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 Lima Wastewater Treatment Plant (WWTP)**

Public Notice No.: **182901**
Public Notice Date: **April 28, 2023**
Comment Period Ends: **May 28, 2023**

Ohio EPA Permit No.: **2PE00000*OD**
Application No.: **OH0026069**

Name and Address of Applicant:
City of Lima
50 Town Square
Lima, OH 45804

Name and Address of Facility Where Discharge Occurs:
Lima WWTP
1200 Fort Amanda Road
Lima, OH 45804
Allen County

Receiving Water: **Ottawa River**

Subsequent Stream Network: **Auglaize River to Maumee River to 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.

Technology-based effluent limits (TBELs) for secondary treatment are proposed to be applied at outfall 001, regardless of operating mode.

Internal monitoring station 604 is proposed to be authorized as equivalent to secondary treatment. New TBELs associated with biological treatment by the nitrification towers are proposed to be applied at this station while operating in peak wet weather mode only. New monitoring for discharge duration is also proposed.

A new parameter (Peak Flow Rate) and revised loading limits are proposed to facilitate maximization of treatment capacity during wet weather events.

Lower effluent limits for ammonia in both summer and winter are proposed to be protective of the respective wasteload allocations. A review of recent data suggests that the permittee can comply with the new limits.

Lower effluent monthly average limits for mercury are proposed as the permittee continues to work under the general mercury variance.

New monitoring for total precipitation is proposed to evaluate the performance of the treatment plant.

Limits are proposed to be removed for dissolved hexavalent chromium due to a lack of reasonable potential to exceed the wasteload allocation. Monitoring is proposed to continue.

Annual chronic toxicity monitoring of *Pimephales promelas* 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).

In accordance with Ohio Administrative Code (OAC) 3745-33-07, it has been determined that the effluent from Lima WWTP shows acute and chronic toxicity to *Ceriodaphnia dubia*. Limits of 1.0 TUa and 1.0 TUc are proposed to continue.

At internal monitoring station 603, new monitoring for flow rate is proposed. Monitoring for bypass occurrence, duration, and volume is proposed to be removed.

At influent monitoring station 601, monitoring for bis(2-ethylhexyl) phthalate and selenium is proposed to be removed due to lack of reasonable potential to exceed the WLA at outfall 001.

At upstream monitoring station 801, monitoring for water temperature, dissolved oxygen, and pH are proposed to be removed because this data isn't needed for the reasonable potential analysis.

At downstream monitoring station 901, monitoring for dissolved oxygen is proposed to be removed because this data isn't needed for the reasonable potential analysis. Also, monitoring for dissolved hexavalent chromium is proposed to be removed.

Monitoring for bypass station 057 and CSO station 036 is proposed to be removed due to elimination of these stations by wet weather control projects. Monitoring for TSS and CBOD5 at CSOs 002, 003, 004, 005, and 006 is also proposed to be removed.

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 sent 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: http://epa.ohio.gov/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

Lima WWTP discharges to Ottawa River at River Mile 37.6. Figure 1 shows the approximate location of the facility.

This segment of the Ottawa River is described by Ohio EPA River Code: 04-200, Hydrologic Unit Code: 04100007-03-06, County: Allen, Ecoregion: Eastern Corn Belt Plains. The Ottawa 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

Lima WWTP was constructed in 1930 and last upgraded in 2016. The average design flow is 18.5 million gallons per day (MGD) and the peak hydraulic capacity is 70 MGD. Lima WWTP serves the City of Lima and portions of Allen County, a total population of approximately 47,000. Lima WWTP has the following treatment processes (Figure 2):

- Bar Screening
- Grit Removal
- Primary Sedimentation
- Activated Sludge, Conventional
- Biological Nitrification Towers
- Ferric Chloride, Polymer Addition
- Secondary Clarification
- Chlorination/Dechlorination

The City of Lima is subject a U.S. EPA Consent Decree (Case No. 3:14 CV2551), entered on January 13, 2015. The Consent Decree requires the City to implement its integrated Long Term Control Plan (LTCP) to control wet weather discharges from the collection system and Lima WWTP. The plan proposes to provide treatment to

WWTP peak wet weather flows up to 70 MGD, reduce combined sewer overflows (CSOs) to five events per typical year, and eliminate sanitary sewer overflows (SSOs), to be completed by 2038. In compliance with the plan, the City has recently completed WWTP improvements and construction of the 13-million gallon Simmons Field Storage Tank, which came online in July 2021. The City of Lima has 40% separate sewers and 60% combined sewers in the collection system.

Lima WWTP has two monitoring stations within the facility, stations 603 and 604. Station 604 is located in the effluent pipe of the nitrification towers and Station 603 is located in the secondary effluent pump station that conveys final clarifier effluent flow to the chlorine contact tanks. This design allows the facility to be operated in different modes (Figure 3), depending on the influent flow rate (rate ranges are approximate). Implementation of the following operating strategy, detailed in the *WWTP Flow Maximization Plan* (approved by U.S. EPA on March 2, 2022), will maximize treatment capacity at Lima WWTP during wet weather, which is one of the primary goals of the CSO Control Policy (U.S.EPA; April 11, 1994):

- Dry Weather (< 30 MGD) – With the exception of a "seed flow" of primary effluent to the nitrification towers, all influent flow passes through the activated sludge tanks and nitrification towers, which are operated in series, and is monitored at Outfall 001.
- Wet Weather (30-40 MGD) – all flow passes through the activated sludge tanks. Only 30 MGD of the flow is directed to the nitrification towers. The remaining flow (up to 10 MGD) is directed to the chlorine contact tanks via station 603. The two secondary treatment effluent streams are mixed and disinfected at the chlorine contact tanks, and monitored at Outfall 001.
- Peak Wet Weather (40-70 MGD) – flows are split after primary treatment:
    - A majority of the flow (40 MGD) passes through only the activated sludge tanks and is conveyed to the chlorine contact tanks via station 603.
    - The remaining flow (up to 30 MGD) receives biological treatment via the nitrification towers and is monitored at Station 604.

  The two effluent streams are mixed at the chlorine contact tank and disinfected prior monitoring at Outfall 001.

The biological treatment provided by the nitrification towers when operating in Peak Wet Weather Mode is proposed to be approved as equivalent to secondary treatment. The effluent limits applied at Station 604 are based on performance criteria memorialized in the Consent Order and are more restrictive than the requirements of 40 CFR 133.105. The *Nitrification Tower Performance Report*, which demonstrates the system's ability to comply with the performance criteria, was approved by U.S. EPA on March 2, 2022.

Previous versions of NPDES permit 2PE00000 have included monitoring of a headworks bypass, station 057. This bypass was eliminated in the recent WWTP improvements, therefore station 057 has been removed.

The City of Lima has an approved pretreatment program, which regulates 12 industrial users. This includes 11 categorical users that discharge 0.71 MGD of flow and 4 significant non-categorical users that discharge 0.412 MGD of flow. Potable water comes from the City of Lima's municipal water service, the source for which is groundwater.

Lima WWTP utilizes the following sewage sludge treatment processes (Figure 4):

- Gravity Thickening
- Anaerobic Digestion
- Filter Press Dewatering
- Lime Stabilization

Table 1 shows the last five years of sludge removed from Lima WWTP. Treated sludge is disposed of via land application of exceptional quality biosolids (Station 584) or Class B biosolids (581), hauling to a landfill (586), or transfer to another NPDES permit holder (588).

DESCRIPTION OF EXISTING DISCHARGE

Table 2 presents the effluent violations for Lima WWTP during the previous five years. Several pH violations were the result of a meter calibration issue. Several TSS violations resulted from a malfunction in a nitrification tower distribution arm. Several E. coli violations were caused by lack of sodium hypochlorite when feed lines clogged. In each instance, the issues have been rectified and the violations have not recurred.

Table 3 presents the average annual effluent flow rate for Lima WWTP for the previous five years. Lima WWTP estimates there is an infiltration/inflow (I/I) rate to the collection system of 0.2 MGD. Lima WWTP performs the following activities to minimize I/I: sewer CCTV inspection, cleaning, rehabilitation, lining, and replacement.

Table 4 presents the number of CSOs reported by Lima WWTP during the previous five years. Lima WWTP has 19 known combined sewer overflows (CSOs). CSO 036 has been eliminated and is proposed to be removed.

Table 5 presents data characterizing bypass activity at Lima WWTP for the previous five years. Bypasses were reported at station 603 under the previous permit, which represented flows that received secondary treatment but bypassed the nitrification towers. Increases in volumes observed at this station during the last five years increased considerably as the City initiated implementation of the LTCP and brought the 13-MG storage basin online.

Table 6 presents the number of SSOs reported by Lima WWTP for the previous five years. SSOs are reported at station 300.

Table 7 presents data characterizing the annual total phosphorus load from Lima WWTP during the previous five years.

Table 8 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 9 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period October 2017 through March 2022, and current permit limits are provided for comparison.

