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.: IPD00020*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 (WHH), 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:

<table>
<thead>
<tr>
<th>Aquatic life (EWH)</th>
<th>Average</th>
<th>Annual 7Q10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxics (metals, organics, etc.)</td>
<td>Maximum</td>
<td>Annual 1Q10</td>
</tr>
<tr>
<td>Ammonia</td>
<td>Average</td>
<td>Summer 30Q10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Winter 30Q10</td>
</tr>
<tr>
<td>AWS</td>
<td>Harmonic mean flow</td>
<td></td>
</tr>
<tr>
<td>Human Health (nondrinking)</td>
<td>Harmonic mean flow</td>
<td></td>
</tr>
</tbody>
</table>

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):

\[
TU_c = 100/\text{geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration}
\]

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 \([\text{PEQ}_{avg} ÷ \text{PEL}_{avg} \times 100, \text{ or } \text{PEQ}_{max} ÷ \text{PEL}_{max} \times 100]\), 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.

**Other Requirements**

**Compliance Schedule**

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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)

Direction of Flow

92.4 USGS Gage

Taylorsville Dam

87.4

Stillwater 81.0

Mad

80.2

Wolf Creek

Dayton WWTP 76.1

73.5

Holes Creek

MCD Western Regional 71.4

69.5

Owl

68.8

West Carrollton

67.6

Bear

65

USDOE Mound

Mound Overflow

65.0

Miamisburg WWTP

DP&L Hutchings

Franklin 59.6

58.

Clear Creek

Twin 57.

Middletown Canal

52.

Wausau Paper

51.

Wausau Papers

51.

AK Steel

49.

Middletown WWTP

Bold indicates major discharger

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

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<thead>
<tr>
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<td>mg/L</td>
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<td>12</td>
<td>NA</td>
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<td>µg/L</td>
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<td>ND (2)</td>
<td>ND (5)</td>
<td>ND (5)</td>
<td>ND (5)</td>
<td>ND (5)</td>
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<td>Copper</td>
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<td>Nickel</td>
<td>µg/L</td>
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<td>ND (5)</td>
<td>ND (5)</td>
<td>ND (5)</td>
<td>ND (5)</td>
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<td>Strontium</td>
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<td>NA</td>
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<td>Zinc</td>
<td>µg/L</td>
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<td>37</td>
<td>29.3</td>
<td>19.3</td>
<td>22.9</td>
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<td>Nitrate+Nitrite</td>
<td>mg/L</td>
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<td>NA</td>
<td>NA</td>
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<td>Bis(2-ethylhexyl)phthalate</td>
<td>µg/L</td>
<td>18.6</td>
<td>ND (5.3)</td>
<td>17.1</td>
<td>46.7</td>
<td>15.4</td>
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<td>Phenol</td>
<td>µg/L</td>
<td>3.7</td>
<td>ND (2.1)</td>
<td>ND (10)</td>
<td>ND (10)</td>
<td>ND (10)</td>
<td>ND (10)</td>
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<td>Toluene</td>
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<td>ND (0.5)</td>
<td>ND (5)</td>
<td>ND (5)</td>
<td>ND (5)</td>
<td>ND (2)</td>
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<td>Indeno(1,2,3-cd)pyrene</td>
<td>µg/L</td>
<td>ND (2.1)</td>
<td>ND (2.1)</td>
<td>ND (0.22)</td>
<td>ND (0.22)</td>
<td>3.82</td>
<td>ND (0.22)</td>
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<td>2,4, -dimethyl-1-heptene</td>
<td>µg/L</td>
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<td>NA</td>
<td>32.8</td>
<td>NA</td>
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<td>NA</td>
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<tr>
<td>2-Cyclohexen-1-one</td>
<td>µg/L</td>
<td>NA</td>
<td>NA</td>
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<td>NA</td>
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<td>9-Octadecenoic acid, (E)-(01)</td>
<td>µg/L</td>
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<td>9-Octadecenoic acid, (E)-(04)</td>
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<td>NA</td>
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<td>Cholestanol</td>
<td>µg/L</td>
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<td>NA</td>
<td>94.8</td>
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<td>NA</td>
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<td>Cholesterol</td>
<td>µg/L</td>
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<td>Cyclohexanol</td>
<td>µg/L</td>
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<td>µg/L</td>
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<td>Dodecanoic acid</td>
<td>µg/L</td>
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<td>84</td>
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<td>Hexadecanoic acid</td>
<td>µg/L</td>
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<td>Octadecanoic acid</td>
<td>µg/L</td>
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<td>Squalene</td>
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<td>Tetradecanoic acid</td>
<td>µg/L</td>
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<td>NA</td>
<td>79.6</td>
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<td>NA</td>
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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.

