National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for **Tri-Cities North Regional Wastewater Authority**

Public Notice No.: 15-05-010
Public Notice Date: May 15, 2015
Comment Period Ends: June 15, 2015

Ohio EPA Permit No.: **1PD00020*JD**
Application No.: **OH0049646**

Name and Address of Applicant:

Tri-Cities North Regional Wastewater Authority
3777 Old Needmore Road
Dayton, Ohio 45424

Name and Address of Facility Where Discharge Occurs:

Tri-Cities North Regional Wastewater Authority
3777 Old Needmore Road
Dayton, Ohio 45424
Montgomery County

Receiving Water: Great Miami River

Subsequent Stream Network: 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.

In accordance with the antidegradation rule, Ohio Administrative Code (OAC) 3745-1-05, a lowering of water quality in the Great Miami River is not necessary and no increase in ammonia limits is proposed to be granted.

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 EPA (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 proposed effluent limits and monitoring requirements for most parameters are the same as in the current permit, although some monitoring frequencies have changed.

New limits are proposed for bis(2-ethylhexyl)phthalate based on the reasonable potential to exceed WQS.

New monitoring is proposed for indeno(1,2,3-cd)pyrene based its placement in the risk assessment. New monitoring for orthophosphate (as P) is proposed based on the passage of Senate Bill 1.

No monitoring is proposed to be removed, although the monitoring frequency for silver and barium is proposed to be reduced.

Final effluent limits are proposed for *Escherichia coli.* New WQS for *E. coli* became effective in March 2010. A compliance schedule is proposed for meeting these new final effluent limits. Based on best engineering judgment, it is proposed that the plant comply with its current fecal coliform limits during the interim period.

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

New approved methods for free cyanide are now listed in 40 CFR 136.3. This permit requires the permittee to begin using of the two approved methods as soon as possible. A condition is included in Part II of the permit.

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; outfall signage; pretreatment program requirements, new free cyanide analytical method, and public water supply notification.

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Procedures for Participation in the Formulation of Final Determinations

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

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

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

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

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

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

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

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

For additional information about this fact sheet or the draft permit, contact Sara Hise, (614) 644-4824, sara.hise@epa.ohio.gov.

Information Regarding Certain Water Quality Based Effluent Limits

This draft permit may contain proposed water quality based effluent limitations (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 Section 6111.03(J)(3), the Director established these water quality based effluent limits 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

The Tri-Cities North Regional Wastewater Authority owns the Tri-Cities wastewater treatment plant (WWTP), which discharges to Great Miami River at River Mile (RM) 87.47. Figure 1 shows the approximate location of the facility.

This segment of the Great Miami River is described by Ohio EPA River Code: 14-001, U.S. EPA River Reach #: 05080002-009, County: Montgomery, Ecoregion: Eastern Corn Belt Plains. The Great Miami River is designated for the following uses under Ohio's WQS (OAC 3745-1-21): Warmwater habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Class A Primary Contact Recreation (PCR).

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

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

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (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

The Tri-Cities WWTP has an average design flow of 11.2 million gallons per day (MGD) with a peak hydraulic capacity of 32 MGD. It was constructed in 1985 and last upgraded in 1991. Treatment plant processes and/or equipment include:

- Influent pumping
- Bar screen
- Grit removal
- Comminution
- Scum removal
- Flow equalization
- Primary clarification
- Trickling filter (plastic media)
- Intermediate settling
- Advanced treatment (nitrification towers)
- Secondary clarification
- Chlorination/dechlorination

- Post-aeration

The facility does not include any provisions for bypassing partially treated or untreated wastewater at the WWTP. The final outfall is located several thousand feet from the WWTP; flooding is a concern. The facility will need to investigate a method to collect a representative sample even during flooding.

Residuals solids from the system are stabilized through the anaerobic digestion process. Methane from the digesters is used daily in three gas generators to reduce the plant power load. This is part of an energy exchange program with the local power company. Stabilized solids are pumped via force main seven miles to six storage vessels located at sludge sites along U.S. Route 40, Montgomery County, and Sullivan Road, in Bethel Township, Miami County. Biosolids are land applied on three farms which include 23 fields. A total of 642 acres is available for land application. The Tri-Cities WWTP uses a grid system with global positioning system location equipment to adjust field application rates based on soil conditions and crop yields. Biosolids are pumped directly from the storage tanks for immediate injection into the soil though an umbilical system that is pulled behind the tractor. Sixteen groundwater monitoring wells and a spring are used to monitor groundwater quality in the area for potential impacts from the land application operations. In 2014, the Tri-Cities WWTP disposed of 826 dry tons of solids.

The collection is 100% separate sewers and serves the cities of Huber Heights, Vandalia, Tipp City and part of Miami County for an approximate total population of 64,000. There are no engineered bypasses or overflows in the collection system; however, SSOs are a concern. Each of the three communities maintains their own collection system. The estimated infiltration and inflow (I/I) rate is 2.342 MGD.

Five industrial users (three categorical users and two non-categorical significant industrial users) discharge into the collection system at an estimated 0.3455 MGD. The categorical users contribute 0.0842 MGD and the non-categorical significant industrial users contribute an estimated 0.2613 MGD. The Tri-Cities North Regional Wastewater Authority has an approved pretreatment program.

Description of Existing Discharge

The Tri-Cities North Regional Wastewater Authority reports SSO occurrences under Station 300 in its NPDES permit. There was one SSO in 2009, 11 in 2010, 25 in 2011, nine in 2012, and 5 through September 2013. Many events were attributed to heavy rainfall. The facility is following a U.S. EPA capacity, management, operation, and maintenance (CMOM) program approved in 2011 to minimize I/I; minimizing I/I should also minimize some of the SSOs. The Tri-Cities North Regional Wastewater Authority also has plans for pump station upgrades, sewer lining projects, and an equalization project to reduce SSOs.

The Tri-Cities WWTP also reported numerous violations of its ammonia limits through 2011. Operational changes seem to have mitigated this issue.

Table 1 presents chemical specific data compiled from data reported in annual pretreatment reports and data collected by Ohio EPA.

Table 2 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 001. Data are presented for the period January 2008 and September 2013, and current permit limits are provided for comparison.

Table 3 presents the average and maximum PEQ values for outfall 001.

Table 4 summarizes the results of acute and chronic WET tests of the final effluent.

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 effluent testing conducted by Ohio EPA.

Assessment of Impact on Receiving Waters

An assessment of the aquatic life and recreational use potential of a portion of the Great Miami River was performed in 2009 and 2010. This assessment included the collection of water chemistry and biological sampling at numerous sites in the mainstem Great Miami River and selected tributaries. A summary of the results from this assessment can be found in Table 5. More information on the 2009-2010 sampling can be found in the following two technical support documents (TSDs): "Biological and Water Quality Study of the Middle Great Miami River and Principal Tributaries, 2009", Jan. 2013; and, "Biological and Water Quality Study of the Lower Great Miami River and Selected Tributaries, 2010", May 2012. These documents can be viewed through the Ohio EPA, Division of Surface Water website: http://epa.ohio.gov/dsw/document_index/psdindx.aspx.

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 WET 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 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 Great Miami River is in partial attainment near the Tri-Cities North Regional Wastewater Authority due to some ammonia toxicity. Downstream from Tri-Cities North Regional Wastewater Authority the lower Great Miami River is impaired due to excess amounts of nutrients.

Great Miami River Approach

For the Dayton and Montgomery County Western Regional WWTPs – These two plants are the largest and most upstream discharges of the lower Great Miami River watershed and contribute to a significant increase in the total phosphorus concentrations, dissolved oxygen swings and chlorophyll-a values in the river. A seasonal aggregate total phosphorus loading limit applies for the period July through October. The limit was calculated using the plant's average seasonal flow for the years 2010 through 2014 and a total phosphorus concentration of 1 mg/l. The permits allow 36 months for the plants to meet the seasonal loading limit.

