National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
For **O'Bannon Creek Regional Wastewater Treatment Plant (WWTP)**

Public Notice No.: 15-02-046
Public Notice Date: February 26, 2015
Comment Period Ends: March 27, 2015

Ohio EPA Permit No.: **1PK00017*LD**
Application No.: **OH0048089**

Name and Address of Applicant:
Clermont County Board of Commissioners
4400 Haskell Lane
Batavia, OH 45103

Name and Address of Facility Where Discharge Occurs:
O'Bannon Creek Regional WWTP
1270 Neale Lane
Loveland, OH 45140
Clermont County

Receiving Water: O'Bannon Creek

Subsequent Stream Network: Little Miami River, Ohio River

Introduction

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

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

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 effluent limits (WQBELs) 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

Most effluent limits and monitoring requirements proposed for the following parameters are the same as in the previous permit, although some monitoring frequencies have changed.

New lower WQBELs are proposed for mercury because the WLA shows this parameter has the reasonable potential to exceed WQS; a 36 month compliance schedule is proposed.

Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit for *Ceriodaphnia dubia*. This satisfies the minimum testing requirements of Ohio Administrative Code (OAC) 3754-33-07(B)(11) and will adequately characterize toxicity in the plant's effluent. Increased monitoring for *Pimephales promelas* for 36 months is proposed because the effluent is placed in Category 3 for this species.

Phosphorus, nitrate+nitrite, and total Kjeldahl nitrogen (TKN) are being added to upstream monitoring station 801 in order to collect nutrient data to implement the total daily maximum load (TMDL). Metals monitoring and toxicity reporting are being removed from downstream monitoring 901 because these parameters are no longer necessary to determine compliance.

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.

Table of Contents

List of Figures

List of Tables

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 Sara Hise, (614) 644-4824, sara.hise@epa.ohio.gov.

Information Regarding Certain Water Quality Based Effluent Limits

This draft permit may contain proposed 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, written notification 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 3745-1-35. 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

O'Bannon Creek Regional WWTP discharges to the O'Bannon Creek at River Mile (RM) 2.57. Figure 1 shows the approximate location of the facility.

This segment of the O'Bannon Creek is described by Ohio EPA River Code: 11-001, County: Clermont, Ecoregion: Eastern Corn Belt Plains, U.S. EPA River Reach: 05090202-013. The O'Bannon Creek is designated for the following uses under Ohio's WQS (OAC 3745-1-18): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Class B Primary Contact Recreation (PCR). The section of the Little Miami River that O'Bannon Creek discharges to is designated as Class A PCR. Because O'Bannon Creek discharges so close to the Little Miami River, bacteria WQS will be based on Class A PCR.

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

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

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (PCR) and wading only (Secondary Contact - 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 AWS and IWS.

Facility Description

O'Bannon Creek Regional WWTP was constructed in 1983 and last upgraded in 2005. The average design flow is 4.4 million gallons per day (MGD). O'Bannon Creek Regional WWTP has the following treatment processes which are shown on Figure 2:

- Bar (Coarse) Screening
- Grit Removal
- Skimming
- Flow Equalization
- Aeration
- Oxidation Ditch
- Sand Filter
- Post-Aeration
- Ultraviolent Disinfection

The area served has 100% separated sewers and 0% combined sewers in the collection system. The O'Bannon Creek WWTP is part of the Clermont County approved pretreatment program. There is only one industrial user

that discharges to the O'Bannon Creek WWTP. The user is a non-categorical significant user that discharges approximately 0.005 MGD.

O'Bannon Creek Regional WWTP utilizes the following sewage sludge treatment processes:

- Aerobic Digestion
- Centrifuge (De-watering)

Treated sludge is land applied or disposed of in a municipal landfill.

Description of Existing Discharge

O'Bannon Creek WWTP discharges most treated wastewater through final outfall 001. A small portion is discharged through final outfall 002 to an irrigation pond for the O'Bannon Creek Golf Course (per OAC 3745-42-13). O'Bannon Creek Regional WWTP has an infiltration/inflow (I/I) rate of 0.144 MGD that does not cause known problems in the collection system but performs the following activities to minimize I/I: implementation of a rainfall-derived I/I monitoring and analysis program.

O'Bannon Creek Regional WWTP reports SSOs at station 300. Four SSOs were reported (December 2010, November 2011, November 2012, and December 2012).

Under the provisions of 40 CFR 122.21(j), the Director has waived the requirement for submittal of expanded effluent testing data as part of the NPDES renewal application. Ohio EPA has access to substantially identical information through the submission of annual pretreatment program reports and/or from Ohio EPA effluent testing conducted.

Table 1 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 001. Data are presented for the period January 2009 through January 2014, and current permit limits are provided for comparison.

Table 2 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 3 summarizes the results of acute and chronic WET tests of the final effluent.

Assessment of Impact on Receiving Waters

The O'Bannon Creek has been identified as a priority impaired water on Ohio's 303(d) list.

A TMDL report was approved for Little Miami River in 2010. 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 (IBI) and modified Index of Well-Being (MIwb), which indicate the response of the fish community, and the Invertebrate Community Index (ICI), 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 4) 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 (QHEI), and comments and observations for each sampling location.

The Little Miami River meets its use designation of Exceptional Warmwater Habitat but shows some impacts for aquatic life habitat and recreational uses due to the following: SSOs, WWTPs, storm sewers, home septic treatment systems, and non-point sources. The O'Bannon Creek meets its use designation of WWH, but the aquatic life use for the O'Bannon Creek is impaired due to natural conditions (such as low flow) and the recreational use is impaired due to bacteria. The TMDL does not recommend any limits for O'Bannon Creek Regional WWTP. The full TMDL report can be found at this website:
http://epa.ohio.gov/dsw/tmdl/LittleMiamiRiver.aspx#118215923-tmdl-report

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 O'Bannon Creek Regional 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)	January 2009 through January 2014

Outliers
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 2).

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 8 for a summary of the screening results.

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 degrade in the receiving water. WLAs using this method are done 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 O'Bannon Creek Regional WWTP is interactive with several dischargers on the Little Miami River (see Figure 3).