Table 10 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 11 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 Lima Reservoir- Ottawa River watershed

assessment unit, which includes the Ottawa River in the vicinity of Lima WWTP, is listed as impaired for aquatic life, recreation, human health, and public drinking water uses 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 Ottawa River in April 2014.

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 12) 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 published data for the Ottawa River is from 2010, which was initially reported in the technical support document (TSD) *Biological and Water Quality Study of the Ottawa River and Principal Tributaries 2010.* The TSD identified aquatic life use impairments due to nutrients, ammonia, low dissolved oxygen, excess algae, and chronic toxicity. Chronic toxicity manifests as a declining number of pollution-sensitive fish species and an increase in the incidence of deformities, eroded fins, lesions, and tumors (DELT) anomalies in the fish community. The likely sources of these impairments include municipal point source discharges, industrial point source discharges, combined sewer overflows, sanitary sewer overflows, and unknown sources.

The 2014 Ottawa River (Lima area) TMDL recommended a phased approach to returning the river to attainment of its designated uses. For Lima WWTP, the major recommendation for Phase 1 is the finalization and implementation of the CSO LTCP. As noted above, the City's LTCP has been approved and implementation is underway. Prior to any additional TMDL recommendations specific to the Ottawa River (Lima area), Ohio EPA will conduct another survey to assess the river's attainment status. If the stream remains impaired, Ohio EPA will complete a new Ottawa River (Lima area) TMDL.

At this time, a Total Maximum Daily Load (TMDL) study is underway for the Maumee River watershed to address shoreline and open water impairments in the Western Basin of Lake Erie caused by cyanobacteria harmful algal blooms. The Ottawa River is tributary to the Maumee River and Lake Erie's Western Basin, therefore nutrient loads from Lima WWTP will be considered in the study. Implementation plans in these reports may include recommendations for load reductions through additional permit limits on industrial and municipal dischargers. As of this writing, the public notice period for the draft Maumee Watershed Nutrient TMDL has been completed and a final version is expected to be proposed this year. This information and more about the TMDL process, as well as the Ottawa River (Lima Area) TMDL, 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 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 *Biological and Water Quality Study of the Ottawa River and Principal Tributaries, 2010* 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 Lima 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 March 2022
Pre-treatment Data	2017-21

Statistical Outliers and Other Non-representative Data

The data were examined and no values were removed from the evaluation. This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points (see Table 10). 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 13).

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 Ottawa River were considered interactive (see Figure 4):

- Lima WWTP
- Husky Lima Refinery
- PCS Nitrogen
- Shawnee #2 WWTP

These facilities were allocated together for most parameters due to the size of the plant discharges, the flows of the Ottawa River, and the relatively close proximity of the facilities. The exception was the ammonia WLA, which was done separately for each facility because ammonia is not considered to be a 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). 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 14, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria. The data used in the WLA are listed in Table 13 and Table 14. The WLA results to maintain all applicable criteria are presented in Table 16.

Dissolved Metals Translators
A dissolved metals translator (DMT) is the factor used to convert a dissolved metal aquatic life criterion to an effective total recoverable aquatic life criterion with which a total recoverable aquatic life allocation can be calculated as required in the NPDES permit process. Currently, a DMT is based on site- or area-specific field data; each field data sample consists of a total recoverable measurement paired with a dissolved metal measurement.

A DMT study was conducted in the Ottawa River in 2013 by HDR on behalf of PCS Nitrogen and the Lima Refinery. This study developed DMTs for chromium, copper, lead, nickel, and zinc. The study was developed and reviewed by the Ohio EPA prior to sampling and the final results were accepted by the Ohio EPA.

Whole Effluent Toxicity Wasteload Allocation
Whole effluent toxicity (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 (i.e. TUa and TUc) by the associated WQS Implementation Rule (OAC 3745-2-09). The translation results in a numeric value of 0.3 TUa and 1.0 TUc. WLAs can then be calculated using these values as if they were water quality criteria.

There are two separate reasonable potential procedures in Ohio - one for the Lake Erie watershed and one for the Ohio River watershed. Dischargers in the Ohio River watershed are assessed using OAC 3745-33-07(B). Dischargers in the Lake Erie watershed are assessed in accordance with the "Great Lakes Water Quality Initiative Implementation Procedures" contained in 40 CFR Part 132, Appendix F, Procedure 6.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TUc) and 7Q10 flow for the average and the acute toxicity unit (TUa) and 1Q10 flow for the maximum. WET WLAs are based on meeting the values of 0.3 TUa and 1.0 TUc downstream of the discharge, and include any available dilution. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. WLAs for acute toxicity are capped at 1.0 TUa unless the discharger demonstrates that an Area-of-Initial-Mixing (AIM) exists under OAC 3745-1-06, or that one of the factors in OAC 3745-33-07(B)(5)-(9) allows a higher TUa limit to be granted. For the purposes of establishing WET limitations, the values of 1.0 TUa and 1.0 TUc are the most restrictive limitations that can be applied in NPDES permits [OAC 3745-33-07(B)(10)].

For Lima 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

$$\text{Downstream Dilution Ratio} = \frac{1Q10 + [\text{WWTP flow rate}]}{[\text{WWTP flow rate}]} = \frac{0.0 \text{ cfs} + 28.62 \text{ cfs}}{28.62 \text{ cfs}} = 1.0$$

The acute WLA for Lima WWTP is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1.0.

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 16. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 10, 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 17.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 18 presents the final effluent limits and monitoring requirements proposed for Lima WWTP outfall 001 and the basis for their recommendation. Table 19 presents the same for internal monitoring Station 604. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Outfall 001

5-day Carbonaceous Oxygen Demand and Total Suspended Solids
The limits for 5-day carbonaceous biochemical oxygen demand (CBOD5) are plant design limits based on a 1988 wasteload allocation model. Limits for total suspended solids (TSS) are plant design limits which represent the solids removal expected for a facility designed to meet the CBOD5 limits. The TSS and CBOD5 limits are more stringent than the Secondary Treatment Standards in 40 CFR Part 133. Limits for TSS and CBOD5 are proposed to be applied at Outfall 001, regardless of operating mode.

Ammonia
The current ammonia limits, for both summer and winter, have been evaluated using the WLA procedures and are not protective of WQS for ammonia toxicity. 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. Dilution factors and background water quality were also applied to determine the projected effluent limits. A review of data from

the last five years suggests that the permittee is able to comply with the proposed limits, therefore limits are proposed to become effective immediately.

Total Residual Chlorine
The existing daily effluent limit for total residual chlorine is proposed to continue as a plant design value which is based on protection of the inside mixing zone maximum (IMZM) and outside mixing zone maximum (OMZM) PELs. The most stringent daily maximum criterion is applied (OMZM) and is to be met anytime chlorine is being utilized for effluent disinfection. The limit has been evaluated using the WLA procedures and determined to be protective of WQS for chlorine toxicity.

The effluent limit for chlorine is less than the quantification level of 0.050 mg/L. However, a pollutant minimization program is not required because the dosing rate of dechlorination chemicals ensures that the water quality-based effluent limit is being met.

Dissolved Oxygen, *E. coli,* Oil & Grease, and pH
Limits proposed for dissolved oxygen, *Escherichia coli,* oil and grease, and pH are based on WQS (OAC 3745-1-35 and 37). Primary contact recreation *E. coli* standards apply to the Ottawa River.

Selenium
Selenium wasteloads have been re-allocated between Lima Refinery and Lima WWTP. Consistent with the existing permit, Lima WWTP's allocation is proposed to be reduced from 5 µg/L to 3 µg/L. The Ohio EPA risk assessment (Table 17) places selenium in group 4. This placement, as well as the data in Tables 9 and 10, support that this parameter does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC 3745-33-07(A)(2).

The 2015 *PCS Nitrogen Ohio, L.P. Selenium and Bromide Study* concluded that bromide concentrations above 5 mg/L appear to bias selenium values produced using U.S. EPA Method 200.8. Consistent with the current permit, a Part II condition is proposed, requiring Lima WWTP to use an analytical method that is not susceptible to bromide interference.

Bis(2-ethylhexyl) Phthalate
The Ohio EPA risk assessment (Table 17) places bis(2-ethylhexyl) phthalate in group 4. This placement, as well as the data in Tables 9 and 10, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC 3745-33-07(A)(2).

Cadmium, Chromium, Copper, Dissolved Hexavalent Chromium, Free Cyanide, Lead, Nickel, Total Filterable Residue, and Zinc
The Ohio EPA risk assessment (Table 17) places these parameters in groups 2 and 3. This placement, as well as the data in Tables 9 and 10, 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. Limits for dissolved hexavalent chromium are proposed to be removed but monitoring will continue once per two weeks.

Arsenic, Bromodichloromethane, Chloroform, Dibromochloromethane, Molybdenum, and Silver
The Ohio EPA risk assessment (Table 17) places these parameters in groups 2 and 3. This placement, as well as the data in Tables 9 and 10, 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. Annual pretreatment priority pollutant scans will provide data for these parameters for future reasonable potential analysis.