For the other major WWTPs – Continued monitoring of total phosphorus in their effluent as well as upstream and downstream of their discharges. These plants also must develop a study that evaluates the technical and financial capability of their existing treatment facilities to reduce total phosphorus to 1 mg/l or lower. This study is required by Ohio Senate Bill 1, which was signed by the Governor on April 2, 2015. The study must be submitted to Ohio EPA by December 1, 2017. Ohio EPA is implementing this Ohio Senate Bill 1 requirement outside of NPDES permits. Instead, Ohio EPA will send a letter instructing all applicable facilities how to comply with the evaluation study required by Ohio Senate Bill 1.

Ohio EPA is working with Ohio Department of Natural Resources and representatives of the Joint Board of the Soil Water Conservation Districts to identify areas for concentrating efforts to reduce agricultural runoff to streams. This effort includes site selection; installing best management practices; and measuring the baseline and success of the practices.

If the river has not returned to full attainment, the next NPDES permit renewals may be informed by an Ohio EPA-approved integrated management plan prepared by the lower Great Miami River dischargers and/or an approved TMDL prepared by Ohio EPA. If supported by these or other applicable reports, the permittees may propose using alternate reduction strategies to achieve future phosphorus reductions. The strategies could include point source-nonpoint source trading, point source-point source trading, habitat restoration offsets, physical watershed alterations and other approved nutrient management/reduction strategies.

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 Tri-Cities North Regional Wastewater Authority were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio 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 2008 through September 2013
Pretreatment data	2009 - 2012
Ohio EPA compliance sampling data	2011, 2012

Non-representative Data:
The data were examined, and no values were removed from the evaluation to give a more reliable PEQ.

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. The average and maximum PEQ values are presented in Table 3.

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 9 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. 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 Great Miami River within a large interactive segment with multiple other dischargers. WLAs for conservative parameters in this interactive segment were calculated through use of the Conservative Substance Wasteload Allocation (CONSLWA) model.

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

Aquatic life (EWH)		
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 7, and allocations cannot exceed the Inside Mixing Zone Maximum 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 are 12 ng/l (average) and 1700 ng/l (maximum) in the Ohio River basin, or 1.3 ng/l (average) and 1700 ng/l (maximum) in the Lake Erie basin.

The data used in the WLA are listed in Tables 6 and 7. The WLA results to maintain all applicable criteria are presented in Table 8. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

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 Tri-Cities WWTP, the WLA values are 1.0 TU_a and 4.37 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.

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 8. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 3, 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 9.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 10 presents the final effluent limits and monitoring requirements proposed for Tri-Cities outfall 001 and the basis for their recommendation.

Water Temperature and Flow Rate
Monitoring is proposed to continue in order to assist in the evaluation of effluent quality and treatment plant performance in accordance with Ohio EPA guidance.

Oil and Grease, and pH
Limits are based on WQS and are proposed to continue.

Total Suspended Solids, Ammonia, Chlorine – Total Residual, Dissolved Oxygen, and Carbonaceous Biochemical Oxygen Demand (5 day)
Limits are based on plant design and are proposed to continue.

E. coli
WQS for *E. coli* became effective in March 2010, and a compliance schedule is proposed for meeting these new final effluent limits within nine months. The schedule provides time during the summer disinfection season for the plant to evaluate the ability of its existing disinfection system to achieve the new limits and to make operational changes or equipment upgrades if necessary. Based on best technical judgment, it is proposed that the plant comply with its current fecal coliform limits during the interim period.

Total Filterable Residue, Nitrate+Nitrite, Total Kjeldahl Nitrogen, and Phosphorus
Monitoring for these parameters is proposed to continue. The purpose of the monitoring is to obtain data on the level and variability of total filterable residue (dissolved solids) in the effluent. The purpose of monitoring the other parameters is to maintain a nutrient data set for use in the TMDL study and future implementation.

Orthophosphate
New monthly monitoring is proposed for dissolved orthophosphate (as P). This monitoring is required by Ohio Senate Bill 1, which was signed by the Governor on April 2, 2015. Monitoring for orthophosphate is proposed to further develop nutrient datasets for dissolved reactive phosphorus and to assist stream and watershed assessments and studies. Ohio EPA monitoring, as well as other in-stream monitoring, is taken via grab sample, orthophosphate is proposed to be collected by grab sample to maintain consistent data to support watershed and stream surveys. Monitoring will be done by grab sample, which must be filtered within 15 minutes of collection using a 0.45-micron filter. The filtered sample must be analyzed within 48 hours.

Antimony, Arsenic, Beryllium, Iron, Molybdenum, Phenol, Selenium, Strontium, Thallium, and Toluene
The Ohio EPA risk assessment (Table 9) places these parameters in group 2. This placement, as well as the data in Tables 1, 2, and 3, 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 monitoring is proposed.

Barium and Silver
The Ohio EPA risk assessment (Table 9) places these parameters in group 3. This placement, as well as the data in Tables 1, 2, and 3, 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 reduced frequency is proposed to document that these pollutants continue to remain at low levels.

Cadmium, Chromium, Cyanide – Free, Hexavalent Chromium (dissolved), Lead, Nickel, and Zinc
The Ohio EPA risk assessment (Table 9) places these parameters in groups 2 and 3. This placement, as well as the data in Tables 1, 2, and 3, 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 continue to document that these pollutants continue to remain at low levels.

Currently there are two approved methods for free cyanide listed in 40 CFR 136.3 that have quantification levels lower than any water quality-based effluent limits:

- ASTM D7237-10 and OIA-1677-09 - Flow injection followed by gas diffusion amperometry

These methods will allow Ohio EPA 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.

New NPDES permits no longer authorize the use of method 4500 CN-I from Standard Methods for free cyanide testing. The new permits require permittees to begin using one of these approved methods as soon as possible. If a permittee must use method 4500 CN-I during the transition to an approved method, they are instructed to report the results on their DMR and enter "Method 4500 CN-I" in the remarks section.

Copper
The Ohio EPA risk assessment (Table 9) places copper in group 4. This placement, as well as the data in Tables 1, 2, and 3, 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 Rule 3745-33-07(A)(2).

Indeno(1,2,3-cd)pyrene
The Ohio EPA risk assessment (Table 9) places this parameter in group 4. This placement, as well as the data in Tables 1, 2, and 3, 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 Rule 3745-33-07(A)(2).

Bis(2-ethylhexyl)phthalate
The Ohio EPA risk assessment (Table 9) places this parameter in group 5, which recommends limits to protect water quality. This placement, as well as the data in Tables 1, 2, and 3, 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). Part II of the draft permit includes conditions for sampling for this parameter.

Mercury
The Ohio EPA risk assessment (Table 9) places this parameter in group 5. This placement, as well as the data in Tables 1, 2, and 3, 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). Limits are proposed to continue.

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

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.

Additional Monitoring
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.

<u>Other Requirements</u>

Compliance Schedule

An eleven month compliance schedule is proposed to meet the new *E. coli* limits. This will give the permittee one disinfection season (summer) to determine how to meet the limits.

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
Operator certification requirements have been included in Part II of the permit in accordance with rules adopted in December 2006. These rules require the Tri-Cities WWTP to have a Class IV wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001.