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. This facility discharges to the lower Little Miami River within a segment that is considered interactive (approximately RM 32 to 16) for conservative parameters. WLAs for conservative parameters in this segment were calculated through use of the Conservative Substance Wasteload Allocation (CONSWLA) model.

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

Aquatic life (WWH)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer 30Q10
		Winter 30Q10
AWS		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 6, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

Ohio's WQS implementation rules [OAC 3745-2-05(A)(2)(d)(iv)] required a phase out of mixing zones for bioaccumulative chemicals of concern (BCCs) as of November 15, 2010. This rule applied statewide. Mercury is a BCC. The mixing zone phase-out means that as of November 15, 2010 all dischargers requiring mercury limits in their NPDES permit must meet WQS at the end-of-pipe, which for mercury are 12 ng/L (average) and 1700 ng/L (maximum) in the Ohio River basin.

The data used in the WLA are listed in Table 5 and Table 6. The WLA results to maintain all applicable criteria are presented in Table 7.

Whole Effluent Toxicity WLA

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 O'Bannon Creek Regional 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 warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations.

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

The acute WLA for O'Bannon Creek Regional WWTP is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1 to 1.

Reasonable Potential/ Effluent Limits/Hazard 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 17. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table _, 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 8.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 9 presents the final effluent limits and monitoring requirements proposed for O'Bannon Creek Regional WWTP outfall 001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

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

Ammonia, Dissolved Oxygen, Total Suspended Solids, and Carbonaceous Biochemical Oxygen Demand (5-day)
The limits proposed for these parameters are all based on plant design criteria. These limits are protective of WQS. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

pH, Oil & Grease, and E. coli
Limits proposed for oil and grease, pH, and *E. coli* are based on WQS (OAC 3745-1-07). Class A PCR *E. coli* standards will be applied to the O'Bannon Creek due to the close proximity of the Little Miami River.

Copper and Mercury
The Ohio EPA risk assessment (Table 8) places these parameters in group 5. This placement, as well as the data in Table 1 and Table 2, indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For these parameters, 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).

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

A 36 month compliance schedule to meet the new mercury limits is detailed in Part I.C of the permit. As the O'Bannon Creek Regional WWTP may have difficulty complying with the limits for mercury and because cost effective measures for reducing mercury discharge concentrations may not be available for the permittee, they may apply for a variance by submitting a mercury variance application. Ohio EPA would then review the application, and if approved, would proceed to modify the permit to incorporate variance-based mercury limits and conditions associated with the mercury variance. O'Bannon Creek Regional WWTP is required to submit a mercury variance application (if needed) no later than 12 months after the effective date of the permit. If O'Bannon Creek Regional WWTP does not apply for a mercury variance and the permit is not modified, WQBELs for mercury will become effective 36 months from the effective date of the permit. Collecting and analyzing the samples for mercury must be done using U.S. EPA Method 1631 or 245.7.

Total Filterable Residue (Dissolved Solids)
The Ohio EPA risk assessment (Table 8) places this parameter in group 4. This placement, as well as the data in Table 1 and Table 2, 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). Monitoring is proposed to continue at the same frequency.

Cadmium, Chromium, Lead, Nickel, and Zinc

The Ohio EPA risk assessment (Table 8) places these parameters in groups 2 and 3. This placement, as well as the data in Table 1 and Table 2, 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 at a low frequency is proposed to document that these pollutants continue to remain at low levels.

Aldrin, Heptachlor, Selenium, Heptachlor Epoxide, gamma-Lindane, Hexachlorobenzene, Hexavalent Chromium (Dissolved), and Strontium
The Ohio EPA risk assessment (Table 8) places these in groups 2 and 3. This placement, as well as the data in Table 1 and Table 2, 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.

Phosphorus, Nitrate+Nitrite, and Total Kjeldahl Nitrogen
Based on BPJ, monitoring is proposed to continue for these parameters. The *2014 Ohio Integrated Water Quality Monitoring and Assessment Report* (Ohio EPA) lists the Little Miami River as impaired for aquatic life. The purpose of the monitoring is to maintain a nutrient data set for use in implementing the TMDL study.

Whole Effluent Toxicity Reasonable Potential
Based on evaluating the WET data presented in Table 3 and other pertinent data under the provisions of OAC 3745-33-07(B), the O'Bannon Creek Regional WWTP is placed in Category 3 with respect to WET. No limits are proposed, but increased acute testing is proposed for *Pimephales promelas* for 36 months. Annual chronic toxicity testing for *Pimephales promelas* and annual acute and chronic toxicity for *Ceriodaphnia dubia* is proposed to continue for the life of the permit. The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Additional Monitoring Requirements
Continued flow rate monitoring is proposed for outfall 002. New monitoring for phosphorus, nitrate+nitrate, and TKN is being proposed at upstream monitoring station 801 in order to gather data to implement the TMDL. Monitoring for metals and reporting for toxicity are proposed to be removed at downstream monitoring station 901 because it is no longer necessary to determine permit compliance. 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
A 36 month compliance schedule is proposed for the O'Bannon Creek Regional WWTP to meet the new daily maximum and monthly average concentration and loading limits for mercury. Details are in Part I.C of the permit. The permittee may also evaluate the need for a mercury variance.

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 adopted in December 2006 (OAC 3745-7-02). These rules require the O'Bannon Creek Regional WWTP to have a Class III wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001. These rules also require the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

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 O'Bannon Creek Regional WWTP may seek permit coverage under the general permit for industrial storm water (permit # OHR000005) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the O'Bannon Creek Regional 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.