Fact Sheet for NPDES Permit Renewal, Tri-Cities North Regional Wastewater Authority, 2014

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### Table 2. Effluent Characterization Using Self-Monitoring Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Season</th>
<th>Units</th>
<th>Current Permit Limits</th>
<th># Obs.</th>
<th>Percentiles</th>
<th>Data Range</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>50th</td>
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<tr>
<td>Outfall 001</td>
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<tr>
<td>Water Temperature</td>
<td>Annual</td>
<td>°C</td>
<td>MONITOR</td>
<td>1996</td>
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<td>23.6</td>
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<td>Dissolved Oxygen</td>
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<td>mg/L</td>
<td>5.0 Minimum</td>
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<td>Dissolved Oxygen</td>
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<td>Total Filterable Residue (Dissolved Solids)</td>
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<td>mg/L</td>
<td>MONITOR</td>
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<td>755</td>
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<td></td>
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<td>kg/day</td>
<td></td>
<td></td>
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<td>1146a</td>
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<td>Oil and Grease</td>
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<td></td>
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<td>kg/day</td>
<td>64</td>
<td></td>
<td>96a</td>
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<td></td>
<td>Winter</td>
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<td>2.5</td>
<td>660</td>
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<td></td>
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<td>kg/day</td>
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<td>159a</td>
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<td>mg/L</td>
<td>MONITOR</td>
<td>69</td>
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<td>Nitrite + Nitrate</td>
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*Fact Sheet for NPDES Permit Renewal, Tri-Cities North Regional Wastewater Authority, 2014*
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<thead>
<tr>
<th>Parameter</th>
<th>Season</th>
<th>Units</th>
<th>Current Permit Limits</th>
<th># Obs.</th>
<th>Percentiles</th>
<th>Data Range</th>
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<td><strong>Parameter</strong></td>
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<td><strong>Units</strong></td>
<td><strong>30 day</strong></td>
<td><strong>Daily</strong></td>
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<td>Bis(2-ethylhexyl)phthalate</td>
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<td>µg/L</td>
<td>MONITOR</td>
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<td>mg/L</td>
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<td></td>
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<td>TUa</td>
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<td>TUc</td>
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<td>TUa</td>
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<td>TUc</td>
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<td>18 (^a)</td>
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<td></td>
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<td>12</td>
<td>18 (^a)</td>
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<td></td>
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<td>kg/day</td>
<td>Annual</td>
<td>509</td>
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<td>Ammonia</td>
<td>Annual</td>
<td>mg/kg</td>
<td>MONITOR</td>
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<td>56600</td>
<td>106000</td>
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<td>mg/kg</td>
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Fact Sheet for NPDES Permit Renewal, Tri-Cities North Regional Wastewater Authority, 2014

-20-
### Current Permit Limits

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Season</th>
<th>Units</th>
<th>30 day Limits</th>
<th>Daily Limits</th>
<th># Obs.</th>
<th>50th</th>
<th>95th</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Arsenic</td>
<td>Annual</td>
<td>mg/kg</td>
<td>75 Maximum</td>
<td></td>
<td>44</td>
<td>8.05</td>
<td>23.8</td>
<td>0-28.1</td>
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<tr>
<td>Cadmium</td>
<td>Annual</td>
<td>mg/kg</td>
<td>85 Maximum</td>
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<td>26</td>
<td>3.16</td>
<td>5.25</td>
<td>0-6.19</td>
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<td>Annual</td>
<td>mg/kg</td>
<td>4300 Maximum</td>
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<td>23</td>
<td>800</td>
<td>951</td>
<td>0-1010</td>
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<td>Lead</td>
<td>Annual</td>
<td>mg/kg</td>
<td>840 Maximum</td>
<td></td>
<td>22</td>
<td>43.4</td>
<td>59.1</td>
<td>1.12-67.4</td>
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<tr>
<td>Nickel</td>
<td>Annual</td>
<td>mg/kg</td>
<td>420 Maximum</td>
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<td>22</td>
<td>24.5</td>
<td>29.8</td>
<td>0-33.6</td>
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<td>Annual</td>
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<td>1390</td>
<td>0-1530</td>
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<td>Annual</td>
<td>mg/kg</td>
<td>100 Maximum</td>
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<td>0-7.97</td>
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<td>Sludge Fee Weight</td>
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<td>Dry Tons</td>
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<td>206</td>
<td>370</td>
<td>13.6-457</td>
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<tr>
<td>Sludge Weight</td>
<td>Annual</td>
<td>Dry Tons</td>
<td>MONITOR</td>
<td></td>
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<td>12.2</td>
<td>278</td>
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<tr>
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<td>Annual</td>
<td>mg/kg</td>
<td>57 Maximum</td>
<td></td>
<td>22</td>
<td>1.29</td>
<td>19.7</td>
<td>0-26.3</td>
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<td>Annual</td>
<td>mg/kg</td>
<td>75 Maximum</td>
<td></td>
<td>21</td>
<td>17.7</td>
<td>23.4</td>
<td>0-23.4</td>
</tr>
</tbody>
</table>