Flow Rate, Total Precipitation, and Water Temperature
Continued monitoring for flow rate and water temperature and new monitoring for total precipitation is proposed in order to evaluate the performance of the treatment plant.

Nitrate + Nitrite and Total Kjeldahl Nitrogen
The 2020 *Ohio Integrated Water Quality Monitoring and Assessment Report* (Ohio EPA) lists the Ottawa River watershed as impaired for aquatic life due to nutrients, eutrophication, and dissolved oxygen. Major municipal point sources are listed among the likely 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. The purpose of the monitoring is to maintain a nutrient data set for use in the future studies. Nitrate + nitrite was evaluated using the WLA procedures and does not have reasonable potential to exceed the WLA.

Dissolved Orthophosphate and Total Phosphorus
Phosphorus is limited based on provisions of OAC 3745-33-06(C). Additionally, an evaluation report must be completed and submitted as part of the next NPDES renewal application. Details are in Part II of the permit.

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.

Mercury
The current permit for Lima WWTP includes a mercury variance and variance-based limits for mercury. Based on the monitoring results from October 2017 through March 2022, and the new application information, the Lima WWTP 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 Lima WWTP is eligible for renewal of the mercury variance under OAC 3745-1-38(H).

Lima WWTP submitted information supporting the renewal of the variance. The permittee coordinates with Allen County Solid Waste District and Allen County Homeland Security to collect mercury-containing materials, continues to monitor 19 industries annually, 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 7.6 to 3.5 ng/L. 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 3.5 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.

Additivity of Carcinogens
Bis(2-ethylhexyl) phthalate and chloroform are carcinogens, which require the evaluation of the additive effect of these pollutants. OAC 3745-33-07(A)(8) states that a pollutant may be removed from the consideration of additivity if the PEL for the pollutant is less than the quantification level for that pollutant. For bis(2-ethylhexyl) phthalate, the average PEL (8.4 µg/L) is less than the quantification level (10 µg/L), so this parameter is removed from additivity consideration. As a result, there is no additive effect and carcinogenic additivity is not proposed for inclusion in the permit.

Whole Effluent Toxicity Reasonable Potential
Evaluating the acute and chronic toxicity results for *Ceriodaphnia dubia* in Table 11 and Attachment 1, under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, gives an acute PEQ value of 1.6 TU_a and a chronic PEQ of 2.08 TU_c. Reasonable potential for toxicity is demonstrated, since these values exceed the WLA values of 0.3 TU_a and 1.0 TU_c. Consistent with Procedure 6 and OAC 3745-33-07(B), limits of 1.0 TU_a and 1.0 TU_c are proposed to continue. Quarterly monitoring is proposed to continue.

The acute and chronic toxicity results for *Pimephales promelas* in Table 11 show that there have been no detections of toxicity. Under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, no PEQ values can be calculated. Reasonable potential for toxicity is not demonstrated. While this indicates that the plant's effluent does not currently pose a toxicity problem, annual chronic toxicity testing with the determination of acute endpoints is proposed consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Peak Flow Rate
A new parameter (Peak Flow Rate) and revised loading limits are proposed to facilitate maximization of treatment capacity during wet weather events, based on flexibility afforded to CSO permittees by OAC 3745-33-05(C)(3)(c). See Part II for details.

Internal Monitoring Station 604

CBOD5 and TSS
Limits for CBOD5 and TSS are plant design limits based on performance criteria detailed in Appendices A and C of the City's Consent Decree. The proposed limits are protective of the requirements in 40 CFR 133.105 and is therefore proposed to be approved as equivalent to secondary treatment. Use of this station shall be limited to wet weather events in which influent flow rates exceed the hydraulic capacity of the activated sludge treatment system. Sampling for TSS and CBOD5 shall commence no later than two hours after a discharge has begun to occur at this station (i.e. peak wet weather mode has been initiated). Samples are not required for discharges lasting less than two (2) hours.

Flow Rate and Duration
Monitoring for flow rate and duration is proposed to facilitate evaluation of treatment system performance.

Additional Monitoring Requirements
At internal monitoring station 603, new monitoring for flow rate is proposed. Monitoring for bypass occurrence, duration, and volume is proposed to be removed.

At influent monitoring station 601, monitoring for bis(2-ethylhexyl) phthalate and selenium is proposed to be removed due to lack of reasonable potential to exceed the WLA at outfall 001.

At upstream monitoring station 801, monitoring for water temperature, dissolved oxygen, and pH are proposed to be removed because this data isn't needed for the reasonable potential analysis.

At downstream monitoring station 901, monitoring for dissolved oxygen is proposed to be removed because this data isn't needed for the reasonable potential analysis. Also, monitoring for dissolved hexavalent chromium is proposed to be removed.

Monitoring for bypass station 057 and CSO station 036 is proposed to be removed due to elimination of these stations by wet weather control projects. Monitoring for TSS and CBOD5 at CSOs 002, 003, 004, 005, and 006 is also proposed to be removed.

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 (station 581), removal of exception quality biosolids (584), removal to sanitary landfill (586), or transfer to another facility with an NPDES permit (588).

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.

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 Lima WWTP to have a Class IV wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001. These rules also require the permittee to designate one or more operator of record to oversee the technical operation of the treatment works and sewerage system.

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

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

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

CSO Public Notification
The rule for Public Notification Requirements for Combined Sewer Overflows to the Great Lakes Basin, i.e. 40 CFR 122.38, was finalized by U.S. EPA on December 17, 2017, published in the Federal Register on January 8, 2018, and became effective on Wednesday, February 7, 2018. This rule protects public health by ensuring timely notification to the public and to public health departments, public drinking water facilities, and other potentially affected public entities. This rule applies to CSO dischargers within Ohio's Lake Erie Basin. Under this rule, CSO dischargers are subject to the following requirements:

- The City of Lima's developed a CSO Public Notification Plan which was approved by Ohio EPA on October 19, 2018.
- Implementation of the Public Notification Plan.
- An Annual Report of data pertaining to CSO activity must be published on or prior to May 1 of every year. Ohio EPA and U.S. EPA must be provided with instructions on how to access the Annual Report.

Part II of the permit includes requirements for public notification of CSOs and the posting of an annual CSO report.

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 Ottawa River providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