Operator of Record
In December 2006, OAC rule revisions became effective that affect the requirements for certified operators for sewage collection systems and treatment works regulated under NPDES permits. Part II of this NPDES permit is included to implement OAC 3745-7-02. It requires 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 Tri-Cities North Regional Wastewater Authority 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 Tri-Cities North Regional Wastewater Authority 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 a sign at each outfall to the Great Miami River providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

Figure 1. Approximate Location of the Facility

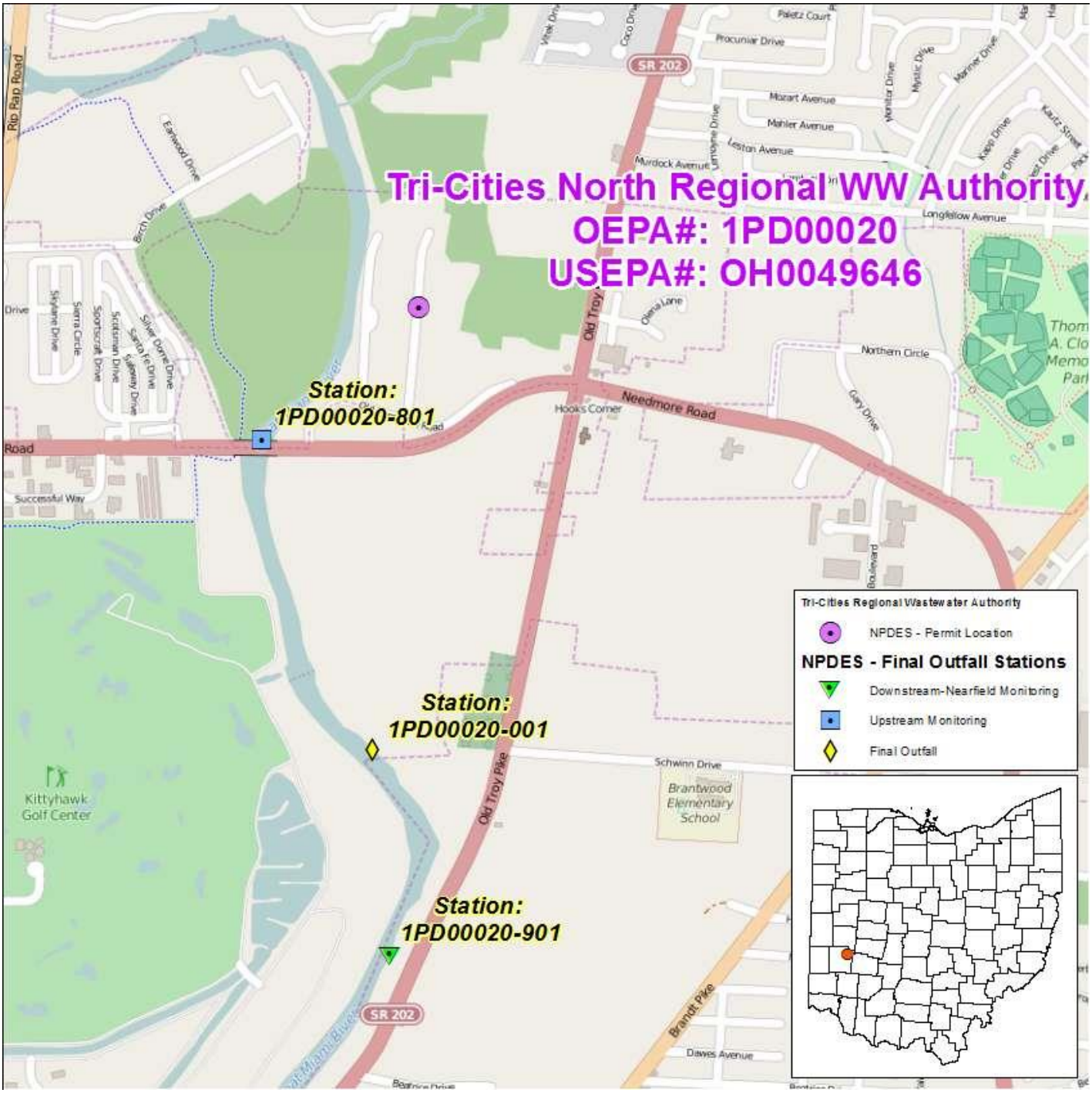

Figure 2. Great Miami River Study Area (Upstream Section)