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

Figure 1. Location of O'Bannon Creek Regional Wastewater Treatment Plant

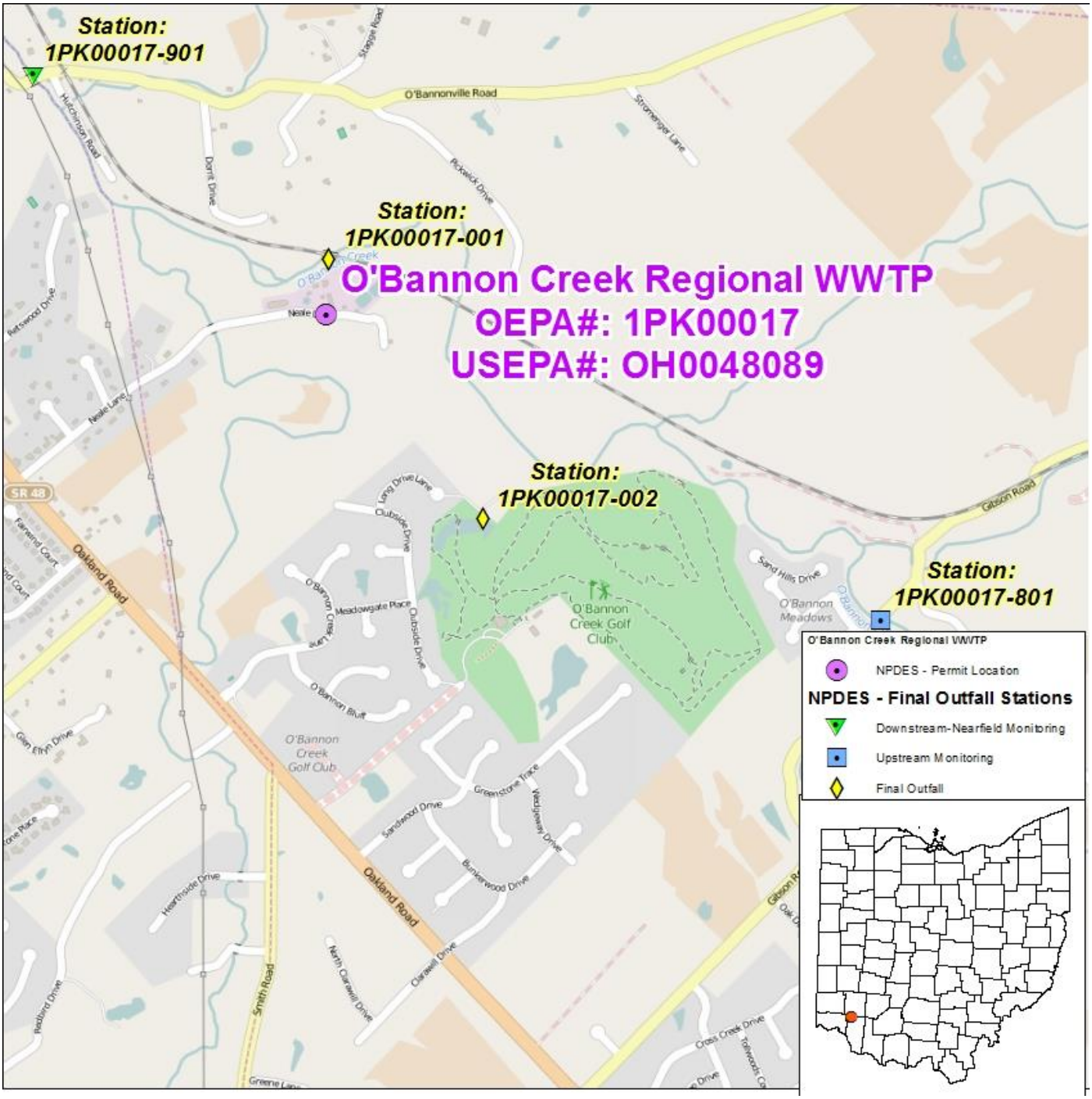

Figure 2. Diagram of Wastewater Treatment System

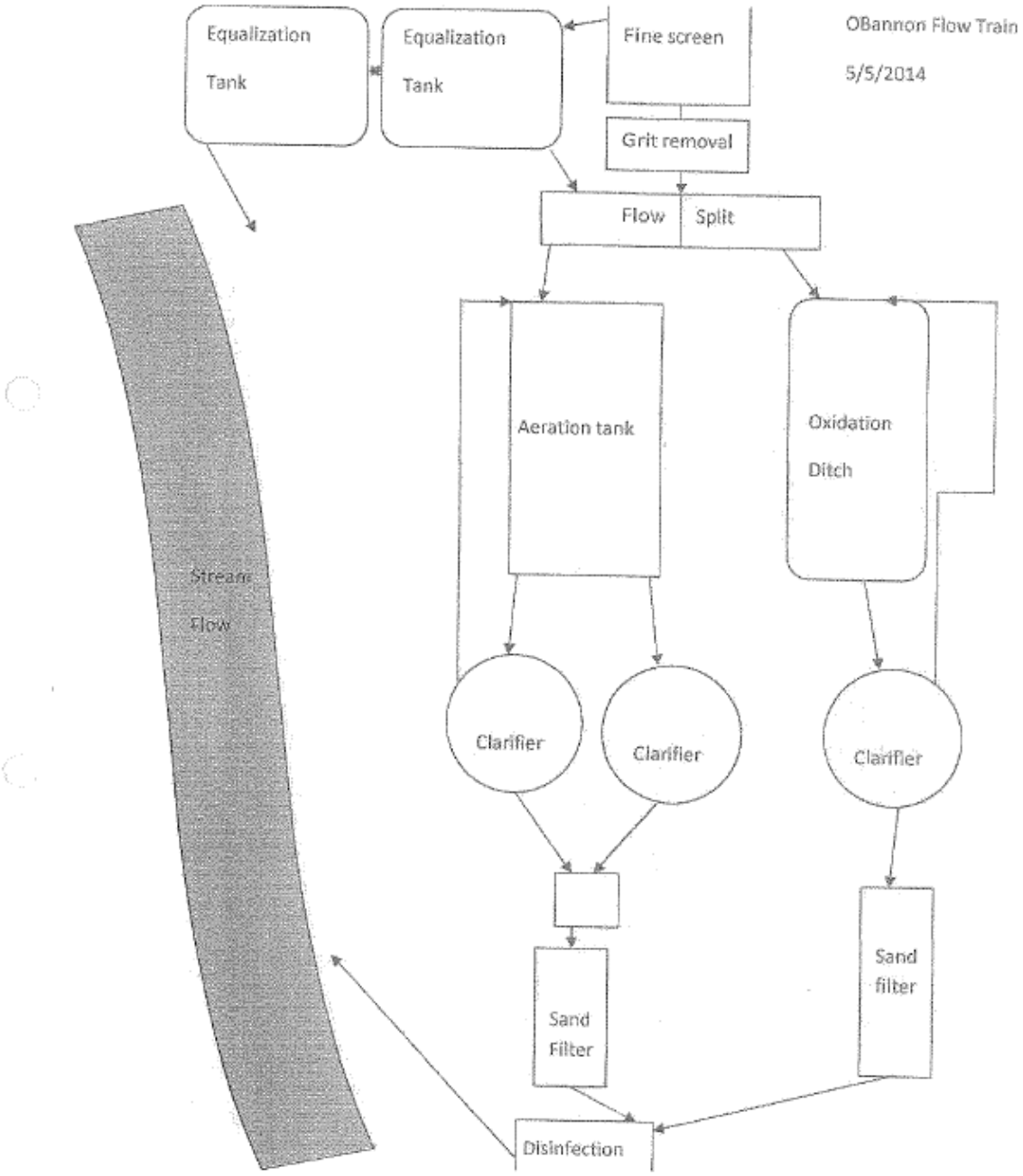

Figure 3. Little Miami River Study Area

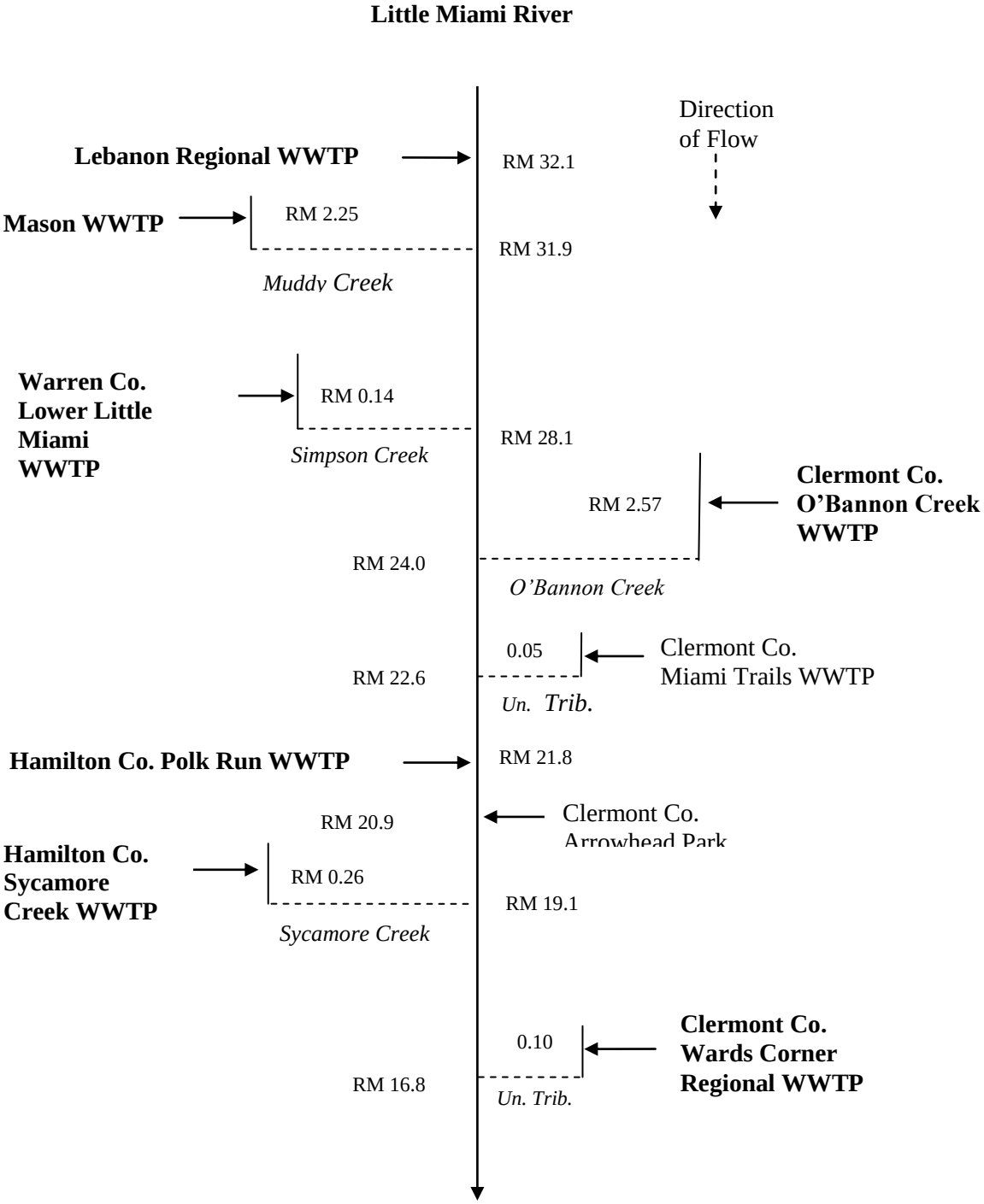

Table 1. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Outfall 001								
Water Temperature	Annual	℃	- - - - - Monitor - - - - -		1857	16	23	8.5-24
Dissolved Oxygen	Summer	mg/L	6.0 Minimum		920	8	9.4	5.8-10.3
	Winter	mg/L	6.0 Minimum		937	9.6	11.3	6.4-13.4
Total Filterable Residue	Annual	mg/L	- - - - - Monitor - - - - -		62	634	817	398-912
Total Suspended Solids	Annual	mg/L	12	18[a]	732	3.35	9	0-31.2
		kg/day	200	300[a]	--	--	--	--
Oil and Grease	Annual	mg/L	10 Maximum		66	0	0	0-76.6
Ammonia	Summer	mg/L	0.5	0.8[a]	382	0	1.15	0-2.94
		kg/day	8.3	13[a]	--	--	--	--
	Winter	mg/L	2.0	3.0[a]	372	0	0.556	0-4.92
		kg/day	33	50[a]	--	--	--	--
Total Kjeldahl Nitrogen	Annual	mg/L	- - - - - Monitor - - - - -		61	1.2	2.5	0-9.2
Nitrite + Nitrate	Annual	mg/L	- - - - - Monitor - - - - -		61	19.3	31	7.55-38.4
Phosphorus	Annual	mg/L	- - - - - Monitor - - - - -		243	2.73	4.36	0.608-6.27
Nickel	Annual	µg/L	- - - - - Monitor - - - - -		33	3.1	5.48	0-7.4
Zinc	Annual	µg/L	- - - - - Monitor - - - - -		33	44.2	59	18.7-63.4
Cadmium	Annual	µg/L	- - - - - Monitor - - - - -		33	0	0	0-0
Lead	Annual	µg/L	- - - - - Monitor - - - - -		33	0	0	0-0