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

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

Figure 1. Location of Lima WWTP

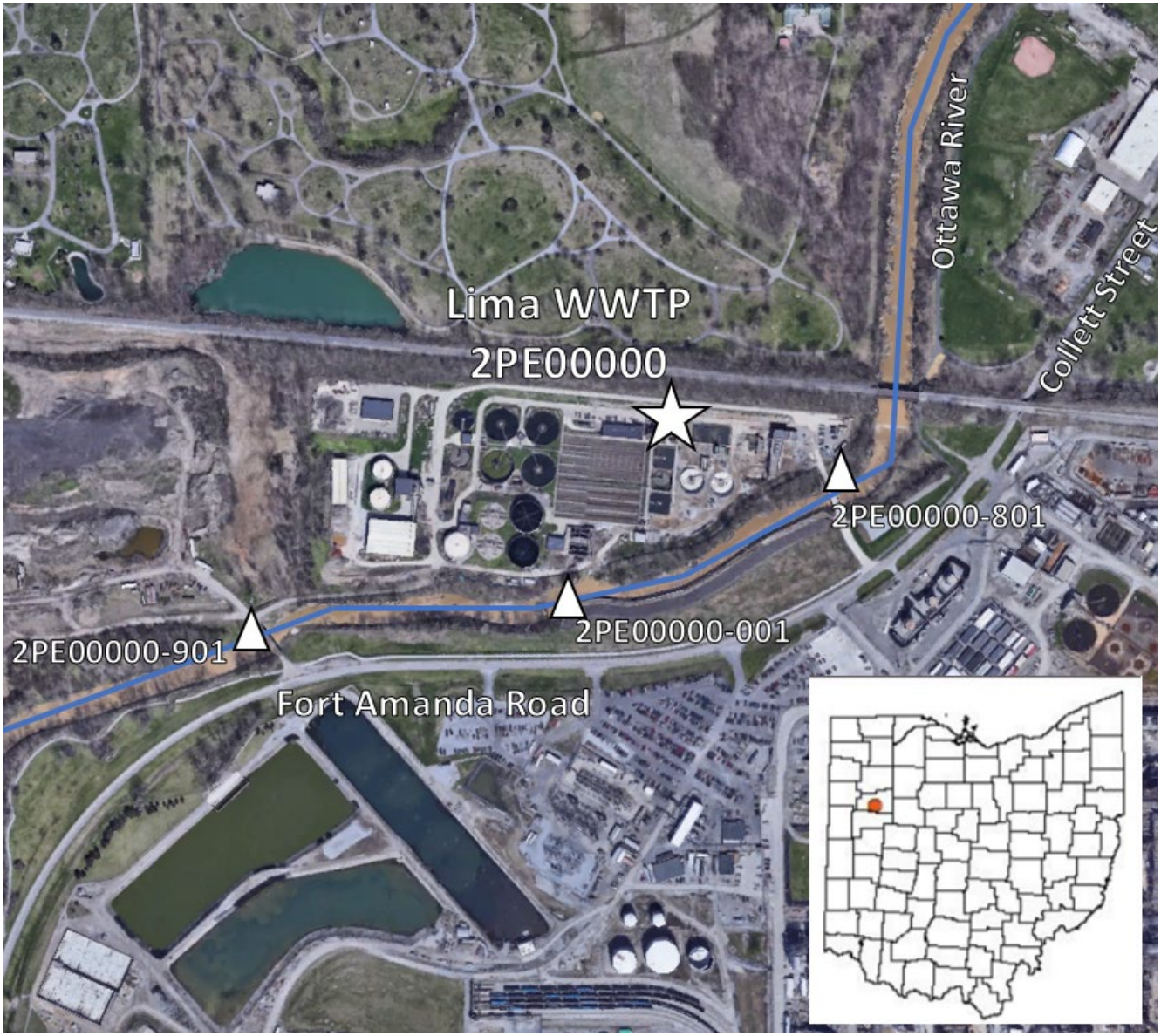

Figure 2. Diagram of Wastewater Treatment System

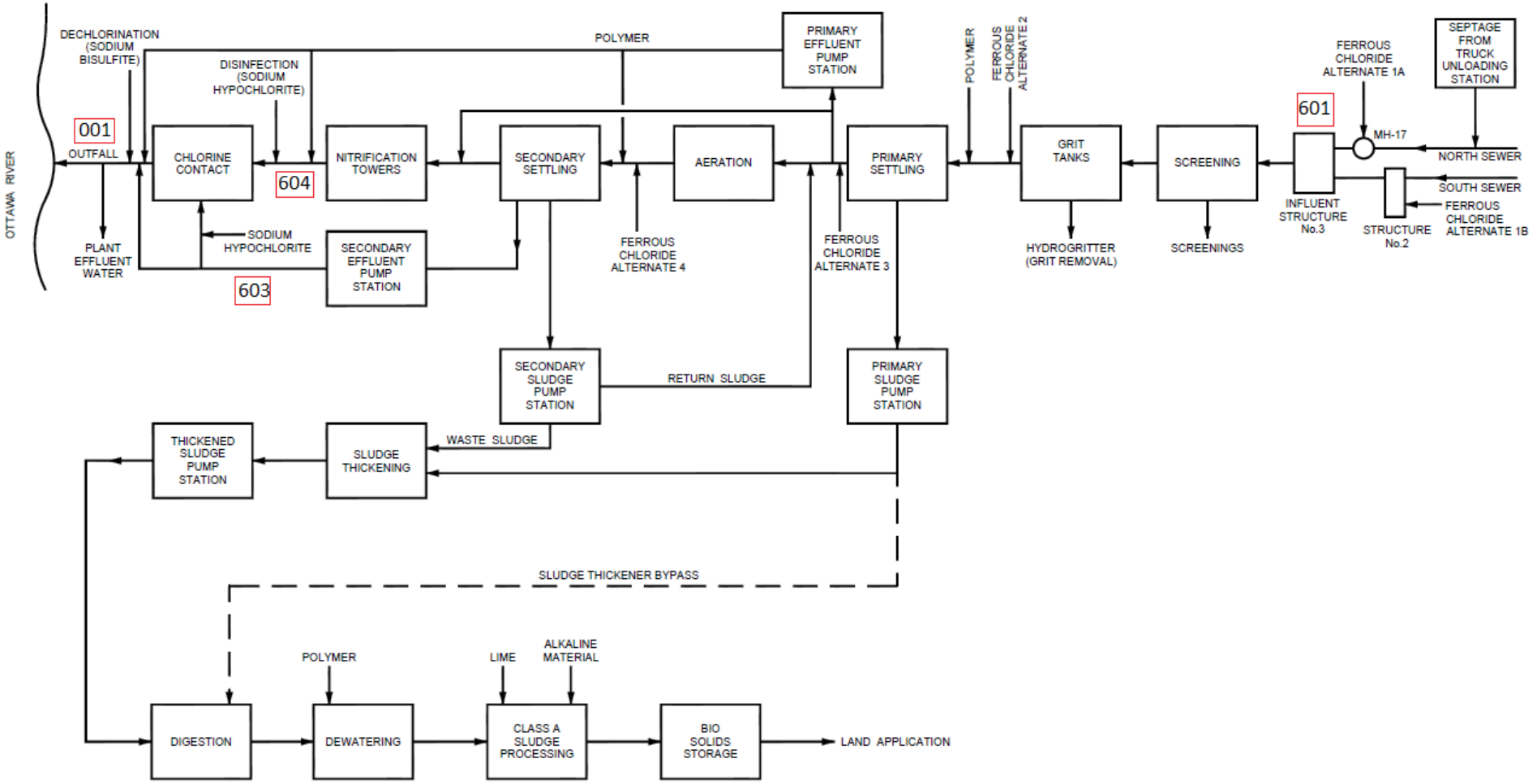

Figure 3. Lima WWTP Operating Modes

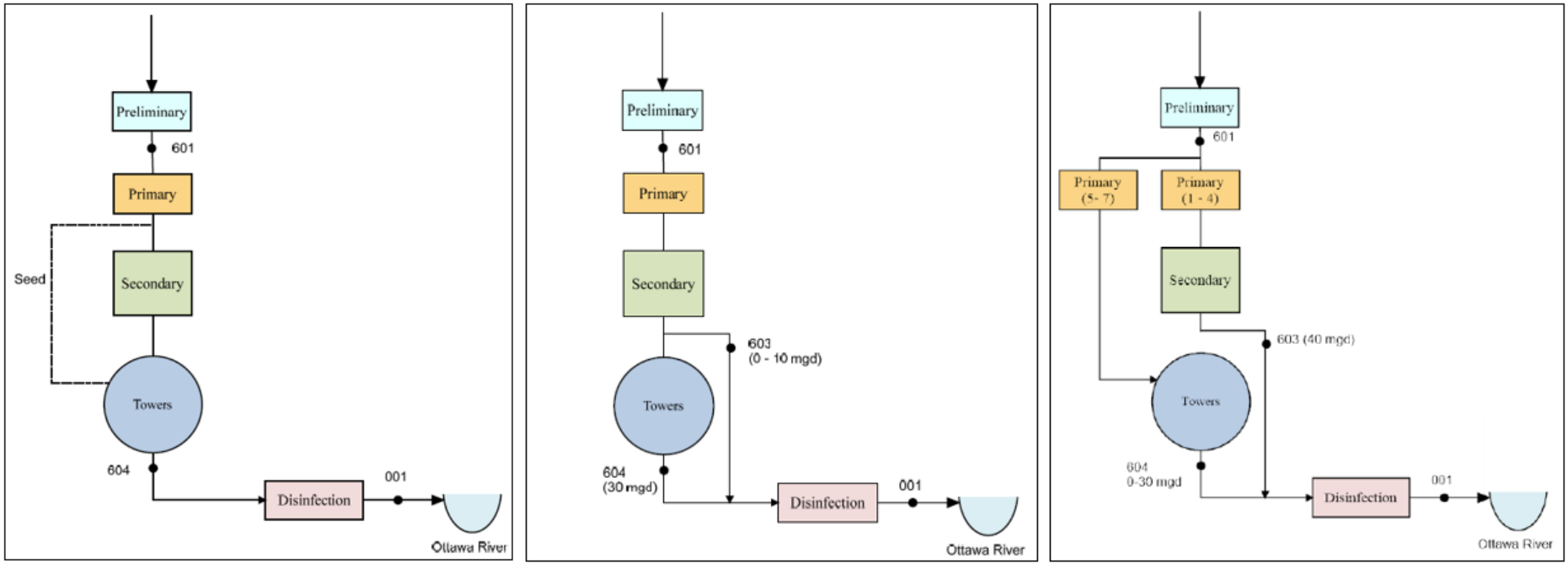

Figure 4. Ottawa River Study Area

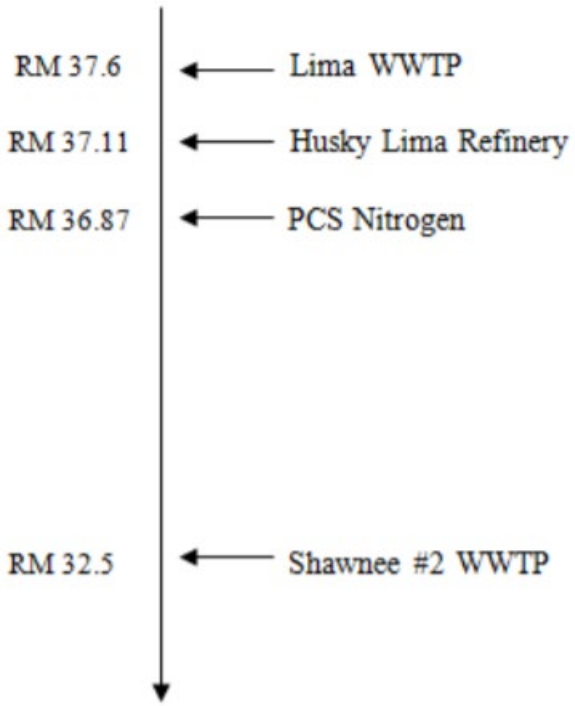

Table 1. Sewage Sludge Removal by Station

Year	581	584	586	588
2017	--	2284.68	442.62	--
2018	--	957.87	5174	--
2019	1928	1109.28	--	--
2020	295.6	1138	--	630.93
2021	--	2586.24	442.62	--