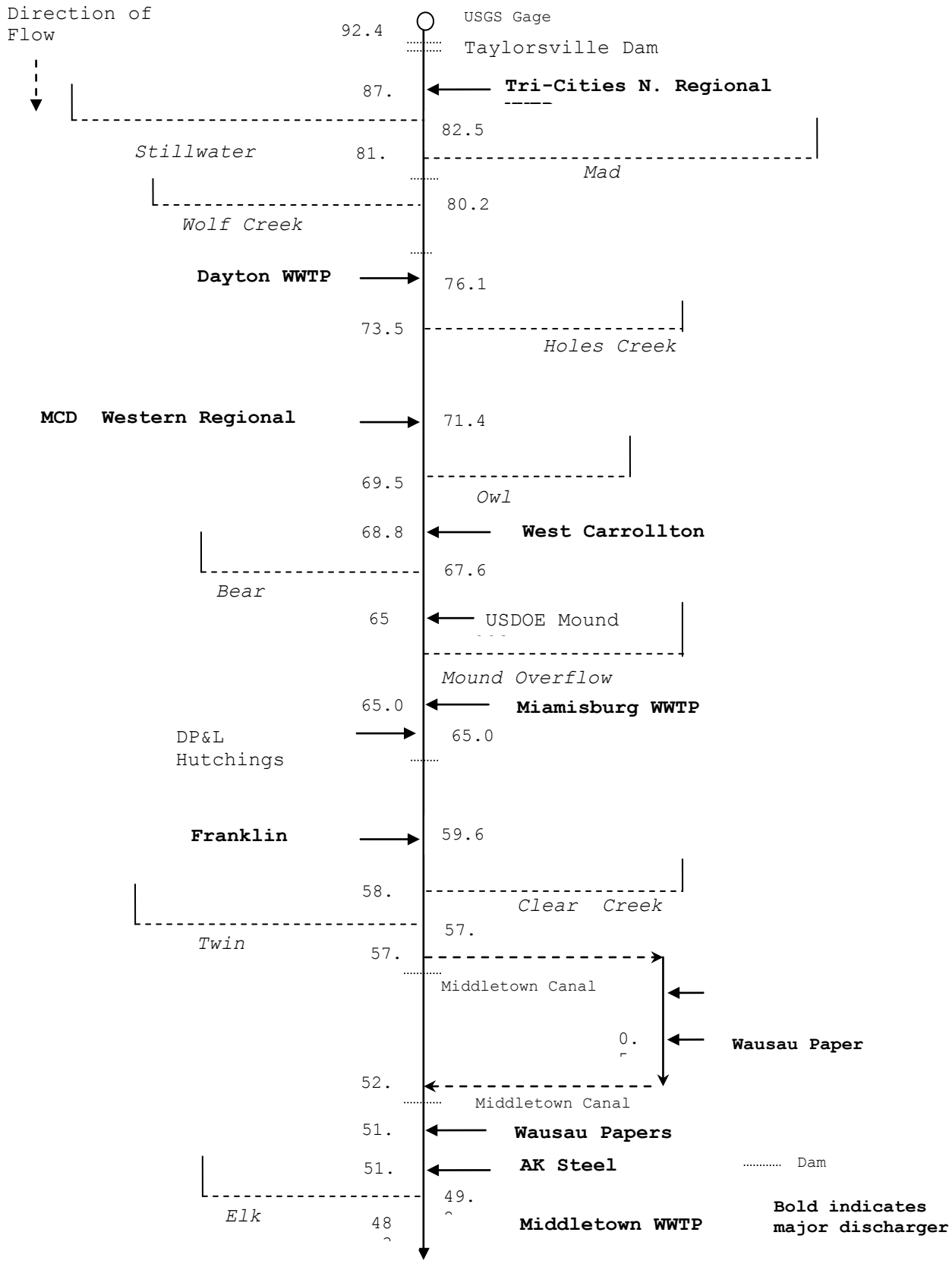

Table 1. Effluent Characterization Using Ohio EPA Bioassay and Pretreatment Data

Parameter	Units	OEPA	OEPA	PT	PT	PT	PT
		4/30/2012	12/12/2011	2/28/2012	3/29/2011	3/17/2010	3/3/2009
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	11	12	NA	NA	NA	NA
Total Filterable Residue (Dissolved Solids)	mg/L	786	728	NA	NA	NA	NA
Total Suspended Solids	mg/L	8	17	NA	NA	NA	NA
Arsenic	µg/L	2.4	ND (2)	ND (5)	ND (5)	ND (5)	ND (5)
Barium	µg/L	77	95	NA	NA	NA	NA
Copper	µg/L	13.8	12	20.7	15.2	10.5	16.2
Iron	µg/L	312	342	NA	NA	NA	NA
Magnesium	mg/L	33	33	NA	NA	NA	NA
Manganese	µg/L	47	53	NA	NA	NA	NA
Nickel	µg/L	3.5	3.5	ND (5)	ND (5)	ND (5)	ND (5)
Strontium	µg/L	770	572	NA	NA	NA	NA
Zinc	µg/L	19	37	29.3	19.3	22.9	26.6
Ammonia	mg/L	0.185	0.944	NA	NA	NA	NA
Chemical Oxygen Demand	mg/L	49	37	NA	NA	NA	NA
Chloride	mg/L	226	155	NA	NA	NA	NA
Nitrate+Nitrite	mg/L	12.8	9.55	NA	NA	NA	NA
Total Kjeldahl Nitrogen	mg/L	1.56	3.47	NA	NA	NA	NA
Phosphorus	mg/L	2.45	0.13	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	µg/L	18.6	ND (5.3)	17.1	46.7	15.4	6.54
Phenol	µg/L	3.7	ND (2.1)	ND (10)	ND (10)	ND (10)	ND (10)
Toluene	µg/L	0.64	ND (0.5)	ND (5)	ND (5)	ND (5)	ND (2)
Indeno(1,2,3-cd)pyrene	µg/L	ND (2.1)	ND (2.1)	ND (0.22)	ND (0.22)	3.82	ND (0.22)
2,4, -dimethyl-1-heptene	µg/L	NA	NA	32.8	NA	NA	NA
2-Cyclohexen-1-one	µg/L	NA	NA	NA	121	NA	NA
9-Octadecenoic acid, (E)-(01)	µg/L	NA	NA	NA	102	NA	NA
9-Octadecenoic acid, (E)-(04)	µg/L	NA	NA	NA	228	NA	NA
Cholestanol	µg/L	NA	NA	NA	94.8	NA	NA
Cholesterol	µg/L	NA	NA	NA	148	NA	10.3
Cyclohexanol	µg/L	NA	NA	40	NA	NA	NA
Cyclohexene	µg/L	NA	NA	708	NA	NA	NA
Dodecanoic acid	µg/L	NA	NA	NA	84	NA	NA
Hexadecanoic acid	µg/L	NA	NA	37.5	478	NA	NA
Octadecanoic acid	µg/L	NA	NA	NA	192	15.4	NA
Squalene	µg/L	NA	NA	NA	80.2	NA	NA
Tetradecanoic acid	µg/L	NA	NA	NA	79.6	NA	NA

Summary of analytical results for Tri-Cities North Regional WWTP outfall 1PD00020001. PT = Pretreatment data. OEPA = data from Ohio EPA bioassays. ND = below detection (detection limit). NA = not analyzed.

Table 2. 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	°C	MONITOR		1996	16.2	23.6	6.2-25.1
Dissolved Oxygen	Summer	mg/L	5.0 Minimum		1048	7.9	9.38	5.4-10.5
Dissolved Oxygen	Winter	mg/L	5.0 Minimum		945	9.8	11.4	5-14.2
Total Filterable Residue (Dissolved Solids)	Annual	mg/L	MONITOR		50	755	794	663-937
Total Suspended Solids	Annual	mg/L	18	27[a]	1391	7	12.9	3-30
		kg/day	763	1146[a]	-	-	-	-
Oil and Grease	Annual	mg/L	10 Maximum		137	0	3.63	0-4.4
Ammonia	Summer	mg/L	1.5	2.3[a]	761	0.5	4.3	0-12.3
		kg/day	64	96[a]	-	-	-	-
	Winter	mg/L	2.5	3.8[a]	660	0.24	2.21	0.02-8.84
		kg/day	106	159[a]	-	-	-	-
Total Kjeldahl Nitrogen	Annual	mg/L	MONITOR		69	2.6	8.93	0-17.5
Nitrite + Nitrate	Annual	mg/L	MONITOR		138	12.2	18.6	2.9-23.1
Phosphorus	Annual	mg/L	MONITOR		292	2.42	3.2	1-4.3
Cyanide, Free	Annual	mg/L	MONITOR		69	0	0	0-0.017
Barium	Annual	µg/L	MONITOR		50	79.8	95	0.08-97.3
Nickel	Annual	µg/L	MONITOR		69	0	0	0-0
Silver	Annual	µg/L	MONITOR		69	0	0.8	0-1
Zinc	Annual	µg/L	MONITOR		69	24.1	33.1	0-65
Cadmium	Annual	µg/L	MONITOR		69	0	0	0-0
Lead	Annual	µg/L	MONITOR		69	0	0	0-0
Chromium	Annual	µg/L	MONITOR		69	0	0	0-0
Copper	Annual	µg/L	MONITOR		69	20.2	27	14.3-43.3
Hexavalent Chromium (Dissolved)	Annual	µg/L	MONITOR		69	0	0	0-0

Parameter	Season	Units	Current Permit Limits		#	Percentiles		Data
			30 day	Daily	Obs.	50th	95th	Range
Fecal Coliform	Annual	#/100 mL	1000	2000[a]	736	116	1040	0-11000
Bis(2-ethylhexyl)phthalate	Annual	µg/L	MONITOR		50	0	6	0-15.5
Flow Rate	Annual	MGD	MONITOR		2028	7.72	13.5	0.373-39.7
Chlorine, Total Residual	Annual	mg/L	--	0.037	740	0	0.001	0-0.028
Mercury	Annual	ng/L	12	1700	70	5.65	12.2	0-21.6
		kg/day	0.0005	0.072	--	--	--	--
Acute Toxicity, *Ceriodaphnia dubia*	Annual	TUa	MONITOR		4	0	0	0-0
Chronic Toxicity, *Ceriodaphnia dubia*	Annual	TUc	MONITOR		4	0	0	0-0
Acute Toxicity, *Pimephales promelas*	Annual	TUa	MONITOR		4	0	0	0-0
Chronic Toxicity, *Pimephales promelas*	Annual	TUc	MONITOR		4	0	0	0-0
pH, Maximum	Annual	S.U.	--	9.0	1997	8.1	8.4	7.3-8.98
pH, Minimum	Annual	S.U.	--	6.5	1999	7.8	8.14	6.8-8.51
Carbonaceous Biochemical Oxygen Demand (5 day)	Summer	mg/L	12	18[a]	737	7	11	2-14.9
	Winter	mg/L	12	18[a]	651	7.62	11.4	3.96-15.8
	Annual	kg/day	509	763[a]	--	--	--	--
<u>Sanitary Sewer Overflow Station 300</u>								
Overflow Occurrence	Annual	#/Month	MONITOR		39	1	8.2	1-22
<u>Sludge Station 581</u>								
Ammonia	Annual	mg/kg	MONITOR		103	56600	106000	14000-168000
Total Kjeldahl Nitrogen	Annual	mg/kg	MONITOR		93	69300	131000	7.4-161000

