002	.0023	0 - 2.7
Acute Toxicity, Ceriodaphnia dubia	TUa	--	1.0	22	< .2	< .2	0 - 1.3
Chronic Toxicity, Ceriodaphnia dubia	TUc	1.7	--	21	< 1	2.1	0 - 20
Acute Toxicity, Pimephales promelas	TUa	--	1.0	21	< .2	.8	0 - 3.5
Chronic Toxicity, Pimephales promelas	TUc	1.7	--	21	< 1	1.2	0 - 4.26
pH, Maximum	S.U.	--	9.0	1233	7	7.2	6.5 - 7.7
pH, Minimum	S.U.	--	6.5[m]	1233	6.9	6.6*	6.5 - 7.7
Residue, Total Filterable	mg/L	Monitoring Only		60	697	862	566 - 904
CBOD 5 day - Dec. - Feb.	kg/day	1703	2700[w]	161	276	667	0 - 2110
CBOD 5 day - Dec. - Feb.	mg/L	20.0	31.7[w]	161	4.9	9	0 - 17.2
CBOD 5 day - March-Nov.	kg/day	1133	1729[w]	474	203	450	0 - 2990
CBOD 5 day - March-Nov.	mg/L	13.3	20.3[w]	474	3.7	6.27	0 - 40

* = 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
Ammonia (summer)	mg/L	317	196	3.22	7.023
Ammonia (winter)	mg/L	206	189	8.876	20.02
Arsenic – TR [A]	µg/L	24	0	--	--
Cadmium – TR [A]	µg/L	24	0	--	--
Chromium - TR [A]	µg/L	24	1	3.796	5.2
Chromium, Dissolved Hexavalent	µg/L	19	0	--	--
Copper - TR [A]	µg/L	63	42	8.33	11.62
Cyanide - free	µg/L	59	7	0.204	0.232
Diethyl phthalate [A]	µg/L	19	0	--	--
Lead - TR [A]	µg/L	24	1	11.39	15.6
Mercury - TR (BCC) [A]	ng/L	68	61	2.689	4.036
Molybdenum	µg/L	19	19	9.215	11.22
Nickel - TR [A]	µg/L	64	51	8.681	11.62
Nitrate-N + Nitrite-N	mg/L	118	118	23.56	30.11
Nitrogen, Total Kjeldahl	mg/L	59	29	9.132	14.53
Phosphorus	mg/L	486	486	0.862	1.158
Selenium - TR [A]	µg/L	24	0	--	--
Total Filterable Residue	mg/L	59	59	778.3	858.6
Zinc - TR [A]	µg/L	63	63	37.87	50.78

[A] Combined other data sources include Pretreatment Program data.
DMR = Discharge Monitoring Report
MDL = analytical laboratory method detection limit
PEQ = projected effluent quality
TR = total recoverable

Table 10. Summary of Acute and Chronic Toxicity Results

Date	*Ceriodaphnia dubia*		*Pimephales promelas*	
	Acute (Tu_a)	**Chronic (Tu_c)**	**Acute (Tu_a)**	**Chronic (Tu_c)**
3/7/2016	AA (0.2)	AA (1)	AA (0.2)	AA (1)
6/6/2016	AA (0.2)	AA (1)	AA (0.2)	AA (1)
8/1/2016	AA (0.2)	AA (1)	AA (0.2)	AA (1)
12/5/2016	AA (0.2)	AA (1)	AA (0.2)	AA (1)
3/6/2017	AA (0.2)	AA (1)	AA (0.2)	AA (1)
6/5/2017	AA (0.2)	AA (1)	AA (0.2)	AA (1)
8/14/2017	AA (0.2)	AA (1)	AA (0.2)	AA (1)
12/4/2017	AA (0.2)	AA (1)	AA (0.2)	AA (1)
3/5/2018	AA (0.2)	AA (1)	0.25	AA (1)
6/4/2018	1.3	2.1	3.5	4.26
6/18/2018	AA (0.2)	AE ()	AA (0.2)	AA (1.0)
8/13/2018	AA (0.2)	AA (1.0)	0.8	1.2
12/10/2018	AA (0.2)	AA (1)	0.3	AA (1)
3/4/2019	AA (0.2)	AA (1)	AA (0.2)	AA (1)
6/3/2019	AA (0.2)	AA (1)	AA (0.2)	AA (1)
8/12/2019	AA (0.2)	20	0.2	1.12
8/26/2019	AA (0.2)	AA (1)	--	--
12/2/2019	AA (0.2)	AA (1)	AA (0.2)	AA (1)
3/2/2020	AA (0.2)	AA (1)	AA (0.2)	AA (1)
6/1/2020	AA (0.2)	AA (1)	AA (0.2)	AA (1)
8/10/2020	AA (0.2)	AA (1)	AA (0.2)	AA (1)
12/7/2020	AA (0.2)	AA (1)	AA (0.2)	AA (1)
3/1/2021	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
6/7/2021	AA (0.2)	AA (1)	AA (0.2)	AA (1)
8/16/2021	AA (0.2)	AA (1)	AA (0.2)	AA (1)
12/6/2021	AA (0.2)	AA (1)	AA (0.2)	AA (1)