#### 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 |

*Fact Sheet for NPDES Permit Renewal, Tri-Cities North Regional Wastewater Authority, 2014*
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Season</th>
<th>Units</th>
<th>Current Permit Limits</th>
<th># Observations</th>
<th>Percentiles</th>
<th>Data Range</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>30 day</td>
<td>Daily</td>
<td>50th</td>
<td>95th</td>
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<td>Annual</td>
<td>S.U.</td>
<td>MONITOR</td>
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<tr>
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<td>S.U.</td>
<td>MONITOR</td>
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<td>7.7</td>
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<td>mg/L</td>
<td>MONITOR</td>
<td>724</td>
<td>154</td>
<td>194</td>
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<tr>
<td></td>
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<td>mg/L</td>
<td>MONITOR</td>
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<td>124</td>
<td>195</td>
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<td></td>
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<tr>
<td>Water Temperature</td>
<td>Annual</td>
<td>°C</td>
<td>MONITOR</td>
<td>69</td>
<td>16.2</td>
<td>25.3</td>
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<tr>
<td>Dissolved Oxygen</td>
<td>Summer</td>
<td>mg/L</td>
<td>MONITOR</td>
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<td>7.95</td>
<td>9.56</td>
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<td>mg/L</td>
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<tr>
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<td>S.U.</td>
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<td>154</td>
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<td>% Affected</td>
<td>MONITOR</td>
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<td>% Affected</td>
<td>MONITOR</td>
<td>4</td>
<td>8.5</td>
<td>14.6</td>
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<td>% Affected</td>
<td>MONITOR</td>
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<td>0</td>
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<tr>
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<td>% Affected</td>
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<td>°C</td>
<td>MONITOR</td>
<td>69</td>
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<td>25.1</td>
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<td>Summer</td>
<td>mg/L</td>
<td>MONITOR</td>
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<td>8.05</td>
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<tr>
<td>Dissolved Oxygen</td>
<td>Winter</td>
<td>mg/L</td>
<td>MONITOR</td>
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<td>12.1</td>
<td>14.8</td>
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*Fact Sheet for NPDES Permit Renewal, Tri-Cities North Regional Wastewater Authority, 2014*
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Season</th>
<th>Units</th>
<th>Current Permit Limits</th>
<th># Obs.</th>
<th>Percentiles</th>
<th>Data Range</th>
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<tr>
<td>pH</td>
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<td>S.U.</td>
<td>MONITOR</td>
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<td>mg/L</td>
<td>MONITOR</td>
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<td>µg/L</td>
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<td>Cadmium</td>
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<td>µg/L</td>
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<td>0</td>
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<td>Lead</td>
<td>Annual</td>
<td>µg/L</td>
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<td>0</td>
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<td>Chromium</td>
<td>Annual</td>
<td>µg/L</td>
<td>MONITOR</td>
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<td>Copper</td>
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<td>Hexavalent Chromium (Dissolved)</td>
<td>Annual</td>
<td>µg/L</td>
<td>MONITOR</td>
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<td>0</td>
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<tr>
<td>Fecal Coliform</td>
<td>Annual</td>
<td>#/100 mL</td>
<td>MONITOR</td>
<td>35</td>
<td>108</td>
<td>1000</td>
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</tbody>
</table>