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Arsenic	Annual	mg/kg	75 Maximum		44	8.05	23.8	0-28.1
Cadmium	Annual	mg/kg	85 Maximum		26	3.16	5.25	0-6.19
Copper	Annual	mg/kg	4300 Maximum		23	800	951	0-1010
Lead	Annual	mg/kg	840 Maximum		22	43.4	59.1	1.12-67.4
Nickel	Annual	mg/kg	420 Maximum		22	24.5	29.8	0-33.6
Zinc	Annual	mg/kg	7500 Maximum		22	1120	1390	0-1530
Selenium	Annual	mg/kg	100 Maximum		22	0	7.52	0-7.97
Sludge Fee Weight	Annual	Dry Tons	MONITOR		16	206	370	13.6-457
Sludge Weight	Annual	Dry Tons	MONITOR		85	12.2	278	1.7-457
Mercury	Annual	mg/kg	57 Maximum		22	1.29	19.7	0-26.3
Molybdenum	Annual	mg/kg	75 Maximum		21	17.7	23.4	0-23.4
Sludge Station 586								
Sludge Fee Weight	Annual	Dry Tons	MONITOR		3	782	808	646-811
Internal Monitoring Station 601								
Total Suspended Solids	Annual	mg/L	MONITOR		1419	145	195	33-298
Cyanide, Total	Annual	mg/L	MONITOR		70	0	0	0-0.08
Nickel	Annual	µg/L	MONITOR		69	0	5.42	0-8
Silver	Annual	µg/L	MONITOR		69	0.9	4	0-9.6
Zinc	Annual	µg/L	MONITOR		69	94	132	17.1-168
Cadmium	Annual	µg/L	MONITOR		69	0	0.56	0-2.6
Lead	Annual	µg/L	MONITOR		69	0	5.32	0-7.2
Chromium	Annual	µg/L	MONITOR		69	0	0	0-32.7
Copper	Annual	µg/L	MONITOR		69	79.5	107	0-135
Hexavalent Chromium (Dissolved)	Annual	µg/L	MONITOR		70	0	0	0-186
Mercury	Annual	ng/L	MONITOR		69	76.7	349	1.4-492

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
pH, Maximum	Annual	S.U.	MONITOR		1459	7.7	7.8	7.3-8.4
pH, Minimum	Annual	S.U.	MONITOR		1459	7.6	7.7	6.7-7.8
Carbonaceous Biochemical Oxygen Demand (5 day)	Summer	mg/L	MONITOR		724	154	194	23-220
	Winter	mg/L	MONITOR		695	124	195	25-252
<u>Upstream Monitoring Station 801</u>								
Water Temperature	Annual	℃	MONITOR		69	16.2	25.3	0-45
Dissolved Oxygen	Summer	mg/L	MONITOR		35	7.95	9.56	5.64-11
Dissolved Oxygen	Winter	mg/L	MONITOR		34	11.9	15.1	6.4-15.4
pH	Annual	S.U.	MONITOR		69	8.2	8.56	7.5-8.9
Nitrogen, Ammonia (NH3)	Summer	mg/L	MONITOR		35	0.04	0.1	0-0.16
Nitrogen, Ammonia (NH3)	Winter	mg/L	MONITOR		34	0.055	0.204	0-0.29
Fecal Coliform	Annual	#/100 mL	MONITOR		35	154	600	54-1420
Acute Toxicity, *Ceriodaphnia dubia*	Annual	% Affected	MONITOR		4	0	0	0-0
Chronic Toxicity, *Ceriodaphnia dubia*	Annual	% Affected	MONITOR		4	8.5	14.6	2-15
Acute Toxicity, *Pimephales promelas*	Annual	% Affected	MONITOR		4	0	0	0-0
Chronic Toxicity, *Pimephales promelas*	Annual	% Affected	MONITOR		4	15	29.3	5-30
<u>Downstream Monitoring Station 901</u>								
Water Temperature	Annual	℃	MONITOR		69	13.6	25.1	0.7-26.7
Dissolved Oxygen	Summer	mg/L	MONITOR		35	8.05	10.2	6.25-11.4
Dissolved Oxygen	Winter	mg/L	MONITOR		34	12.1	14.8	6.6-15.2

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
pH	Annual	S.U.	MONITOR		69	8.2	8.6	7.7-8.9
Ammonia	Summer	mg/L	MONITOR		35	0.08	0.3	0.02-0.82
	Winter	mg/L	MONITOR		34	0.085	0.262	0-1.11
Total Kjeldahl Nitrogen	Annual	mg/L	MONITOR		69	1.17	2.48	0-4.52
Phosphorus	Annual	mg/L	MONITOR		69	0.358	0.636	0.138-289
Cyanide, Total	Annual	mg/L	MONITOR		69	0	0	0-0.02
Hardness	Annual	mg/L	MONITOR		69	285	337	177-344
Nickel	Annual	µg/L	MONITOR		69	0	3.48	0-9.4
Zinc	Annual	µg/L	MONITOR		69	0	27.2	0-45.6
Cadmium	Annual	µg/L	MONITOR		69	0	0	0-1.1
Lead	Annual	µg/L	MONITOR		69	0	0	0-15.2
Chromium	Annual	µg/L	MONITOR		69	0	0	0-9.7
Copper	Annual	µg/L	MONITOR		69	0	8.52	0-10.9
Hexavalent Chromium (Dissolved)	Annual	µg/L	MONITOR		69	0	0	0-0
Fecal Coliform	Annual	#/100 mL	MONITOR		35	108	1000	40-1630

*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 3. Projected Effluent Quality Values

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Self-Monitoring (DMR) Data					
Total Filterable Residue (dissolved solids)[A]	mg/L	52	52	797	840
Ammonia (Summer)	mg/L	530	528	2.33	5.37
Ammonia (Winter)	mg/L	335	335	1.13	2.67
Nitrate + Nitrite[A]	mg/L	140	140	16.3	20.4
Phosphorus[A]	mg/L	294	294	3.22	4.13
Cyanide, free	µg/L	68	2	12.4	17.0
Barium[A]	µg/L	52	52	93.4	108
Nickel[A]	µg/L	75	2	3.29	4.50
Silver	µg/L	69	14	0.597	0.874
Zinc[A]	µg/L	75	74	31.5	38.8
Cadmium	µg/L	69	0	--	--
Lead	µg/L	69	0	--	--
Chromium	µg/L	69	0	--	--
Copper[A]	µg/L	75	75	24.4	29.1
Hexavalent Chromium (Dissolved)	µg/L	69	0	--	--
Bis(2-ethylhexyl)phthalate[A,C]	µg/L	56	23	34.1	46.7
Chlorine, Total Residual	µg/L	740	17	12.3	16.8
Mercury	ng/L	70	67	11.5	17.5
Combined Other Data[B]					
Arsenic	µg/L	6	1	6.66	9.12
Iron	µg/L	2	2	949	1300
Magnesium	mg/L	2	2	91.5	125
Manganese	µg/L	2	2	147	201
Strontium	µg/L	2	2	2136	2926
Chloride	mg/L	2	2	627	859
Phenol	µg/L	6	1	10.3	14.1
Toluene	µg/L	6	1	1.78	2.43
Indeno(1,2,3,-cd)pyrene	µg/L	6	1	5.86	8.02
2,4-dimethyl-1-heptene	µg/L	1	1	148	203
2-Cyclohexen-1-one	µg/L	1	1	548	750
9-Octadecenoic acid, (E)-(01)	µg/L	1	1	462	632
9-Octadecenoic acid, (E)-(04)	µg/L	1	1	1032	1414
Cholestanol	µg/L	1	1	429	588
Cholesterol	µg/L	1	1	411	562
Cyclohexanol	µg/L	1	1	181	248