Chromium	Annual	µg/L	- - - - - Monitor - - - - -		33	0	1.06	0-1.1
Copper	Annual	µg/L	18	28	115	13.8	22.4	0-60.8
		kg/day	0.3	0.5	--	--	--	--
E. coli	Annual	#/100 mL	126	284[a]	253	1	64.8	1-2200
Flow Rate	Annual	MGD	- - - - - Monitor - - - - -		1857	1.62	2.86	0.715-5.35
Mercury	Annual	ng/L	- - - - - Monitor - - - - -		20	2.27	10.9	0-11.2
Acute Toxicity								
Ceriodaphnia dubia	Annual	TU_a	- - - - - Monitor - - - - -		4	0	0	0-0
Pimephales promelas	Annual	TU_a	- - - - - Monitor - - - - -		4	0.25	0.5	0-0.5
Chronic Toxicity								
Ceriodaphnia dubia	Annual	TU_c	- - - - - Monitor - - - - -		4	0	1.2	0-1.41
Pimephales promelas	Annual	TU_c	- - - - - Monitor - - - - -		4	0	0	0-0
pH, Maximum	Annual	S.U.	--	9.0	1857	7.5	7.9	6.8-8.1
pH, Minimum	Annual	S.U.	--	6.5	1857	7.4	7.7	6.7-7.9
Carbonaceous Biochemical Oxygen Demand (5 day)	Annual	mg/L	8.0	12[a]	723	2.8	5.56	0-13.7
		kg/day	133	200[a]	--	--	--	--

Table 1. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Outfall 002								
Flow Rate	Annual	MGD	- - - - - Monitor - - - - -		557	0.089	0.273	0-0.436
Sanitary Sewer Overflow Monitoring Station 300								
Overflow Occurrence	Annual	No./Month	- - - - - Monitor - - - - -		61	0	1	0-1
Sludge Monitoring Station 581								
Ammonia	Annual	mg/kg	- - - - - Monitor - - - - -		16	4550	11300	1110-20300
Total Kjeldahl Nitrogen	Annual	mg/kg	- - - - - Monitor - - - - -		16	53200	74600	41600-87900