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

<table>
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<tr>
<th>Parameter</th>
<th>Units</th>
<th>Number of Samples</th>
<th>Number &gt; MDL</th>
<th>PEQ Average</th>
<th>PEQ Maximum</th>
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<td>Total Filterable Residue (dissolved solids)(^A)</td>
<td>mg/L</td>
<td>52</td>
<td>52</td>
<td>797</td>
<td>840</td>
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<tr>
<td>Ammonia (Summer)</td>
<td>mg/L</td>
<td>530</td>
<td>528</td>
<td>2.33</td>
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<tr>
<td>Ammonia (Winter)</td>
<td>mg/L</td>
<td>335</td>
<td>335</td>
<td>1.13</td>
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<td>Nitrate + Nitrite(^A)</td>
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<td>140</td>
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<td>294</td>
<td>3.22</td>
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<td>Cyanide, free</td>
<td>µg/L</td>
<td>68</td>
<td>2</td>
<td>12.4</td>
<td>17.0</td>
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<tr>
<td>Barium(^A)</td>
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<td>52</td>
<td>93.4</td>
<td>108</td>
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<tr>
<td>Nickel(^A)</td>
<td>µg/L</td>
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<td>2</td>
<td>3.29</td>
<td>4.50</td>
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<td>Silver</td>
<td>µg/L</td>
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<td>14</td>
<td>0.597</td>
<td>0.874</td>
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<tr>
<td>Zinc(^A)</td>
<td>µg/L</td>
<td>75</td>
<td>74</td>
<td>31.5</td>
<td>38.8</td>
</tr>
<tr>
<td>Cadmium</td>
<td>µg/L</td>
<td>69</td>
<td>0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Lead</td>
<td>µg/L</td>
<td>69</td>
<td>0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Chromium</td>
<td>µg/L</td>
<td>69</td>
<td>0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Copper(^A)</td>
<td>µg/L</td>
<td>75</td>
<td>75</td>
<td>24.4</td>
<td>29.1</td>
</tr>
<tr>
<td>Hexavalent Chromium (Dissolved)</td>
<td>µg/L</td>
<td>69</td>
<td>0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Bis(2-ethylhexyl)phthalate(^A,C)</td>
<td>µg/L</td>
<td>56</td>
<td>23</td>
<td>34.1</td>
<td>46.7</td>
</tr>
<tr>
<td>Chlorine, Total Residual</td>
<td>µg/L</td>
<td>740</td>
<td>17</td>
<td>12.3</td>
<td>16.8</td>
</tr>
<tr>
<td>Mercury</td>
<td>ng/L</td>
<td>70</td>
<td>67</td>
<td>11.5</td>
<td>17.5</td>
</tr>
<tr>
<td><strong>Combined Other Data(^B)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arsenic</td>
<td>µg/L</td>
<td>6</td>
<td>1</td>
<td>6.66</td>
<td>9.12</td>
</tr>
<tr>
<td>Iron</td>
<td>µg/L</td>
<td>2</td>
<td>2</td>
<td>949</td>
<td>1300</td>
</tr>
<tr>
<td>Magnesium</td>
<td>mg/L</td>
<td>2</td>
<td>2</td>
<td>91.5</td>
<td>125</td>
</tr>
<tr>
<td>Manganese</td>
<td>µg/L</td>
<td>2</td>
<td>2</td>
<td>147</td>
<td>201</td>
</tr>
<tr>
<td>Strontium</td>
<td>µg/L</td>
<td>2</td>
<td>2</td>
<td>2136</td>
<td>2926</td>
</tr>
<tr>
<td>Chloride</td>
<td>mg/L</td>
<td>2</td>
<td>2</td>
<td>627</td>
<td>859</td>
</tr>
<tr>
<td>Phenol</td>
<td>µg/L</td>