Cyclohexene	µg/L	1	1	3204	4390
Dodecanoic acid	µg/L	1	1	380	521
Hexadecanoic acid	µg/L	2	2	1326	1816
Octadecanoic acid	µg/L	2	2	533	730
Squalene	µg/L	1	1	363	497
Tetradecanoic acid	µg/L	1	1	360	494

DMR = discharge monitoring report
MDL = analytical method detection limit
PEQ = projected effluent quality

Table 4. Summary of Whole Effluent Toxicity Screening and Results

Table 4a. Ohio EPA Bioassay Screening Results

	Ceriodaphnia dubia								*Pimephales promelas*							
	24 Hours				48 Hours				24 Hours				48 Hours			
Collection Date	**UP**	**C**	**%M**	**TU_a**	**UP**	**C**	**%M**	**TU_a**	**UP**	**C**	**%M**	**TU_a**	**UP**	**C**	**%M**	**TU_a**
12/12/2011	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND
12/13/2011	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND
12/13/11-12/14/11[a]	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND
4/30/2012	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND
5/1/2012	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND
4/30/12-5/1/12[a]	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND

[a] = 24-hour composite sample

C = laboratory control water

%M = percent mortality in 100% effluent

ND = not determined

TUa = acute toxicity units

UP = percent mortality in upstream control water

Table 4b. Facility Whole Effluent Toxicity Test Results

	Ceriodaphnia dubia		*Pimephales promelas*	
Date	**Acute Toxicity (TU_a)**	**Chronic Toxicity (TU_c)**	**Acute Toxicity (TU_a)**	**Chronic Toxicity (TU_c)**
6/18/2010	AA	AA	AA	AA
6/20/2011	AA	AA	AA	AA
6/19/2012	AA	AA	AA	AA
6/1/2013	AA	AA	AA	AA

AA = not detected (limit 0.2)

TU_a = acute toxicity unit

TU_c = chronic toxicity unit

Table 5. Summary of the Great Miami River Mainstem Use Designation Status and Causes/Sources of Impairment, 2009-10 Surveys

Location	RM	Use Designation	Attainment Status	Causes of Impairment	Sources of Impairment
Upst. Tri-Cities N. WWTP	87.7	EWH	FULL		
Dst. Tri-Cities N. WWTP	85.8	EWH	PARTIAL	Ammonia (modest toxicity)	Major WWTP (Tri-Cities N. WWTP)
Upst. Mad River to Dst. Bear Creek	82.1 to 66.9	WWH	FULL		
Dst. DP&L Hutchings discharge	64.1	WWH	PARTIAL	Temperature	Industrial Thermal Discharges (DP&L)
Further Dst. DP&L to Dst. Franklin WWTP	62.6 to 58.2	WWH	FULL		
Middletown area	52.6	WWH	PARTIAL	Nutrients	Livestock (grazing or feeding operations), Crop production (crop land or dry land), Municipal point sources
Dst. Wausau Papers to Just Upst. Hamilton WWTP	51.6 to 34.2	WWH	FULL		
Dst. Hamilton WWTP	33.6	WWH	PARTIAL	Temperature	Industrial thermal discharges (Hamilton Muni-Electric Plant)
Upst. Fairfield WWTP to Upst. Banklick Creek	32.7 to 28.7	WWH	PARTIAL	Nutrients, Biochemical Oxygen Demand	Livestock (grazing or feeding operations), Crop production (crop land or dry land), Municipal point sources
Dst. Indian Creek to Upst. Taylor Creek WWTP	26.1 to 15.5	WWH	FULL		
Dst. Taylor Creek WWTP	14.8	WWH	PARTIAL	Nutrients, Biochemical Oxygen Demand	Livestock (grazing or feeding operations), Crop production (crop land or dry land), Municipal point sources
Upst. Whitewater River	8.2	WWH	FULL		

DP&L = Dayton Power and Light
Dst = downstream
EWH = exceptional warmwater habitat
Tri-Cities N = Tri-Cities Northern Regional Wastewater Authority
WWH = warmwater habitat
WWTP = wastewater treatment plant
Upst = upstream

Table 6. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Antimony	µg/L	4300	--	190	900	1800
Arsenic	µg/L	--	100	150	340	680
Barium	µg/L	--	--	220	2000	4000
Benzene[C]	µg/L	710	--	160	700	1400
3,4-Benzofluoranthene[D]	µg/L	0.49	--	--	--	--
Benzo(a)pyrene[C]	µg/L	0.49	--	--	--	--
Beryllium A	µg/L	280	100	65	560	1100
Bis(2-ethylhexyl)phthalate[C]	µg/L	59	--	8.4	1100	2100
Boron	µg/L	--	--	3900	33000	65000
Bromodichloromethane[C]	µg/L	460	--	--	--	--
Cadmium[A]	µg/L	--	50	5.9	16	32
Chlorine, Total Residual	µg/L	--	--	11	19	38
Chlorobenzene	µg/L	21000	--	47	420	850
Chloroform[C]	µg/L	4700	--	140	1300	2600
Hexavalent Chromium (dissolved)	µg/L	--	--	11	16	31
Chromium[A]	µg/L	--	100	210	4500	8900
Copper[A]	µg/L	1300	500	24	40	80
Cyanide, free	µg/L	220000	--	12	46	92
Dibromochloromethane[C]	µg/L	340	--	--	--	--
Dibenzo(a,h)anthracene[C]	µg/L	0.49	--	--	--	--
1,2-Dichloroethane[C]	µg/L	990	--	2000	9600	19000
1,1-Dichloroethylene[C]	µg/L	32	--	210	1900	3800
2,4-Dimethylphenol	µg/L	2300	--	15	140	280
Ethylbenzene	µg/L	29000	--	61	550	1100
Fluoride	µg/L	--	2000	--	--	--
Heptachlor Epoxide[C]	µg/L	0.0011	--	--	--	--
Hexachlorobenzene[B,C]	µg/L	0.0077	--	--	--	--
Ideno(1,2,3-c,d)pyrene[C]	µg/L	0.49	--	--	--	--
Iron	µg/L	--	5000	--	--	--
Lead[A]	µg/L	--	100	26	500	1000
Mercury[B]	µg/L	12	10000	910	1700	3400
Molybdenum	µg/L	--	--	20000	190000	370000
Naphthalene	µg/L	--	--	21	170	340
Nickel[A]	µg/L	4600	200	130	1200	2400
Nitrate+Nitrite	mg/L	--	100	--	--	--
Phenol	µg/L	4600000	--	400	4700	9400

Selenium	µg/L	11000	50	5	--	--
SilverA	µg/L	--	--	1.3	11	22
Strontium	µg/L	--	--	21000	40000	81000
Tetrachloroethylene[C]	µg/L	89	--	53	430	850
Thallium	µg/L	6.3	--	17	79	160
Toluene	µg/L	200000	--	62	560	1100
Total Filterable Residue (dissolved solids)[A]	mg/L	--	--	1500	--	--
1,2,4-Trimethylbenzene	µg/L	--	--	15	140	280
Xylenes	µg/L	--	--	27	240	480
Zinc[A]	µg/L	69000	25000	310	310	610

[A] Aquatic Life Criteria is hardness-based.