Phosphorus	Annual	mg/kg	- - - - - Monitor - - - - -		15	16100	23600	8970-24600
Potassium	Annual	mg/kg	- - - - - Monitor - - - - -		14	2050	3190	0-3210
Arsenic	Annual	mg/kg	--	75	15	4.38	6.95	0-7.3
Cadmium	Annual	mg/kg	--	85	15	0	1.28	0-1.39
Copper	Annual	mg/kg	--	4300	15	454	835	114-1060
Lead	Annual	mg/kg	--	840	15	14.3	26.2	2.63-34.7
Nickel	Annual	mg/kg	--	420	15	15.5	22	3.45-26.3
Zinc	Annual	mg/kg	--	7500	15	463	904	133-993
Selenium	Annual	mg/kg	--	100	15	5.2	9.01	0-9.03
Sludge Fee Weight	Annual	dry tons	- - - - - Monitor - - - - -		6	7.87	17.6	0-19.4
Fecal Coliform	Annual	CFU/gram	--	2000000	7	120000	442000	23000-520000
Sludge Weight	Annual	Dry Tons	- - - - - Monitor - - - - -		9	9.46	18.1	0-19.4
Mercury	Annual	mg/kg	--	57	15	0	1.16	0-1.52
Molybdenum	Annual	mg/kg	--	75	15	7.22	10	0-12.7
Sludge Monitoring Station 586								
Sludge Fee Weight	Annual	dry tons	- - - - - Monitor - - - - -		4	262	326	250-337
Sludge Monitoring Station 588								
Sludge Weight	Annual	dry tons	- - - - - Monitor - - - - -		--	--	--	--
Influent Monitoring Station 601								
Total Suspended Solids	Annual	mg/L	- - - - - Monitor - - - - -		732	221	467	42-1300
Nickel	Annual	µg/L	- - - - - Monitor - - - - -		4	2.1	2.37	1.6-2.4
Zinc	Annual	µg/L	- - - - - Monitor - - - - -		4	82.7	94	62.4-94.4
Cadmium	Annual	µg/L	- - - - - Monitor - - - - -		4	0	0.0935	0-0.11
Lead	Annual	µg/L	- - - - - Monitor - - - - -		4	0	0.935	0-1.1
Chromium	Annual	µg/L	- - - - - Monitor - - - - -		4	1.2	1.47	0-1.5