<td>6</td>
<td>1</td>
<td>10.3</td>
<td>14.1</td>
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<tr>
<td>Toluene</td>
<td>µg/L</td>
<td>6</td>
<td>1</td>
<td>1.78</td>
<td>2.43</td>
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<tr>
<td>Indeno(1,2,3,-cd)pyrene</td>
<td>µg/L</td>
<td>6</td>
<td>1</td>
<td>5.86</td>
<td>8.02</td>
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<tr>
<td>2,4-dimethyl-1-heptene</td>
<td>µg/L</td>
<td>1</td>
<td>1</td>
<td>148</td>
<td>203</td>
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<tr>
<td>2-Cyclohexen-1-one</td>
<td>µg/L</td>
<td>1</td>
<td>1</td>
<td>548</td>
<td>750</td>
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<tr>
<td>9-Octadecenoic acid, (E)-(01)</td>
<td>µg/L</td>
<td>1</td>
<td>1</td>
<td>462</td>
<td>632</td>
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<tr>
<td>9-Octadecenoic acid, (E)-(04)</td>
<td>µg/L</td>
<td>1</td>
<td>1</td>
<td>1032</td>
<td>1414</td>
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<tr>
<td>Cholestanol</td>
<td>µg/L</td>
<td>1</td>
<td>1</td>
<td>429</td>
<td>588</td>
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<tr>
<td>Cholesterol</td>
<td>µg/L</td>
<td>1</td>
<td>1</td>
<td>411</td>
<td>562</td>
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<tr>
<td>Cyclohexanol</td>
<td>µg/L</td>
<td>1</td>
<td>1</td>
<td>181</td>
<td>248</td>
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Fact Sheet for NPDES Permit Renewal, Tri-Cities North Regional Wastewater Authority, 2014 -24-
<table>
<thead>
<tr>
<th>Substance</th>
<th>Unit</th>
<th>Sample 1</th>
<th>Sample 2</th>
<th>MDL</th>
<th>PEQ</th>
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<tbody>
<tr>
<td>Cyclohexene</td>
<td>µg/L</td>
<td>1</td>
<td>1</td>
<td>3204</td>
<td>4390</td>
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<tr>
<td>Dodecanoic acid</td>
<td>µg/L</td>
<td>1</td>
<td>1</td>
<td>380</td>
<td>521</td>
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<tr>
<td>Hexadecanoic acid</td>
<td>µg/L</td>
<td>2</td>
<td>2</td>
<td>1326</td>
<td>1816</td>
</tr>
<tr>
<td>Octadecanoic acid</td>
<td>µg/L</td>
<td>2</td>
<td>2</td>
<td>533</td>
<td>730</td>
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<tr>
<td>Squalene</td>
<td>µg/L</td>
<td>1</td>
<td>1</td>
<td>363</td>
<td>497</td>
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<tr>
<td>Tetradecanoic acid</td>
<td>µg/L</td>
<td>1</td>
<td>1</td>
<td>360</td>
<td>494</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Collection Date</th>
<th>UP</th>
<th>C</th>
<th>%M</th>
<th>TUa</th>
<th>UP</th>
<th>C</th>
<th>%M</th>
<th>TUa</th>
<th>UP</th>
<th>C</th>
<th>%M</th>
<th>TUa</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/12/2011</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
</tr>
<tr>
<td>12/13/2011</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
</tr>
<tr>
<td>12/13/11-12/14/11a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
</tr>
<tr>
<td>4/30/2012</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
</tr>
<tr>
<td>5/1/2012</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
</tr>
<tr>
<td>4/30/12-5/1/12a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ND</td>
</tr>
</tbody>
</table>