Table 2. Effluent Violations for Outfall 001

Station	Parameter	2017 [a]	2018	2019	2020	2021	2022 [b]	Total
001	*E. coli*	0	1	3	0	2	0	**6**
	Mercury	0	1	0	1	0	0	**2**
	Phosphorus	0	0	0	1	0	0	**1**
	pH, Minimum	0	0	3	1	0	0	**4**
604	Mercury	0	1	0	0	0	0	**1**
	Ammonia	0	3	0	0	0	0	**3**
	Total Suspended Solids	0	1	0	1	0	3	**5**
Total		**0**	**7**	**6**	**4**	**2**	**3**	**22**

[a] Data from October through December only

[b] Data from January through March only

Table 3. Average Annual Effluent Flow Rates

Station	Year	Annual Flow (MGD)		
		50th Percentile	95th Percentile	Maximum
001	2017[a]	11.81	28.36	37.72
	2018	13.97	32.15	38.80
	2019	15.04	36.00	62.60
	2020	8.83	25.20	64.58
	2021	9.96	27.23	63.39
	2022 [b]	13.91	27.88	59.46
604	2017 [a]	11.81	28.11	30.00
	2018	13.97	30.75	38.08
	2019	19.64	35.59	46.88
	2020	8.90	25.77	64.58
	2021	9.96	27.23	63.39
	2022 [b]	13.91	27.88	59.46

[a] Data from October through December only

[b] Data from January through March only

Table 4. Combined Sewer Overflow Discharges

Station	Occurrences						Volume (MG)						Annual Median	
	2017 [a]	2018	2019	2020	2021	2022 [b]	2017 [a]	2018	2019	2020	2021	2022 [b]	TSS (mg/L)	CBOD5 (mg/L)
002	7	54	62	27	19	1	84.8	284.6	482.9	167.0	385.2	51.2	186.5	34.7
003	7	59	62	28	18	1	46.0	215.9	337.8	162.8	97.0	13.9	194.5	45
004	4	36	45	23	14	1	23.7	640.0	398.7	64.4	71.3	2.1	197.6	27.1
005	3	18	30	14	11	1	23.1	41.4	88.2	22.6	48.2	1.5	156.8	23.3
006	2	18	17	12	9	--	7.5	24.5	18.1	6.7	13.7	--	90.4	21.9
007	2	10	22	12	9	1								
008	--	4	11	5	2	--								
009	--	3	1	--	--	--								
011	1	--	2	--	1	--								
012	--	3	2	--	3	--								
013	2	2	3	--	1	--								
014	1	8	3	1	1	--								
015	--	1	4	--	--	--								
016	--	2	3	--	2	--								
033	1	3	5	1	1	--								
034	1	2	3	1	2	1								
035	1	3	4	3	--	--								
036*	--	--	1	--	--	--								
037	--	4	9	5	3	--								
038	1		2		1									

*CSO 036 has been eliminated and is proposed to be removed

Table 5. Bypass Characterization

Station	Parameter	2017 [a]	2018	2019	2020	2021	2022 [b]
603	Occurrences	17	62	108	88	89	28
	Volume	55.3	115.8	687.1	863.9	847	283

*Bypass station 057 had no discharges in the last five years and has been eliminated

[a] Data from October through December only

[b] Data from January through March only

Table 6. Sanitary Sewer Overflow Discharges

Year	Occurrences
2017[a]	46
2018	241
2019	340
2020	208
2021	179
2022[b]	12

[a] Data from October through December only
[b] Data from January through March only

Table 7. Calculated Annual Total Phosphorus Loadings

Year	Median Phosphorus (mg/L)	Median Flow (MGD)	Median Loading (kg/day)
2017[a]	0.40	11.81	17.88
2018	0.34	13.97	18.06
2019	0.36	15.04	20.44
2020	0.40	8.83	13.46
2021	0.27	9.96	10.17
2022[b]	0.15	13.91	7.90

[a] Data from October through December only
[b] Data from January through March only
MGD = million gallons per day

Table 8. Effluent Characterization Using Pretreatment Data

Parameter	Units	9/26/2017	9/5/2018	9/3/2019	9/2/2020	9/1/2021
Arsenic	µg/L	AA (5)	AA (5)	AA (5)	1.0	0.6
Bis(2-ethylhexyl) phthalate	µg/L	AA (5)	AA (5)	AA (5)	AA (1.83)	AA (1.83)
Bromodichloromethane	µg/L	8.6	AA (5)	9.4	23	10
Cadmium	µg/L	AA (3)	AA (3)	AA (3)	AA (0.1)	AA (0.1)
Chloroform	µg/L	21	15.4	18	25	16
Chromium	µg/L	AA (7)	AA (7)	AA (7)	2.0	2.1
Copper	µg/L	AA (8)	AA (8)	AA (8)	6.0	6.3
Dibromochloromethane	ng/L	AA (5)	AA (5)	AA (5)	12	4.1
Lead	µg/L	AA (10)	AA (10)	AA (10)	AA (0.1)	0.4
Molybdenum	µg/L	10	14	12	12	14
Nickel	µg/L	AA (8)	13.2	AA (8)	14	9.0
Selenium	µg/L	AA (4)	AA (3)	AA (3)	AA (3)	0.5
Zinc	µg/L	19	19	12	24	18

AA = not-detected (analytical method detection limit)

Table 9. Effluent Characterization Using Self-Reported Electronic Discharge Monitoring Reports (eDMR)

Outfall	Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
			30 Day	Daily		50th	95th	
001	Water Temperature	°C	-----Monitor-----		1308	14.7	23.8	5.21 - 25.2
	Dissolved Oxygen - 2017-18	mg/L	-----Monitor-----		1308	9.35	7.58*	6.71 - 12.1
	Dissolved Oxygen - 2018-22	mg/L	--	5.0[m]	304	10.5	8.2*	7.8 - 12.8
	Total Suspended Solids	mg/L	-----Monitor-----		304	3.7	9.77	0 - 42.8
	Oil and Grease	mg/L	--	10	171	< 5	< 5	0 - 9.2
	Ammonia - All	mg/L	-----Monitor-----		304	.058	.396	0 - 25.2
	Ammonia (summer)	kg/day	341	681[w]	625	1.36	26.2	0 - 94.6
	Ammonia (summer)	mg/L	2.0	4.0[w]	625	.036	.469	0 - 1.51
	Ammonia (winter)	kg/day	681	1363[w]	618	3.06	69.5	0 - 356
	Ammonia (winter)	mg/L	4.0	8.0[w]	618	.067	1.02	0 - 4.88
	Total Kjeldahl Nitrogen	mg/L	-----Monitor-----		88	< .5	1.55	0 - 3.18
	Nitrite Plus Nitrate	mg/L	-----Monitor-----		87	11.1	18.8	3.38 - 20.8
	Phosphorus	kg/day	341	681[w]	351	14.2	42.3	2.04 - 154
	Phosphorus (2018-22)	mg/L	2.0	4.0[w]	351	.32	.84	.09 - 1.62
	Phosphorus (2017-18)	mg/L	-----Monitor-----		84	.4	1.14	.11 - 1.62
	Orthophosphate	mg/L	-----Monitor-----		43	.136	.69	0 - 1.22
	Nickel	µg/L	-----Monitor-----		45	< 8	12.8	0 - 14
	Zinc	µg/L	-----Monitor-----		45	17	30	0 - 54
	Cadmium	µg/L	-----Monitor-----		45	--	--	< 3
	Lead	µg/L	-----Monitor-----		45	--	--	< 10
	Chromium	µg/L	-----Monitor-----		45	--	--	< 7
	Copper	µg/L	-----Monitor-----		45	< 8	< 8	0 - 12
	Selenium	µg/L	-----Monitor-----		86	< 3	< 3	0 - 3.4
	Chromium, Dissolved Hexavalent	kg/day	1.88	2.73	87	--	--	< .0329
	Chromium, Dissolved Hexavalent	µg/L	11.0	16.0	87	--	--	< 3
	E. coli	#/100 mL	126	284[w]	765	26	694	0 - 60700