Table 1. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Copper	Annual	µg/L	- - - - - Monitor - - - - -		69	52.1	79.9	16.6-89.4
Mercury	Annual	ng/L	- - - - - Monitor - - - - -		12	25.1	53.9	8.26-67.3
pH, Maximum	Annual	S.U.	- - - - - Monitor - - - - -		365	7.7	8	6.9-8.2
pH, Minimum	Annual	S.U.	- - - - - Monitor - - - - -		365	7.5	7.7	5.8-7.9
Carbonaceous Biochemical Oxygen Demand (5 day)	Summer	mg/L	- - - - - Monitor - - - - -		353	169	274	0-353
	Winter	mg/L	- - - - - Monitor - - - - -		371	146	241	0-361
Upstream Monitoring Station 801								
Water Temperature	Annual	℃	- - - - - Monitor - - - - -		61	12	24	0-25.1
Dissolved Oxygen	Summer	mg/L	- - - - - Monitor - - - - -		30	7.15	10.1	3.96-11.7
	Winter	mg/L	- - - - - Monitor - - - - -		31	13	18.1	6.4-19.9
pH	Annual	S.U.	- - - - - Monitor - - - - -		61	7.8	8.3	7.2-8.6
Ammonia	Summer	mg/L	- - - - - Monitor - - - - -		30	0	0.0759	0-0.212
	Winter	mg/L	- - - - - Monitor - - - - -		31	0	0.0505	0-0.296
E. coli	Annual	#/100 mL	- - - - - Monitor - - - - -		21	120	5800	7.7-6400
Acute Toxicity								
Ceriodaphnia dubia	Annual	% Affected	- - - - - Monitor - - - - -		4	0	0	0-0
Pimephales promelas	Annual	% Affected	- - - - - Monitor - - - - -		4	6	16.8	0-18
Chronic Toxicity								
Ceriodaphnia dubia	Annual	% Affected	- - - - - Monitor - - - - -		4	0	0	0-0
Pimephales promelas	Annual	% Affected	- - - - - Monitor - - - - -		4	15	43.5	2-48
Downstream Monitoring Station 901								
Water Temperature	Annual	℃	- - - - - Monitor - - - - -		61	11.4	23.7	0.3-24
Dissolved Oxygen	Summer	mg/L	- - - - - Monitor - - - - -		30	7.54	9.63	3.61-11.1
	Winter	mg/L	- - - - - Monitor - - - - -		31	13.4	17.2	8.9-18.9
pH	Annual	S.U.	- - - - - Monitor - - - - -		61	8	8.4	7.3-8.7
Ammonia	Summer	mg/L	- - - - - Monitor - - - - -		30	0	0.202	0-0.449
	Winter	mg/L	- - - - - Monitor - - - - -		31	0	0.198	0-0.303
Hardness	Annual	mg/L	- - - - - Monitor - - - - -		31	224	298	116-318
Nickel	Annual	µg/L	- - - - - Monitor - - - - -		4	1.4	1.86	0-1.9
Zinc	Annual	µg/L	- - - - - Monitor - - - - -		4	9.1	13.5	7.5-14.2
Cadmium	Annual	µg/L	- - - - - Monitor - - - - -		4	0	0	0-0
Lead	Annual	µg/L	- - - - - Monitor - - - - -		4	0	0	0-0
Chromium	Annual	µg/L	- - - - - Monitor - - - - -		4	0	1.53	0-1.8
Copper	Annual	µg/L	- - - - - Monitor - - - - -		31	2.6	5.47	0-8.18
E. coli	Annual	#/100 mL	- - - - - Monitor - - - - -		21	130	5800	31-7000
Acute Toxicity								

Table 1. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Ceriodaphnia dubia	Annual	% Affected	- - - - - Monitor - - - - -		4	0	0	0-0
Pimephales promelas	Annual	% Affected	- - - - - Monitor - - - - -		4	5	9.7	0-10

All values are based on annual records unless otherwise indicated. * = 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."

Table 2. Projected Effluent Quality

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Aldrin	µg/L	6	0	--	--
Ammonia (Summer)	mg/L	262	93	0.963	1.25
Ammonia (Winter)	mg/L	192	56	0.592	0.812
Cadmium	µg/L	33	0	--	--
Chromium	µg/L	22	4	1.04	1.43
Copper	µg/L	115	113	20.3	27.2
gamma-Lindane	µg/L	6	0	--	--
Heptachlor	µg/L	6	0	--	--
Heptachlor Epoxide	µg/L	6	0	--	--
Hexachlorobenzene	µg/L	6	0	--	--
Hexavalent Chromium (Dissolved)	µg/L	6	0	--	--
Lead	µg/L	33	0	--	--
Mercury	ng/L	20	19	11.5	15.7
Nickel	µg/L	33	21	6.48	8.88
Nitrate+Nitrite	mg/L	61	61	28.7	39.1
Phosphorus	mg/L	243	243	3.20	4.39
Strontium	µg/L	19	19	318	351
Total Filterable Residue (Dissolved Solids)	mg/L	62	62	754	881
Total Kjeldahl Nitrogen	mg/L	61	57	2.89	4.55
Zinc	µg/L	33	33	59.4	77.4

MDL = analytical method detection limit
PEQ = projected effluent quality

Table 3. Summary of Acute and Chronic Toxicity Results

	Ceriodaphnia Dubia		*Pimephales promelas*	
Date	**TU_a**	**TU_c**	**TU_a**	**TU_c**
8/15/2010	AA	AA	AA	AA
8/14/2011	AA	1.41	AA	AA
8/20/2012	AA	AA	0.5	AA
8/5/2013	AA	AA	0.5	AA

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

Table 4. A Summary of the Little Miami River and Selected Tributaries Use Designation Status, and Causes/Sources of Impairment, 2007 Survey

Location	River Mile	Use Designation	Status	Causes of Impairment	Sources of Impairment
LMR @ U.S. Route 48	33	EWH	FULL		
LMR @ King's Mill Rd.	31	EWH	(FULL)		
LMR dst. Simpson Ck	28	EWH	FULL		
LMR upst. O'Bannon Ck	24	EWH	FULL		
LMR @ Loveland-Kemper Rd	22	EWH	FULL		
LMR adjacent to Lake Isabella	21	EWH	FULL		
LMR @ SR 126	18	EWH	FULL		
LMR @ Newtown Rd.	8.1	EWH	FULL		
Muddy Creek upst. Mason WWTP	2.5	WWH	PARTIAL	Natural Conditions (Flow)	Natural
Muddy Creek dst. Mason WWTP	0.5	WWH	PARTIAL	Sedimentation/Siltation, Nutrient/Organic, Enrichment (Sewage)	Municipal point source discharges
				Biological Indicators	
O'Bannon Creek @ Gibson Rd.	4.4	WWH	PARTIAL	Natural Conditions (Flow)	Natural
O'Bannon Creek @ State Route 48	0.3	WWH	FULL		
Sycamore Creek dst. N. Fk. Sycamore Ck.	0.5	WWH	FULL		
Sycamore Creek dst. Sycamore Ck. WWTP	0.1	WWH	FULL		

Ck = creek
dst = downstream
EWH = exceptional warmwater habitat
Fk = Fork
LMR = Little Miami River
Rd = road
U.S. = United States
WWH = warmwater habitat
WWTP = wastewater treatment plant
upst = upstream