AA = not-detected (analytical method detection limit)
AE = sample collected, not valid

Table 11. Aquatic Life Use Attainment Table

Location	River Mile	Use Designation	Attainment Status	Causes of Impairment	Sources of Impairment
Maumee River at Waterville / SR 64[a]	20.6	WWH	Full	--	--
Maumee River at Buttonwood Park [b]	16.5	WWH	Full	--	--
Maumee River at Maple Street	13.45	WWH	Full	--	--
Downstream of Ewing Island [c]	13.30	WWH	NON	-Nutrient and Eutrophication Biological Indicators -Sedimentation and Siltation -Direct Habitat Alterations -Other Flow Regime Alterations	-Agriculture -Dam or Impoundment -Combined Sewer Overflows -Sanitary Sewer Overflows -Municipal Separate Storm Sewer Systems (MS4) -On-site Treatment Systems -Municipal Point Source Discharges -Dredging
Near Eagle Point Colony [c]	9.40	WWH	NON		
At Toledo, Anthony Wayne Bridge [c]	5.80	WWH	NON		

Data gathered from pages 17 and 18 of *Biological and Water Quality Study of the Maumee River and Auglaize River 2012-2013*
WWH = warmwater habitat
a. Upstream of the Lucas County WRRF discharge
b. Downstream of the Lucas County WRRF discharge
c. These sites were assessed with lacustuary targets and breakpoints: biocriteria are not applicable so attainment status is based on a narrative determination of designated use.

Table 12. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Average				Maximum Aquatic Life	
		Wildlife	Human Health	Agri-culture	Aquatic Life		
Ammonia (summer)	mg/L	--	--	--	0.5	--	--
Ammonia (winter)	mg/L	--	--	--	1.8	--	--
Arsenic - TR	µg/L	--	580	100	150	340	680
Cadmium - TR	µg/L	--	730	50	4.6	11	22
Chromium - TR	µg/L	--	14000	100	160	3400	6900
Chromium, Dissolved Hexavalent	µg/L	--	14000	--	11	16	31
Copper - TR	µg/L	--	64000	500	18	29	59
Cyanide - free	µg/L	--	48000	--	5.2	22	44
Diethyl phthalate	µg/L	--	--	--	220	980	2000
Lead - TR	µg/L	--	--	100	18	330	670
Mercury - TR (BCC)	ng/L	1.3	3.1	10000	910	1700	--
Molybdenum	µg/L	--	10000	--	20000	190000	370000
Nickel - TR	µg/L	--	43000	200	100	910	1800
Nitrate-N + Nitrite-N	mg/L	--	--	100	--	--	--
Selenium - TR	µg/L	--	3100	50	5	62	120
Silver	µg/L	--	11000	--	1.3	6.2	12
Total Filterable Residue	mg/L	--	--	--	1500	--	--
Zinc - TR	µg/L	--	35000	25000	230	230	470