Outfall	Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
			30 Day	Daily		50th	95th	
001	Bis(2-ethylhexyl) Phthalate	µg/L	-----Monitor-----		44	< 5	4.34	0 - 76.8
	Flow Rate	MGD	-----Monitor-----		1612	12	32.1	1.89 - 64.6
	Chlorine (2018-21)	mg/L	--	0.019	644	--	--	0 - 0
	Chlorine (2017-18)	mg/L	--	0.020	123	--	--	0 - 0
	Mercury	kg/day	0.000631	0.29	48	.0000452	.000331	0 - .000509
	Mercury	ng/L	3.7	1700	48	1.11	3.92	0 - 10.1
	Free Cyanide	µg/L			44	--	--	< 3
	Acute Toxicity, Ceriodaphnia dubia	TUa	--	1.0	13	< .2	.54	0 - .9
	Chronic Toxicity, Ceriodaphnia dubia	TUc	1.0	--	13	< 1	2.68	0 - 4.3
	Acute Toxicity, Pimephales promelas	TUa	-----Monitor-----		4	--	--	< .2
	Chronic Toxicity, Pimephales promelas	TUc	-----Monitor-----		4	--	--	< 1
	pH, Maximum	S.U.	--	9.0	1609	8	8.4	7.1 - 9
	pH, Minimum	S.U.	--	6.5[m]	1607	7.6	6.9*	5.3 - 8.7
	Residue, Total Filterable	mg/L	-----Monitor-----		47	531	679	279 - 853
	CBOD 5 day	mg/L	-----Monitor-----		292	< 2.2	3.5	0 - 6.6
604	Water Temperature	°C	-----Monitor-----		301	13.9	23.7	0 - 27.4
	Dissolved Oxygen	mg/L	--	5.0[m]	304	10.5	8.2*	7.8 - 12.8
	Total Suspended Solids	kg/day	2385	3407[w]	1329	254	1270	0 - 8140
	Total Suspended Solids	mg/L	14	20[w]	1329	6.2	15.6	0 - 63.2
	Oil and Grease	mg/L	--	10.0	19	--	--	< 5
	Ammonia (summer)	kg/day	341	681[w]	123	3.03	147	0 - 1310
	Ammonia (summer)	mg/L	2.0	4.0[w]	123	.061	2.64	0 - 24.3
	Ammonia (winter)	kg/day	681	1363[w]	181	3.25	15.3	0 - 62.3
	Ammonia (winter)	mg/L	4.0	8.0[w]	181	.051	.187	0 - .619
	Nitrite Plus Nitrate	mg/L	-----Monitor-----		10	12.3	19.2	8.57 - 21.4

Outfall	Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
			30 Day	Daily		50th	95th	
604	Phosphorus	kg/day	170	255[w]	84	21.4	62.4	5.55 - 144
	Phosphorus	mg/L	1.0	1.5[w]	84	.42	1.1	.1 - 1.48
	Free Cyanide	mg/L	-----Monitor-----		10	--	--	< .003
	Nickel	µg/L	-----Monitor-----		10	11	50.9	0 - 51.6
	Zinc	µg/L	-----Monitor-----		10	25	64.5	16 - 69
	Cadmium	µg/L	-----Monitor-----		10	--	--	< 3
	Lead	µg/L	-----Monitor-----		10	--	--	< 10
	Chromium	µg/L	-----Monitor-----		10	--	--	< 7
	Copper	µg/L	-----Monitor-----		10	--	--	< 8
	Selenium	µg/L	-----Monitor-----		10	--	--	< 4
	Chromium, Dissolved Hexavalent	µg/L	-----Monitor-----		10	--	--	< 10
	Antimony, TR	µg/L	-----Monitor-----		10	--	--	< 5
	Bis(2-ethylhexyl) Phthalate	µg/L	-----Monitor-----		10	--	--	< 5
	Flow Rate	MGD	-----Monitor-----		1612	12.7	30.9	.007 - 64.6
	Mercury, Total	kg/day	0.0013	0.29	10	.0000577	.000757	.0000334 - .00122
	Mercury, Total	ng/L	7.6	1700	10	1.22	18.2	.736 - 31.5
	Acute Toxicity, Ceriodaphnia dubia	TUa	-----Monitor-----		3	--	--	< .2
	Chronic Toxicity, Ceriodaphnia dubia	TUc	-----Monitor-----		3	--	--	< 1
	Residue, Total Filterable	mg/L	-----Monitor-----		11	578	827	490 - 913
	CBOD 5 day	kg/day	1192	1703[w]	795	77.5	437	0 - 1880
	CBOD 5 day	mg/L	7.0	10[w]	795	2.3	5.7	0 - 16

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

Table 10. Projected Effluent Quality for Outfall 001

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Self-Monitoring (DMR) Data					
Ammonia (summer)	mg/L	481	293	0.434	0.721
Ammonia (winter)	mg/L	395	268	0.638	1.211
Bis(2-ethylhexyl) phthalate	µg/L	47	2	5.862	8.03
Cadmium	µg/L	49	0	--	--
Chlorine	mg/L	767	0	--	--
Chromium	µg/L	49	2	5.11	7
Copper	µg/L	49	4	8.76	12
Dissolved Hexavalent Chromium	µg/L	85	0	--	--
Free Cyanide	µg/L	43	0	--	--
Lead	µg/L	2	1	1.11	1.52
Mercury (BCC)	ng/L	47	42	3.493	5.617
Nickel	µg/L	49	24	11.14	14.04
Nitrate + Nitrite	mg/L	85	85	16.84	22.84
Phosphorus	mg/L	426	426	0.617	1.024
Selenium	µg/L	84	2	2.234	3.06
Total Filterable Residue	mg/L	42	42	643	776
Total Kjeldahl Nitrogen	mg/L	83	25	1.264	1.971
Zinc	µg/L	49	46	25.46	34.24
Pretreatment Data					
Arsenic	µg/L	5	2	1.679	2.3
Bromodichloromethane	µg/L	5	4	38.62	52.9
Chloroform	µg/L	5	5	41.98	57.5
Dibromochloromethane	µg/L	5	2	20.15	27.6
Molybdenum	µg/L	5	5	23.51	32.2

DMR = Discharge Monitoring Report
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
BCC = bioaccumulative chemical of concern

Table 11. Summary of Acute and Chronic Toxicity Results

	Ceriodaphnia Dubia		*Pimephales promelas*	
Date	**TU_a**	**TU_c**	**TU_a**	**TU_c**
12/17/2017	AA (0.2)	AA (1.0)	--	--
3/13/2018	AA (0.2)	AA (1.0)	--	--
6/25/2018	AA (0.2)	AA (1.0)	--	--
8/28/2018	0.3	4.3	AA (0.2)	AA (1.0)
12/11/2018	AA (0.2)	AA (1.0)	--	--
3/11/2019	AA (0.2)	AA (1.0)	--	--
6/11/2019	AA (1.0)	AA (0.2)	--	--
8/2/2019	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
12/3/2019	0.9	1.6	--	--
1/7/2020	AA (2.0)	AA (1.0)	--	--
1/13/2020	AA (2.0)	AA (1.0)	--	--
1/21/2020	AA (2.0)	AA (1.0)	--	--
3/27/2020	AA (0.2)	AA (1.0)	--	--
6/29/2020	AA (0.2)	AA (1.0)	--	--
8/28/2020	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
12/18/2020	AE	AE	--	--
3/19/2021	AA (0.2)	1.1	--	--
6/7/2021	AA (0.2)	AA (1.0)	--	--
8/13/2021	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
12/11/2021	0.2	AA (1.0)	--	--

AA = non-detection; analytical method detection limit of 0.2 TU_a, 1.0 TU_c
AE = sample taken, not valid
-- = not tested
TU_a = acute toxicity unit
TU_c = chronic toxicity unit