Table 5. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria: Average: Human Health	Average: Agri-culture	Average: Aquatic Life	Outside Mixing Zone Criteria: Maximum Aquatic Life	Inside Mixing Zone Maximum
All Streams						
Arsenic	µg/L	--	100	150	340	680
Barium	µg/L	--	--	220	2000	4000
Benzo(b)fluoranthene[C]	µg/L	0.49	--	--	--	--
Bis(2-ethylhexyl)phthalate[C]	µg/L	59	--	8.4	1100	2100
Bromomethane	µg/L	4000	--	16	38	75
Chlorine, Total Residual	µg/L	--	--	11	19	38
Chloroform[C]	µg/L	4700	--	140	1300	2600
Hexavalent Chromium (Dissolved)	µg/L	--	--	11	16	31
Cyanide, Free	µg/L	220000	--	12	46	92
Dibenzo(a,h)anthracene[C]	µg/L	0.49	--	--	--	--
Indeno(1,2,3-c,d)pyrene[C]	µg/L	0.49	--	--	--	--
Iron	µg/L	--	5000	--	--	--
Mercury[B]	ng/L	12	10000	910	1700	3400
Molybdenum	µg/L	--	--	20000	190000	370000
Nitrate+Nitrite	mg/L	--	100	--	--	--
Selenium	µg/L	11000	50	5	--	--
Strontium	µg/L	--	--	21000	40000	81000
Thallium	µg/L	6.3	--	17	79	160
Toluene	µg/L	200000	--	62	560	1100
Total Filterable Residue	mg/L	--	--	1500	--	--
Little Miami River & Simpson Creek; Hardness = 298. mg/L						
Cadmium	µg/L	--	50	5.8	15	31
Chromium	µg/L	--	100	210	4400	8800
Copper	µg/L	1300	500	24	39	78
Lead	µg/L	--	100	26	490	980
Nickel	µg/L	4600	200	130	1200	2400
Silver	µg/L	--	--	1.3	10	21
Zinc	µg/L	69000	25000	300	300	600
Muddy Creek; Hardness = 250. mg/L						
Cadmium	µg/L	--	50	5.1	13	25
Chromium	µg/L	--	100	180	3800	7600
Copper	µg/L	1300	500	20	33	66

Table 5. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria: Average: Human Health	Outside Mixing Zone Criteria: Average: Agri-culture	Outside Mixing Zone Criteria: Average: Aquatic Life	Outside Mixing Zone Criteria: Maximum Aquatic Life	Inside Mixing Zone Maximum
Lead	µg/L	--	100	21	390	790
Nickel	µg/L	4600	200	110	1000	2000
Silver	µg/L	--	--	1.3	7.7	15
Zinc	µg/L	69000	25000	260	260	520
O'Bannon Creek; Hardness = 220. mg/L						
Cadmium	µg/L	--	50	4.6	11	22
Chromium	µg/L	--	100	160	3400	6900
Copper	µg/L	1300	500	18	29	59
Lead	µg/L	--	100	18	330	670
Nickel	µg/L	4600	200	100	910	1800
Silver	µg/L	--	--	1.3	6.2	12
Zinc	µg/L	69000	25000	230	230	470
Sycamore Creek; Hardness = 286. mg/L						
Cadmium	µg/L	--	50	5.6	15	30
Chromium	µg/L	--	100	200	4300	8500
Copper	µg/L	1300	500	23	38	75
Lead	µg/L	--	100	24	470	930
Nickel	µg/L	4600	200	130	1100	2300
Silver	µg/L	--	--	1.3	9.7	19
Zinc	µg/L	69000	25000	290	290	580

B = Bioaccumulative Chemical of Concern
C = Carcinogen

Table 6. Instream Conditions and Discharger Flow

Parameter	Units	Value				
		Little Miami	Muddy Creek	Simpson Creek	O'Bannon Creek	Sycamore Creek
7Q10 (annual)	cfs	58.8[A]	0.0[B]	0.0[B]	0.0[B]	0.0[B]
1Q10 (annual)	cfs	46.9[A]	0.0[B]	0.0[B]	0.0[B]	0.0[B]
30Q10 (summer)	cfs	78.9[A]	0.0[B]	0.0[B]	0.0[B]	0.01[B]
30Q10 (winter)	cfs	224[A]	0.62[B]	0.06[B]	2.61[B]	1.46[B]
Harmonic Mean (annual)	cfs	377[A]	0.12[B]	0.0[B]	0.49[B]	0.27[B]
Mixing Assumption	% average	100	100	100	100	100
	% maximum	100	100	100	100	100
Instream Hardness	mg/L	298[C,D]	250[C,D]	298[C,D]	220[C,D]	286[C,D]
Background Water Quality						
Arsenic	µg/L	1.0[C]	3.1[C]	2.6[C]	1.2[C]	1.0[C]
Barium	µg/L	84[C]	64.7[C]	40[C]	47.8[C]	40[C]
Benzo(b)fluoranthene	µg/L	0.0[E]	0.0[E]	0.0[E]	0.0[E]	0.0[E]
Bis(2-ethylhexyl)phthalate	µg/L	0.0[E]	0.0[E]	0.0[E]	0.0[E]	0.0[E]
Cadmium	µg/L	0.0[E]	0.0[E]	0.0[E]	0.0[E]	0.0[E]
Chlorine, Total Residual	µg/L	0.0[E]	0.0[E]	0.0[E]	0.0[E]	0.0[E]
Hexavalant Chromium (Dissolved)	µg/L	0.0[E]	0.0[E]	0.0[E]	0.0[E]	0.0[E]
Chromium	µg/L	15[C]	0.0[F]	0.0[F]	0.0[F]	0.0[F]
Copper	µg/L	5.0[C]	0.0[F]	4.5[C]	6.2[C]	5.0[C]
Cyanide, free	µg/L	0.0[E]	0.0[E]	0.0[E]	0.0[E]	0.0[E]
Dibenzo(a,h)anthracene	µg/L	0.0[E]	0.0[E]	0.0[E]	0.0[E]	0.0[E]
Ideno(1,2,3-c,d)pyrene	µg/L	0.0[E]	0.0[E]	0.0[E]	0.0[E]	0.0[E]
Iron	µg/L	453[C]	198[C]	258[C]	330[C]	248[C]
Lead	µg/L	1.0[C]	0.0[F]	0.0[F]	1.7[C]	1.0[C]
Molybdenum	µg/L	0.0[E]	0.0[E]	0.0[E]	0.0[E]	0.0[E]
Nickel	µg/L	20[C]	0.0[F]	0.0[F]	0.0[F]	0.0[F]
Nitrate+Nitrite	mg/L	2.63[C]	0.07[C]	0.65[C]	0.28[C]	0.1[C]
Selenium	µg/L	0.0[F]	0.0[F]	0.0[F]	0.0[F]	0.0[F]
Silver	µg/L	0.0[E]	0.0[E]	0.0[E]	0.0[E]	0.0[E]
Thallium	µg/L	0.0[E]	0.0[E]	0.0[E]	0.0[E]	0.0[E]
Total Filterable Residue	mg/L	414[C]	630[C]	450[C]	297[C]	360[C]
Zinc	µg/L	5.0[C]	0.0[F]	8.7[C]	7.0[C]	5.0[C]