BCC = Bioaccumulative Chemical of Concern
TR = total recoverable

Table 13. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Upstream flows: Maumee R. above Lucas County WRRF				
1Q10	cfs	annual	60.1	USGS gage #04193500, 1940-2021 data
7Q10	cfs	annual	103.2	USGS gage #04193500, 1940-2021 data
30Q10	cfs	summer	155.9	USGS gage #04193500, 1940-2020 data
	cfs	winter	391.8	USGS gage #04193500, 1940-2021 data
90Q10	cfs	annual	216	USGS gage #04193500, 1940-2021 data
Harmonic Mean Flow	cfs	annual	835.6	USGS gage #04193500, 1940-2021 data
Mixing Assumption	%	average	25	Stream-to-discharge ratio
(Maumee R.)	%	maximum	100	Stream-to-discharge ratio
Lucas County WRRF Outfall 001 flow rate	cfs (MGD)	design	34.81 (22.5)	NPDES permit application
Perrysburg WWTP Outfall 001 flow rate	cfs (MGD)	average	12.38 (8.0)	NPDES permit application
Instream Hardness	mg/L	annual	220	DMR (Perrysburg 901); 55 values, 2017-21
Background Water Quality for the Maumee River				
Ammonia (summer)	mg/L	summer	0	DMR, 801; 20 values, 20<MDL, 2017-21
Ammonia (winter)	mg/L	winter	0	DMR, 801; 15 values, 15<MDL, 2017-21
Arsenic	µg/L	annual	2.0	STORET; 84 values, 41<MDL, 2007-15
Cadmium	µg/L	annual	0.05	STORET; 85 values, 79<MDL, 2007-15
Chromium	µg/L	annual	0.5	STORET; 85 values, 67<MDL, 2007-15
Chromium, Dissolved Hexavalent	µg/L	annual	0	No representative data available.
Copper	µg/L	annual	2.9	STORET; 85 values, 17<MDL, 2007-15
Cyanide, free	µg/L	annual	0	No representative data available.
Diethyl phthalate	µg/L	annual	0	No representative data available.
Lead	µg/L	annual	0.5	STORET; 85 values, 63<MDL, 2007-15
Mercury - TR	ng/L	annual	0	No representative data available.
Molybdenum	µg/L	annual	0	No representative data available.
Nickel	µg/L	annual	4	STORET; 85 values,11<MDL, 2007-15
Nitrate-N + Nitrite-N	µg/L	annual	3.4	STORET; 102 values, 21<MDL, 2007-15
Selenium	µg/L	annual	0	STORET; 84 values, 84<MDL, 2007-15
Silver	µg/L	annual	0	No representative data available.
Total Filterable Residue	µg/L	annual	363	STORET; 94 values,0<MDL, 2007-15
Zinc	µg/L	annual	2.5	STORET; 84 values,58<MDL, 2007-15

DMR = Discharge Monitoring Report
MDL = method detection limit
NPDES = National Pollutant Discharge Elimination System
STORET = United States Environmental Protection Agency Storage and Retrieval Data Warehouse, data from stations 500080, 500170
USGS = United States Geological Survey

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

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Average				Maximum Aquatic Life	
		Wildlife	Human Health	Agri Supply	Aquatic Life		
Ammonia (summer)	mg/L	--	--	--	2.74	--	--
Ammonia (winter)	mg/L	--	--	--	22	--	--
Arsenic – TR [B]	µg/L	--	4050 [A]	688 [A]	260	923 [A]	680
Cadmium - TR [B]	µg/L	--	3963 [A]	271 [A]	7.1	25 [A]	22
Chromium - TR [B]	µg/L	--	76002 [A]	541	247	7722 [A]	6900
Chromium, Dissolved Hexavalent	µg/L	--	76005 [A]	--	17	36 [A]	31
Copper - TR	µg/L	--	347437 [A]	2702 [A]	26	62 [A]	59
Cyanide - free [B]	µg/L	--	336193 [A]	--	9.1	60 [A]	44
Diethyl phthalate [B]	µg/L	--	--	--	383	2669 [A]	2000
Lead - TR	µg/L	--	--	541	28	749 [A]	670
Mercury - TR (BCC) [C]	ng/L	1.3	3.1	10000 [A]	910	1700	--
Molybdenum [B]	µg/L	--	70040	--	34823	517492 [A]	370000
Nickel - TR [B]	µg/L	--	233425 [A]	1068	152	2062 [A]	1800
Nitrate-N + Nitrite-N [B]	mg/L	--	--	528	--	--	--
Selenium - TR [B]	µg/L	--	21712 [A]	350 [A]	8.7	169 [A]	120
Silver [B]	µg/L	--	77044 [A]	--	2.3	17	12
Total Filterable Residue	mg/L	--	--	--	2122	--	--
Zinc - TR	µg/L	--	190001 [A]	135712 [A]	354	519 [A]	470

[A] Allocation must not exceed the Inside Mixing Zone Maximum.
[B] Parameter would not require a WLA based on reasonable potential procedures, but allocation requested by permit staff.
[C] Bioaccumulative Chemical of Concern (BCC), WQS must be met at end-of-pipe, unless the requirements for an exclusion are met as listed in 3745-2-05(A)(2)(e)(ii)

Table 15. Parameter Assessment

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

No parameters fit the criteria of this group.