Table 12. Aquatic Life Use Attainment Table

Location	RM	Aquatic Life Use Desig.	Attainment Status	Causes of Impairment	Sources of Impairment
Ottawa at Fetter Rd.	44.3	WWH	FULL		
Ottawa downstream Metzger Dam	43.4	WWH	PARTIAL	Low Flow Alteration, Nutrient/Eutrophication Biological Indicators	Flow Alteration from Water Diversions, Impoundment, Crop Production w/ Subsurface Drainage
Ottawa downstream Roush Rd.	42.5	WWH	PARTIAL	Low Flow Alteration Nutrient/Eutrophication Biological Indicators, DO (Low, Range)	Flow Alteration from Water Diversions, Impoundment, Crop Production w/ Subsurface Drainage
Ottawa at Sugar St.	41.3	WWH	FULL		
Ottawa downstream Lovers Lane Dam	40.1	WWH	PARTIAL	Nutrient/Eutrophication Biol. Indicators, Nutrients DO (Range)	SSOs CSOs
Ottawa downstream Elm St. Dam	39.6	WWH	FULL		
Ottawa downstream Erie RR Dam, Upstream Lima WWTP	37.9	WWH	PARTIAL	Nutrient/Eutrophication Biological Indicators, DO (Range), Organic Enrichment (Sewage) Biological Indicators, Other Anthropomorphic Substrate Alteration	CSOs Impoundment Historic Bottom Deposits
Ottawa downstream Lima WWTP	37.4	WWH	PARTIAL	Nutrient/Eutrophication Biological Indicators, Ammonia	Municipal Point Source Discharge CSOs
Ottawa downstream Husky Refinery	37.0	WWH	NON	Nutrient/Eutrophication Biological Indicators, Ammonia, Excess Algae, Chronic Toxicity (Impairment Unknown)	Municipal Point Source Discharge Industrial Point Source Discharge Source Unknown
Ottawa downstream PCS Nitrogen	36.1	WWH	NON	Nutrient/Eutrophication Biological Indicators, Ammonia, DO (Range), Chronic Toxicity (Impairment Unknown)	Municipal Point Source Discharge Industrial Point Source Discharge Source Unknown
Ottawa adjacent to Westfield Dr. (downstream major dischargers)	34.6	WWH	PARTIAL	Nutrient/Eutrophication Biological Indicators, DO (Minimum, Range), Chronic Toxicity (Impairment Unknown)	Municipal Point Source Discharge Industrial Point Source Discharge Source Unknown
Ottawa at Elm St., downstream Shawnee WWTP	31.1	WWH	PARTIAL	Nutrient/Eutrophication Biological Indicators, DO (Minimum, Range), Organic Enrichment (Sewage) Biological Indicators	SSOs, Municipal Point Source Discharges Industrial Point Source Discharges Urban Runoff/Storm Sewers
Ottawa at Allentown Dam Pool	28.9	WWH	PARTIAL	Nutrient/Eutrophication Biological Indicators, Fish-Passage Barriers	SSOs Municipal Point Discharge Impoundment
Ottawa at Piquad Rd.	25.8	WWH	FULL		

Data gathered from *Biological and Water Quality Study of the Ottawa River and Principal Tributaries, 2010*
RM = River mile
WWH = warmwater habitat

Table 13. 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		
Aluminum	µg/L	--	4500	--	--	--	--
Ammonia (Summer)	mg/L	--	--	--	1.5	--	--
Ammonia (Winter)	mg/L	--	--	--	1.5	--	--
Arsenic	µg/L	--	580	100	150	340	680
Barium	µg/L	--	160000	--	1600 [A]	7000 [A]	14000 [A]
Bis(2-ethylhexyl) phthalate [C]	µg/L	--	32	--	8.4 [A]	1100 [A]	2100 [A]
Boron	µg/L	--	200000	--	3900 [A]	33000 [A]	65000 [A]
Bromodichloromethane [C]	µg/L	--	180	--	340	3100	6200
Cadmium	µg/L	--	730	50	5.8	15	31
Carbon disulfide	µg/L	--	--	--	15	130	260
Chlorides	mg/L	--	--	--	--	--	--
Chlorine	mg/L	--	--	--	0.011	0.019	0.038
Chloroform [C]	µg/L	--	1700	--	140 [A]	1300 [A]	2600 [A]
Chromium	µg/L	--	14000	100	310 [F]	2400 [F]	4700 [F]
Copper	µg/L	--	64000	500	27 [F]	44 [F]	88 [F]
Dissolved Hexavalent Chromium	µg/L	--	14000	--	11	16	31
Free Cyanide	µg/L	--	48000	--	5.2	22	44
Dibromochloromethane [C]	µg/L	--	150	--	320 [E]	2900 [E]	5800 [E]
Fluoride	mg/L	--	--	2	--	--	--
Iron	µg/L	--	--	5000	--	--	--
Lead	µg/L	--	--	100	50 [F]	960 [F]	1900 [F]
Magnesium	mg/L	--	--	--	--	--	--
Manganese	µg/L	--	61000	--	--	--	--
Mercury [D]	ng/L	1.3	3.1	10000	910	1700	--
Molybdenum	µg/L	--	10000	--	20000 [A]	190000 [A]	370000 [A]
Nickel	µg/L	--	43000	200	130 [F]	1200 [F]	2400 [F]
Nitrate + Nitrite	mg/L	--	--	100	--	--	--
Phenol	µg/L	--	2400	--	400	4700	9400
Phenolics	µg/L	--	--	--	--	--	--
Selenium	µg/L	--	3100	50	5	62	120
Silver	µg/L	--	11000	--	1.3	10	21
Strontium	µg/L	--	1400000	--	85000	220000	450000
Sulfates	mg/L	--	--	--	--	--	--
Sulfide	mg/L	--	--	--	--	--	--
Total Kjeldahl Nitrogen	mg/L	--	--	--	--	--	--
Total Filterable Residue	mg/L	--	--	--	1500	--	--
Urea	mg/L	--	--	--	17 [A]	150 [A]	300 [A]

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Average				Maximum Aquatic Life	
		Wildlife	Human Health	Agri-culture	Aquatic Life		
Aluminum	µg/L	--	4500	--	--	--	--
Vanadium	µg/L	--	--	--	44	150	300
Xylenes	µg/L	--	83000	--	27	240	480
Zinc	µg/L	--	35000	25000	330 [F]	330 [F]	660 [F]

[A] Tier II
[B] Human Health and Aquatic Life criteria are Tier I unless otherwise indicated.
[C] Carcinogen
[D] Bioaccumulative Chemical of Concern (BCC)
[E] Screening value
[F] Aquatic Life Criteria are Total Effective Criteria; Dissolved Metals Criteria with Translator Applied

Table 14. Instream Conditions and Discharger Flow

Parameter	Units		Value	Basis
Upstream flows:				
Ottawa R. above Lima WWTP				
1Q10	cfs	annual	0.0	USGS gage #04187100, 1989-2021 data
7Q10	cfs	annual	0.2	USGS gage #04187100, 1989-2021 data
30Q10	cfs	summer	1.6	USGS gage #04187100, 1989-2021 data
	cfs	winter	4.4	USGS gage #04187100, 1989-2021 data
90Q10	cfs	annual	4.6	USGS gage #04187100, 1988-2021 data
Harmonic Mean Flow	cfs	annual	4.8	USGS gage #04187100, 1988-2021 data
Mixing Assumption	%	average	25	Stream-to-discharge ratio
	%	maximum	100	Stream-to-discharge ratio
Discharger Flows:				
Lima Refining				
Outfall 001	cfs (MGD)	design	8.09 (5.23)	NPDES permit application
Outfall 011	cfs (MGD)	tiered	4.64 (3.0)	NPDES permit application
Outfall 012	cfs (MGD)	tiered	1.55 (1.0)	NPDES permit application
Outfall 013	cfs (MGD)	tiered	2.32 (1.5)	NPDES permit application
Outfall 014	cfs (MGD)	tiered	3.10 (2.0)	NPDES permit application
Outfall 015	cfs (MGD)	tiered	4.64 (3.0)	NPDES permit application
Outfall 016	cfs (MGD)	tiered	7.74 (5.0)	NPDES permit application
Lima WWTP				
Outfall 001	cfs (MGD)	average	28.62(18.5)	NPDES permit application
PCS Nitrogen				
Outfall 001	cfs (MGD)	average	6.14 (3.97)	NPDES permit application
Shawnee #2 WWTP				
Outfall 001	cfs (MGD)	average	3.10 (2.0)	NPDES permit application
Instream Hardness	mg/L	annual	295	DMR (Lima 901); n=52, 2017-2022
Instream Temperature	°C	summer	23.2	DMR (Lima 901); n=16, 2017-2022
	°C	winter	3.95	DMR (Lima 901); n=14, 2017-2022
Instream pH	S.U.	summer	7.8	DMR (Lima 901); n=16, 2017-2022
	S.U.	winter	8.4	DMR (Lima 901); n=14, 2017-2022
Dissolved Metals Translators				
Chromium	µg/L		1.71	Lima Ref./PCS Study, n=10, 2013
Copper	µg/L		1.18	Lima Ref./PCS Study, n=10, 2013
Lead	µg/L		2.05	Lima Ref./PCS Study, n=10, 2013
Nickel	µg/L		1.02	Lima Ref./PCS Study, n=10, 2013
Zinc	µg/L		1.13	Lima Ref./PCS Study, n=10, 2013

DMR = Discharge Monitoring Report
NPDES = National Pollutant Discharge Elimination System
n = number of observations