[B] Bioaccumulative Chemical of Concern

[C] Carcinogen

[D] Use Criteria for Benzo(b)fluoranthene

Table 7. Instream Conditions and Discharger Flow

Parameter	Units		Value	Basis
Upstream Flows *GMR at Taylorsville*				
7Q10	cfs	annual	58.4	USGS gage #03263000, 1970-2012 data
1Q10	cfs	annual	42	USGS gage #03263000, 1970-2012 data
30Q10	cfs	summer	73	USGS gage #03263000, 1970-2012 data
		winter	180.3	USGS gage #03263000, 1970-2012 data
Harmonic Mean Flow	cfs	annual	299.9	USGS gage #03263000, 1970-2012 data
Mixing Assumption	%	average	100	Stream-to-discharge ratio
(GMR & Tribs.)	%	maximum	100	Stream-to-discharge ratio
Stillwater River at Mouth				
7Q10	cfs	annual	24.2	USGS gage #03266000, 1970-2012 data
1Q10	cfs	annual	20.4	USGS gage #03266000, 1970-2012 data
30Q10	cfs	summer	29.8	USGS gage #03266000, 1970-2012 data
		winter	79.4	USGS gage #03266000, 1970-2012 data
Harmonic Mean Flow	cfs	annual	143.3	USGS gage #03266000, 1970-2012 data
Mad River at Mouth				
7Q10	cfs	annual	177.8	USGS gage #03270000, 1970-2012 data
1Q10	cfs	annual	166.9	USGS gage #03270000, 1970-2012 data
30Q10	cfs	summer	210	USGS gage #03270000, 1970-2012 data
		winter	264.7	USGS gage #03270000, 1970-2012 data
Harmonic Mean Flow	cfs	annual	482.7	USGS gage #03270000, 1970-2012 data
Wolf Creek at Mouth				
7Q10	cfs	annual	5.13	USGS gage #03271000, 1986-2012 data
1Q10	cfs	annual	4.18	USGS gage #03271000, 1986-2012 data
30Q10	cfs	summer	5.77	USGS gage #03271000, 1986-2012 data
		winter	14.1	USGS gage #03271000, 1986-2012 data
Harmonic Mean Flow	cfs	annual	23.3	USGS gage #03271000, 1986-2012 data
Twin Creek at Mouth				
7Q10	cfs	annual	5.04	USGS gage #03272000, 1970-2012 data
1Q10	cfs	annual	4.5	USGS gage #03272000, 1970-2012 data
30Q10	cfs	summer	7.26	USGS gage #03272000, 1970-2012 data
		winter	32.4	USGS gage #03272000, 1970-2012 data
Harmonic Mean Flow	cfs	annual	44.9	USGS gage #03272000, 1970-2012 data
Four Mile Creek at Mouth				
7Q10	cfs	annual	6.67	USGS gage #03272700, 1970-2012 data

1Q10	cfs	annual	5.84	USGS gage #03272700, 1970-2012 data
30Q10	cfs	summer	8.9	USGS gage #03272700, 1970-2012 data
		winter	24.6	USGS gage #03272700, 1970-2012 data
Harmonic Mean Flow	cfs	annual	50.2	USGS gage #03272700, 1970-2012 data
Holes Creek at Mouth				
7Q10	cfs	annual	1.16	USGS gage #03271300, 2002-2012 data
1Q10	cfs	annual	1.13	USGS gage #03271300, 2002-2012 data
30Q10	cfs	summer	3.54	USGS gage #03271300, 2002-2012 data
		winter	11.9	USGS gage #03271300, 2002-2012 data
Harmonic Mean Flow	cfs	annual	9.07	USGS gage #03272000, 2002-2012 data
Indian Creek at Mouth				
7Q10	cfs	annual	0.2	USGS gage #03274200, 1961-69 data
1Q10	cfs	annual	0.2	USGS gage #03274200, 1961-69 data
30Q10	cfs	summer	0.3	USGS gage #03274200, 1961-69 data
		winter	0.8	USGS gage #03274200, 1961-69 data
Harmonic Mean Flow	cfs	annual	1.17	USGS gage #03272800, 1960-72 data
Clear Creek at Mouth				
7Q10	cfs	annual	0.4	USGS gage #03271700, 1959-69 data
1Q10	cfs	annual	0.4	USGS gage #03271700, 1959-69 data
30Q10	cfs	summer	0.6	USGS gage #03271700, 1959-69 data
		winter	2.5	USGS gage #03271700, 1959-69 data
Harmonic Mean Flow	cfs	annual	3	USGS gage #03272000, 1970-2012 data
Elk Creek at Mouth				
7Q10	cfs	annual	0.4	USGS gage #03272200, 1960-67 data
1Q10	cfs	annual	0.4	USGS gage #03272200, 1960-67 data
30Q10	cfs	summer	0.6	USGS gage #03272200, 1960-67 data
		winter	2.1	USGS gage #03272200, 1960-67 data
Harmonic Mean Flow	cfs	annual	3	USGS gage #03272000, 1970-2012 data
Bear Creek at Mouth				
7Q10	cfs	annual	0.85	USGS gage #03272000, 1970-2012 data
1Q10	cfs	annual	0.76	USGS gage #03272000, 1970-2012 data
30Q10	cfs	summer	1.23	USGS gage #03272000, 1970-2012 data
	cfs	winter	5.48	USGS gage #03272000, 1970-2012 data
Harmonic Mean Flow	cfs	annual	7.59	USGS gage #03272000, 1970-2012 data
Gregory Creek at Mouth				
7Q10	cfs	annual	0.26	USGS gage #03272200, 1960-67 data

1Q10	cfs	annual	0.26	USGS gage #03272200, 1960-67 data
30Q10	cfs	summer	0.39	USGS gage #03272200, 1960-67 data
		winter	1.35	USGS gage #03272200, 1960-67 data
Harmonic Mean Flow	cfs	annual	1.93	USGS gage #03272000, 1970-2012 data
Pleasant Run at Mouth				
7Q10	cfs	annual	0.04	USGS gage #03274200, 1961-69 data
1Q10	cfs	annual	0.04	USGS gage #03274200, 1961-69 data
30Q10	cfs	summer	0.06	USGS gage #03274200, 1961-69 data
		winter	0.16	USGS gage #03274200, 1961-69 data
Harmonic Mean Flow	cfs	annual	0.23	USGS gage #03272800, 1960-72 data
Banklick Creek at Mouth				
7Q10	cfs	annual	0.01	USGS gage #03274200, 1961-69 data
1Q10	cfs	annual	0.01	USGS gage #03274200, 1961-69 data
30Q10	cfs	summer	0.02	USGS gage #03274200, 1961-69 data
		winter	0.05	USGS gage #03274200, 1961-69 data
Harmonic Mean Flow	cfs	annual	0.07	USGS gage #03272800, 1960-72 data
Twomile Creek at Mouth				
7Q10	cfs	annual	0.02	USGS gage #03274200, 1961-69 data
1Q10	cfs	annual	0.02	USGS gage #03274200, 1961-69 data
30Q10	cfs	summer	0.02	USGS gage #03274200, 1961-69 data
		winter	0.06	USGS gage #03274200, 1961-69 data
Harmonic Mean Flow	cfs	annual	0.1	USGS gage #03272800, 1960-72 data
Paddy's Run at Mouth				
7Q10	cfs	annual	0.03	USGS gage #03274200, 1961-69 data
1Q10	cfs	annual	0.03	USGS gage #03274200, 1961-69 data
30Q10	cfs	summer	0.05	USGS gage #03274200, 1961-69 data
		winter	0.13	USGS gage #03274200, 1961-69 data
Harmonic Mean Flow	cfs	annual	0.19	USGS gage #03272800, 1960-72 data
Tri-Cities North R WWTP				
Outfall 001 flow rate	cfs (MGD)	avg.	17.33 (11.2)	NPDES permit application
Background Water Quality for the Great Miami River				
Antimony	µg/L	annual	0	No representative data available.
Arsenic	µg/L	annual	1	STORET; 18 values,10 <MDL, 2009-10
Barium	µg/L	annual	92	STORET; 18 values, 0 <MDL, 2009-10
Benzene	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Benzo(a)pyrene	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009