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

Arsenic - TR	Cadmium - TR	Chromium - TR
Chromium, Dissolved Hexavalent	Cyanide, free	Dimethyl phthalate
Molybdenum	Nickel - TR	Nitrate + Nitrite
Selenium - TR	Silver	Zinc - TR

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

Ammonia (winter)	Copper - TR	Lead - TR
Total Filterable Residue		

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

No parameters fit the criteria of this group.

Group 5: Maximum PEQ > 100% of the maximum PEL or average PEQ > 100% of the average PEL,or either the average or maximum PEQ is between 75 and 100% 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	Period	Average	Maximum
Ammonia	mg/L	summer	2.74	--
Mercury	ng/L	annual	1.3	1700

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	5.3[m]				PD
Total Suspended Solids	mg/L	36[d]	24	3066	2044[d]	PD
Oil & Grease	mg/L	10	--	--	--	WQS
Ammonia (Summer)	mg/L	4.1 [d]	2.7	349.3[d]	230.0	WLA
Ammonia (Winter)	mg/L	16.5 [d]	11.0	1405[d]	936.9	PD
Total Kjeldahl Nitrogen	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Nitrate plus Nitrite	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Phosphorus	mg/L	1.5[d]	1.0	128[d]	85.2	PTS
Orthophosphate	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				PMR
Nickel	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Zinc	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Cadmium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Lead	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Chromium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Copper	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Dissolved Hexavalent Chromium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
E. coli	#/100 mL	284 [d]	126	--	--	WQS
Flow Rate	MGD	- - - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Mercury	ng/L	1700	2.7	0.14	0.00023	RP/VAR
Free Cyanide	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Acute Toxicity, *Ceriodaphnia dubia*	TUa	1.0	--	--	--	WET
Chronic Toxicity, *Ceriodaphnia dubia*	TUc	--	1.7	--	--	WET
Acute Toxicity, *Pimephales promelas*	TUa	1.0	--	--	--	WET
Chronic Toxicity, *Pimephales promelas*	TUc	--	1.7	--	--	WET
pH, maximum	SU	9.0	--	--	--	WQS
pH, minimum	SU	6.5[m]	--	--	--	WQS
Total Filterable Residue	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
CBOD5 (March-Nov)	mg/L	20.3[d]	13.3	1729[d]	1133	PD
CBOD5 (Dec-Feb)	mg/L	31.7[d]	20.0	2700[d]	1703	PD

[a] Effluent loadings based on average design discharge flow of 22.5 MGD.

[b] Definitions:

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)
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))
VAR = Mercury variance (OAC 3745-1-38(J))
WET = Requiring water quality-based effluent limits and monitoring requirements for whole effluent toxicity in NPDES permits [40 CFR Part 132, Appendix F, Procedure 6 and OAC 3745-33-07(B)]
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

Attachment 1. Whole Effluent Toxicity Reasonable Potential Analysis

	Water Flea (*Ceriodaphnia dubia*)		Fathead Minnow (*Pimephales promelas*)	
	Acute	**Chronic**	**Acute**	**Chronic**
WLA (TU)	0.8	1.19	0.8	1.19
Total # of Tests	22	21	21	21
Maximum Value (TU)	1.3	20	3.5	4.26
Coefficient of Variation[1] (standard deviation/mean) [Where # tests > 10]	1.7	2.8	2.4	1.1
Multiplying Factors[2]	1.9	2.0	2.0	1.6
PEQ (Maximum Value x Multiplying Factor)	2.2	40	7	6.8
Reasonable Potential Demonstrated? (Yes/No) (Yes if PEQ > WLA)	Yes	Yes	Yes	Yes

[1] 40 CFR Part 132, Appendix F, Paragraph D(3)
[2] 40 CFR Part 132, Appendix F, Table F6-1

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