Table 15. Background Water Quality for the Ottawa River

Parameter	Units	Season	Value	Basis
Ammonia	mg/L	summer	0.12	Lima DMR, 801; n=16, 0<MDL, 2017-22
Ammonia	mg/L	winter	0.038	Lima DMR, 801; n=14, 0<MDL, 2017-22
Arsenic	µg/L	annual	2.1	STORET; n=49, 13<MDL, 2010-11
Barium	µg/L	annual	47	STORET; n=47, 0<MDL, 2010-11
Bis(2-ethylhexyl) Phthalate	µg/L	annual	0	STORET; n=2, 2<MDL, 2010-11
Boron	µg/L	annual	0	No representative data available.
Cadmium	µg/L	annual	0	STORET; n=48, 0<MDL, 2010-11
Carbon disulfide	µg/L	annual	0	No representative data available.
Chlorine	mg/L	annual	0	No representative data available.
Chloroform	µg/L	annual	0	STORET; n=2, 0<MDL, 2010
Chromium	µg/L	annual	0	STORET; n=48, 0<MDL, 2010-11
Dissolved Hexavalent Chromium	µg/L	annual	0	No representative data available.
Copper	µg/L	annual	2.45	STORET; n=46, 3<MDL, 2010-11
Free Cyanide	µg/L	annual	0	No representative data available.
Fluoride	mg/L	annual	0	No representative data available.
Iron	µg/L	annual	426	STORET; n=47, 0 <MDL, 2010-11
Lead	µg/L	annual	1.0	STORET; n=47, 46 <MDL, 2010-11
Manganese	µg/L	annual	56	STORET; n=47, 0 <MDL, 2010-11
Molybdenum	µg/L	annual	0	No representative data available.
Nickel	µg/L	annual	4.6	STORET; n=47, 0 <MDL, 2010-11
Nitrate + Nitrite	mg/L	annual	2.53	Lima DMR, 801; n=53, 3<MDL, 2017-22
Phenol	µg/L	annual	0	No representative data available.
Selenium	µg/L	annual	1.0	STORET; n=47, 44 <MDL, 2010-11
Silver	µg/L	annual	0	No representative data available.
Strontium	µg/L	annual	1820	STORET; n=47, 0 <MDL, 2010-11
Total Filterable Residue	mg/L	annual	491	STORET; n=54, 0 <MDL, 2010-11
Urea	µg/L	annual	0	No representative data available.
Vanadium	µg/L	annual	0	No representative data available.
Xylene	µg/L	annual	0	No representative data available.
Zinc	µg/L	annual	5.0	STORET; n=47, 37 <MDL, 2010-11

DMR = Discharge Monitoring Report
n = number of observations
STORET = United States Environmental Protection Agency Storage and Retrieval Data Warehouse, stations P04P19, P04S14, P04S24, 301610, P04W08, P04K03, and P04K04

Table 16. 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-culture	Aquatic Life		
Ammonia (Summer)	mg/L	--	--	--	1.6	--	--
Ammonia (Winter)	mg/L	--	--	--	1.7	--	--
Arsenic [B]	µg/L	--	604 [A]	104	150	340	680
Bis(2-ethylhexyl) phthalate	µg/L	--	33.33	--	8.4	1100	2100
Cadmium [B]	µg/L	--	760 [A]	52	5.8	15	31
Chloroform	µg/L	--	1771	--	140	1300	2600
Chromium [B]	µg/L	--	14363 [A]	102	310	2400	4700
Dissolved Hexavalent Chromium [B]	µg/L	--	14454 [A]	--	11	16	31
Copper	µg/L	--	65658 [A]	513 [A]	27	44	88
Free Cyanide [B]	µg/L	--	49243 [A]	--	5.2	22	44
Lead [B]	µg/L	--	--	103	50	960	1900
Mercury [C]	ng/L	1.3	3.1	10000 [A]	910	1700	--
Molybdenum [B]	µg/L	--	10416	--	20035	190000	370000
Nickel [B]	µg/L	--	44394 [A]	206	130	1200	2400
Nitrate + Nitrite [B]	mg/L	--	--	104	--	--	--
Selenium	µg/L	--	3186 [A]	51	3.0 [D]	62	120
Silver [B]	µg/L	--	11457 [A]	--	1.3	10	21
Total Filterable Residue	mg/L	--	--	--	1403	--	--
Zinc [B]	µg/L	--	36455 [A]	26039 [A]	331	330	660

[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); 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)
[D] Wasteload allocation fixed at this value, see discussion on page 15.

Table 17. Parameter Assessment

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

No parameters fit this category

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

Arsenic	Bromodichloromethane	Cadmium
Chlorine	Chromium	Dissolved Hexavalent Chromium
Free Cyanide	Dibromochloromethane	Lead
Molybdenum	Nickel	Nitrate + Nitrite
Silver	Zinc	

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

Chloroform	Copper	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.

Bis(2-ethylhexyl) phthalate	Selenium

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.

			Recommended Effluent Limits	
Parameter	Units	Period	Average	Maximum
Ammonia (summer)	mg/L	annual	1.6	--
Ammonia (winter)	mg/L	annual	1.7	--
Mercury - TR (BCC)	ng/L	annual	1.3	1700

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

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

Table 18. 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]
Total Precipitation	inches	- - - - - - - - - - Monitor - - - - - - - - - -				M[c]
Dissolved Oxygen	mg/L	5.0[m]	--	--	--	WQS
Total Suspended Solids	mg/L	20 [d]	14	1402 [d]	982	PD
Oil & Grease	mg/L	10	--	--	--	WQS
Ammonia (summer)	mg/L	2.4 [d]	1.6	168 [d]	112	WLA
Ammonia (winter)	mg/L	2.6 [d]	1.7	182[d]	119	WLA
Total Kjeldahl Nitrogen	mg/L	- - - - - - - - - - Monitor - - - - - - - - - -				M
Nitrate plus Nitrite	mg/L	- - - - - - - - - - Monitor - - - - - - - - - -				M
Phosphorus	mg/L	1.5 [d]	1.0	105 [d]	70	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
Bis(2-ethylhexyl) Phthalate	µg/L	- - - - - - - - - - Monitor - - - - - - - - - -				RP
Flow Rate	MGD	- - - - - - - - - - Monitor - - - - - - - - - -				M[c]
Chlorine	mg/L	0.019	--	--	--	PD/WLA
Mercury	ng/L	1700	3.5	0.12	0.00025	RP/VAR
Free Cyanide	µg/L	- - - - - - - - - - Monitor - - - - - - - - - -				M
Acute Toxicity, *Ceriodaphnia dubia*	TUa	1.0	--	--	--	WET1
Chronic Toxicity, *Ceriodaphnia dubia*	TUc	--	1.0	--	--	WET1
Acute Toxicity, *Pimephales promelas*	TUa	- - - - - - - - - - Monitor - - - - - - - - - -				WET2
Chronic Toxicity, *Pimephales promelas*	TUc	- - - - - - - - - - Monitor - - - - - - - - - -				WET2
pH, maximum	SU	9.0	--	--	--	WQS
pH, minimum	SU	6.5[m]	--	--	--	WQS
Total Filterable Residue	mg/L	- - - - - - - - - - Monitor - - - - - - - - - -				M
CBOD5	mg/L	10 [d]	7.0	701 [d]	491	PD

[a] Effluent loadings are based the average daily design flow is 18.5 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)
PD = Plant Design (OAC 3745-33-05(E))
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))
WET1 = 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)]
WET2 = 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

Table 19. Final Effluent Limits for Internal Monitoring Station 604

Parameter	Units	Concentration		Loading (kg/day)[a]		Basis[b]
		Daily Maximum	30 Day Average	Daily Maximum	30 Day Average	
Total Suspended Solids	mg/L	65	45	--	--	PD
Flow Rate	MGD	- - - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
CBOD5	mg/L	65	45	--	--	PD

[b] Definitions: PD = Plant Design (OAC 3745-33-05(E))
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges

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

Attachment 1. Whole Effluent Toxicity Reasonable Potential Analysis

	Water Flea (*Ceriodaphnia dubia*)		Fathead Minnow (*Pimephales promelas*)	
	Acute	**Chronic**	**Acute**	**Chronic**
WLA (TU)	0.3	1.0	0.3	1.0
Total # of Tests	19	18[1]	4	4
Maximum Value (TU)	0.9	1.6	AA	AA
Coefficient of Variation[2] (standard deviation/mean) [Where # tests > 10]	1.18	0.52	--	--
Multiplying Factors[3]	1.8	1.7	--	--
PEQ (Maximum Value x Multiplying Factor)	1.6	2.08	--	--
Reasonable Potential Demonstrated? (Yes/No) (Yes if PEQ > WLA)	Yes	Yes	No	No

[1] The City received hauled waste following an emergency at a commercial facility in mid-2018. This caused an upset of the treatment system, causing several effluent violations. In response, the City has halted receipt of hauled industrial wastewater and increased monitoring of received loads. The high toxicity value of 4.3 TUc on 8/28/2018 is likely a result of this upset and is therefore excluded from the reasonable potential analysis.

[2] 40 CFR Part 132, Appendix F, Procedure 6, Paragraph D

[3] 40 CFR Part 132, Appendix F, Table F6-1

Attachment 2. 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