A = Based on USGS gage #03245500, LMR @ Milford data (10/1/1975 - 9/30/2013)
B = Based on USGS gage #03246500, East Fork LMR @ Williamsburg data (1949-53; 1960-74)
C = United States Environmental Protection Agency Storage and Retrieval Database (1997-2008)
D = Downstream Monitoring Station 901 Discharge Monitoring Report data (2009-2014)
E = No representative data available.
LMR = Little Miami River
USGS = United States Geological Survey

Table 7. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average			Maximum	Inside Mixing Zone Maximum
		Human Health	Agri Supply	Aquatic Life	Aquatic Life	
Copper	µg/L	1393[A]	536 [A]	18	29	59
Mercury[C]	ng/L	12	10000 [A]	910	1700	3400
Nitrate+Nitrite	mg/L	--	107	--	--	--
Total Filterable Residue	mg/L	--	--	1500	--	--
Zinc	µg/L	70960 [A]	26800 [A]	230	230	460

A = Allocation must not exceed the Inside Mixing Zone Maximum.
C = Bioaccumulative Chemical of Concern; water quality standard must be met at end-of-pipe, unless requirements for an exception are met as listed in Ohio Administrative Code 3745-2-08(L).

Table 8. Parameter Assessment

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

Phosphorus	Total Kjeldahl Nitrogen

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

Aldrin	Hexavalent Chromium	Cadmium
Chromium	Heptachlor	Selenium
Heptachlor Epoxide	gamma-Lindane	Lead
Nickel	Hexachlorobenzene	Strontium

Group 3: PEQ_{max} < 50% of maximum PEL and PEQ_{avg} < 50% of average PEL. No limit recommended, monitoring optional.

Ammonia	Nitrate+Nitrite	Zinc

Group 4: PEQ_{max} > 50% but <100% of the maximum PEL or PEQ_{avg} > 50% but < 100% of the average PEL. Monitoring is appropriate.

Total Filterable Residue

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

	Applicable		*Recommended Effluent Limits*	
Parameter	*Units*	*Period*	*Average*	*Maximum*
Copper	µg/L	annual	18	29
Mercury	ng/L	annual	12	1700

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

Table 9. Final Effluent Limits for Outfall 001

Parameter	Units	Concentration		Loading (kg/day)[a]		Basis[b]
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Water Temperature	°C	- - - - - - - - - - Monitor - - - - - - - - - -				EP/M[c]
Dissolved Oxygen	mg/L	6.0 minimum		--	--	EP
Total Suspended Solids	mg/L	12	18[d]	200	300[d]	EP/PD
Oil & Grease	mg/L	10 maximum		--	--	EP/WQS
Ammonia						
Summer	mg/L	0.5	0.8[d]	8.3	13[d]	EP
Winter	mg/L	2.0	3.0[d]	33	50[d]	EP
Total Kjeldahl Nitrogen	mg/L	- - - - - - - - - - Monitor - - - - - - - - - -				EP/BPJ
Nitrate+Nitrite	mg/L	- - - - - - - - - - Monitor - - - - - - - - - -				EP/BPJ
Phosphorus	mg/L	- - - - - - - - - - Monitor - - - - - - - - - -				EP/BPJ
Nickel	µg/L	- - - - - - - - - - Monitor - - - - - - - - - -				EP
Zinc	µg/L	- - - - - - - - - - Monitor - - - - - - - - - -				EP
Cadmium	µg/L	- - - - - - - - - - Monitor - - - - - - - - - -				EP
Lead	µg/L	- - - - - - - - - - Monitor - - - - - - - - - -				EP
Chromium	µg/L	- - - - - - - - - - Monitor - - - - - - - - - -				EP
Copper	µg/L	18	28	0.3	0.5	EP/WLA/ABS
E. coli	#/100 mL	126	284[d]	--	--	WQS
Flow Rate	MGD	- - - - - - - - - - Monitor - - - - - - - - - -				EP/M[c]
Mercury	ng/L	12	1700	0.0002	0.0284	WLA
Acute Toxicity						
Ceriodaphnia Dubia	TU_a	- - - - - - - - - - Monitor - - - - - - - - - -				WET
Pimephales promelas	TU_a	- - - - - - - - - - Monitor - - - - - - - - - -				WET
Chronic Toxicity						
Ceriodaphnia Dubia	TU_c	- - - - - - - - - - Monitor - - - - - - - - - -				WET
Pimephales promelas	TU_c	- - - - - - - - - - Monitor - - - - - - - - - -				WET
pH	S.U.	6.5 - 9.0		--	--	WQS
Total Filterable Residue	mg/L	- - - - - - - - - - Monitor - - - - - - - - - -				EP/RP
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	8	12[d]	133	200[d]	EP/PD

[a] Effluent loadings based on average design discharge flow of 4.4 million gallons per day.

[b] Definitions: **ABS** = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l))
BPJ = Best Professional Judgment
EP = Existing Permit
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
PD = Plant Design
RP = Reasonable Potential for requiring water quality-based effluent limits and

monitoring requirements in permits (3745-33-07(A))
WET = Whole Effluent Toxicity (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.