3,4-Benzofluoranthene	µg/L	annual	0	No representative data available.
Beryllium	µg/L	annual	0	No representative data available.
Bis(2-ethylhexyl)phthalate	µg/L	annual	0.66	STORET; 5 values, 3 <MDL, 2009
Boron	µg/L	annual	0	No representative data available.
Cadmium	µg/L	annual	0	STORET; 18 values,18 <MDL, 2009-10
Chlorine, Total Residual	µg/L	annual	0	No representative data available.
Chlorobenzene	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Chloroform	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Hexavalent Chromium (dissolved)	µg/L	annual	0	No representative data available.
Chromium	µg/L	annual	1	STORET; 18 values,17<MDL, 2009-10
Copper	µg/L	annual	2.1	STORET; 18 values, 5<MDL, 2009-10
Cyanide, Free	µg/L	annual	0	No representative data available.
Dibenzo(a,h)anthracene	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
1,2-Dichloroethane	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
1,1-Dichloroethylene	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
2,4-Dimethylphenol	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Ethylbenzene	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Fluoride	µg/L	annual	0	No representative data available.
Heptachlor epoxide	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Hexachlorobenzene	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Indeno(1,2,3-c,d)pyrene	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Iron	µg/L	annual	468	STORET; 18 values, 0<MDL, 2009-10
Lead	µg/L	annual	1	STORET; 18 values, 17<MDL, 2009-10
Mercury	ng/L	annual	0	No representative data available.
Molybdenum	µg/L	annual	0	No representative data available.
Napthalene	µg/L	annual	0	STORET; 6 values, 6 <MDL, 2009
Nickel	µg/L	annual	2.95	STORET; 18 values, 0<MDL, 2009-10
Nitrate+Nitrite	mg/L	annual	1.26	STORET; 26 values, 2<MDL, 2009-10
Phenols	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Selenium	µg/L	annual	0	STORET; 18 values,18 <MDL, 2009-10
Silver	µg/L	annual	0	No representative data available.
Total Filterable Residue (dissolved solids)	mg/L	annual	412	STORET; 26 values, 0<MDL, 2009-10
Tetrachloroethylene	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Thallium	µg/L	annual	0	No representative data available.
Toluene	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
1,2,4-Trimethylbenzene	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Xylenes	µg/L	annual	0	STORET; 3 values, 3 <MDL, 2009
Zinc	µg/L	annual	5	STORET; 18 values, 13<MDL, 2009-10

DMR = Discharge Monitoring Report

GMR = Great Miami River
MDL = method detection limit
NPDES = National Pollutant Discharge Elimination System
STORET = United States Environmental Protection Storage and Retrieval Database
USGS = United States Geological Survey

Table 8. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Antimony[B]	µg/L	78740[A]	--	830	3081[A]	1800
Arsenic[B]	µg/L	--	399	276	596	680
Barium	µg/L	--	--	330	3614	4000
Beryllium[B]	µg/L	5127[A]	1813[A]	284	1917[A]	1100
Bis(2-ethylhexyl)phthalate	µg/L	322	--	21	2625[A]	2100
Cadmium[B]	µg/L	--	198[A]	11	28	32
Chlorine, Total Residual	µg/L	--	--	21	35	38
Chromium, total[B]	µg/L	--	397	387	7907	8900
Hexavalent Chromium (dissolved)[B]	µg/L	--	--	23	32[A]	31
Copper	µg/L	3941[A]	1514[A]	37	60	80
Cyanide, free	µg/L	1435000A	--	30	108A	92
Ideno(1,2,3-c,d)pyrene	µg/L	9.0	--	--	--	--
Lead[B]	µg/L	--	377	45	829	1000
Mercury[C]	ng/L	12	10000[A]	910	1700	3400
Molybdenum[B]	µg/L	--	--	42720	385300[A]	370000
Nickel[B]	µg/L	18190[A]	781	236	2092	2400
Phenol[B]	µg/L	84200000[A]	--	1748	16090[A]	9400
Selenium[B]	µg/L	46960	213	7.6	--	--
Silver	µg/L	--	--	2.3	18	22
Total Filterable Residue (dissolved solids)	mg/L	--	--	2360	--	--
Thallium[B]	µg/L	115	--	74	270A	160
Zinc[B]	µg/L	25750[A]	93340[A]	533	507	610

A = Allocation must not exceed the Inside Mixing Zone Maximum.
B = This parameter would not require a WLA based on reasonable potential procedures, but allocation requested because parameter is a priority pollutant.
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 3745-2-08(L).

Table 9. Parameter Assessment for Outfall 001

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

Chloride	Cholestanol	Cholesterol
Cyclohexanol	2-Cyclohexen-1-one	Cyclohexene
2,4-dimethyl-1-heptene	Hexadecanoic acid	Dodecanoic acid
Magnesium	Manganese	Octadecanoic acid
9-Octadecenoic acid, (E)-(01)	9-Octadecenoic acid, (E)-(04)	
Squalene	Tetradecanoic acid	

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

Antimony	Arsenic	Beryllium
Cadmium	Hexavalent Chromium (dissolved)	Chromium
Iron	Lead	Molybdenum
Nickel	Nitrate+Nitrite	Phenol
Selenium	Strontium	Thallium
Toluene	Zinc	

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

Ammonia (winter)	Barium	Cyanide, Free
Silver	Total Filterable Residue (dissolved solids)	

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

Chlorine, Total Residual	Indeno(1,2,3,-cd)pyrene	Copper

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

Limits to Protect Numeric Water Quality Criteria

			Recommended Effluent Limits	
Parameter	*Units*	*Applicable Period*	*Average*	*Maximum*
Ammonia	mg/L	summer	1.5	--
Bis(2-ethylhexyl)phthalate	µg/L	annual	21	2100
Mercury	ng/L	annual	12	1700

Table 10. Final Effluent Limits for Outfall 001

Parameter	Units	Concentration 30 Day Average	Concentration Daily Maximum	Loading (kg/day)[a] 30 Day Average	Loading (kg/day)[a] Daily Maximum	Basis[b]
Water Temperature	°C	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Flow Rate	MGD	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Dissolved Oxygen	mg/L	5.0 minimum		--	--	PD
pH	SU	6.5 - 9.0		--	--	EP/WQS
Total Suspended Solids	mg/L	18	27[d]	763	1146[d]	PD
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	12	18[d]	509	763[d]	EPD
Oil & Grease	mg/L	--	10	--	--	WQS
Total Filterable Residue	mg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				EP/M[c]
Ammonia						
Winter	mg/L	2.5	3.8[d]	106	159[d]	EP/PD
Summer	mg/L	1.5	2.3[d]	64	96[d]	EP/PD/WLA
Total Kjeldahl Nitrogen	mg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				EP/M[c]
Nitrate + Nitrite	mg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				EP/M[c]
Phosphorus	mg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				EP/M[c]
Orthophosphate	mg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				SB1
Cyanide, Free	mg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				EP
Barium	µg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				EP
Nickel	µg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				EP
Silver	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	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				RP
Hexavalent Chromium (Dissolved)	µg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				EP
Indeno(1,2,3,-cd)pyrene	µg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				RP
Mercury	ng/L	12	1700	0.0005	0.072	EP/WLA
Bis(2-ethylhexyl)phthalate	µg/L	21	2100	--	--	WLA
Chlorine, Total Residual	mg/L	--	0.037	--	--	EP
E. coli	#/100 mL	126	284[d]	--	--	WQS
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

[a] Effluent loadings based on average design discharge flow of 11.2 MGD.

[b] Definitions:

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 NPDES permits (3745-33-07(A))
SB1 = Ohio Senate Bill 1, signed on April 2, 2015
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.