*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

<table>
<thead>
<tr>
<th>Date</th>
<th>Ceriodaphnia dubia</th>
<th>Pimephales promelas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acute Toxicity (TUa)</td>
<td>Chronic Toxicity (TUc)</td>
</tr>
<tr>
<td>6/18/2010</td>
<td>AA</td>
<td>AA</td>
</tr>
<tr>
<td>6/20/2011</td>
<td>AA</td>
<td>AA</td>
</tr>
<tr>
<td>6/19/2012</td>
<td>AA</td>
<td>AA</td>
</tr>
<tr>
<td>6/1/2013</td>
<td>AA</td>
<td>AA</td>
</tr>
</tbody>
</table>

AA = not detected (limit 0.2)
TUa = acute toxicity unit
TUc = chronic toxicity unit
Table 5. Summary of the Great Miami River Mainstem Use Designation Status and Causes/Sources of Impairment, 2009-10 Surveys

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Outside Mixing Zone Criteria</th>
<th>Inside Mixing Zone Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Antimony</td>
<td>µg/L</td>
<td>4300</td>
<td>--</td>
</tr>
<tr>
<td>Arsenic</td>
<td>µg/L</td>
<td>--</td>
<td>100</td>
</tr>
<tr>
<td>Barium</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Benzene C</td>
<td>µg/L</td>
<td>710</td>
<td>--</td>
</tr>
<tr>
<td>3,4-Benzofluoranthene D</td>
<td>µg/L</td>
<td>0.49</td>
<td>--</td>
</tr>
<tr>
<td>Benzo(a)pyrene C</td>
<td>µg/L</td>
<td>0.49</td>
<td>--</td>
</tr>
<tr>
<td>Beryllium A</td>
<td>µg/L</td>
<td>280</td>
<td>100</td>
</tr>
<tr>
<td>Bis(2-ethylhexyl)phthalate C</td>
<td>µg/L</td>
<td>59</td>
<td>--</td>
</tr>
<tr>
<td>Boron</td>
<td>µg/L</td>
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<td>--</td>
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<tr>
<td>Bromodichloromethane C</td>
<td>µg/L</td>
<td>460</td>
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<tr>
<td>Cadmium A</td>
<td>µg/L</td>
<td>--</td>
<td>50</td>
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<tr>
<td>Chlorine, Total Residual</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
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<tr>
<td>Chlorobenzene</td>
<td>µg/L</td>
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<tr>
<td>Chloroform C</td>
<td>µg/L</td>
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<tr>
<td>Hexavalent Chromium (dissolved)</td>
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</tr>
<tr>
<td>Chromium A</td>
<td>µg/L</td>
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<tr>
<td>Copper A</td>
<td>µg/L</td>
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<td>500</td>
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<td>Cyanide, free</td>
<td>µg/L</td>
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<tr>
<td>Dibromochloromethane C</td>
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<td>1,2-Dichloroethane C</td>
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<tr>
<td>1,1-Dichloroethylene C</td>
<td>µg/L</td>
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<tr>
<td>2,4-Dimethylphenol</td>
<td>µg/L</td>
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<tr>
<td>Ethylbenzene</td>
<td>µg/L</td>
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<tr>
<td>Fluoride</td>
<td>µg/L</td>
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<td>2000</td>
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<td>Heptachlor Epoxide C</td>
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<td>µg/L</td>
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<td>Ideno(1,2,3-c,d)pyrene C</td>
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<tr>
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<td>µg/L</td>
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<td>5000</td>
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<td>Lead A</td>
<td>µg/L</td>
<td>--</td>
<td>100</td>
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<tr>
<td>Mercury B</td>
<td>µg/L</td>
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<td>10000</td>
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<tr>
<td>Molybdenum</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Nickel A</td>
<td>µg/L</td>
<td>4600</td>
<td>200</td>
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<tr>
<td>Nitrate+Nitrite</td>
<td>mg/L</td>
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<td>100</td>
</tr>
<tr>
<td>Phenol</td>
<td>µg/L</td>
<td>4600000</td>
<td>--</td>
</tr>
<tr>
<td>Substance</td>
<td>Unit</td>
<td>Value 1</td>
<td>Value 2</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Selenium</td>
<td>µg/L</td>
<td>11000</td>
<td>50</td>
</tr>
<tr>
<td>SilverA</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Strontium</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Tetrachloroethylene &lt;sup&gt;C&lt;/sup&gt;</td>
<td>µg/L</td>
<td>89</td>
<td>--</td>
</tr>
<tr>
<td>Thallium</td>
<td>µg/L</td>
<td>6.3</td>
<td>--</td>
</tr>
<tr>
<td>Toluene</td>
<td>µg/L</td>
<td>200000</td>
<td>--</td>
</tr>
<tr>
<td>Total Filterable Residue (dissolved solids) &lt;sup&gt;A&lt;/sup&gt;</td>
<td>mg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Xylenes</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Zinc &lt;sup&gt;A&lt;/sup&gt;</td>
<td>µg/L</td>
<td>69000</td>
<td>25000</td>
</tr>
</tbody>
</table>

<sup>A</sup> Aquatic Life Criteria is hardness-based.
<sup>B</sup> Bioaccumulative Chemical of Concern
<sup>C</sup> Carcinogen
<sup>D</sup> Use Criteria for Benzo(b)fluoranthene
Table 7. Instream Conditions and Discharger Flow

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Value</th>
<th>Basis</th>
</tr>
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<tbody>
<tr>
<td><strong>Upstream Flows</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>GMR at Taylorsville</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7Q10</td>
<td>cfs</td>
<td>58.4</td>
<td>USGS gage #03263000, 1970-2012 data</td>
</tr>
<tr>
<td>1Q10</td>
<td>cfs</td>
<td>42</td>
<td>USGS gage #03263000, 1970-2012 data</td>
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<tr>
<td>30Q10</td>
<td>cfs</td>
<td>73</td>
<td>USGS gage #03263000, 1970-2012 data</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Harmonic Mean Flow</strong></td>
<td>cfs</td>
<td>299.9</td>
<td>USGS gage #03263000, 1970-2012 data</td>
</tr>
<tr>
<td><strong>Mixing Assumption</strong></td>
<td>%</td>
<td>100</td>
<td>Stream-to-discharge ratio</td>
</tr>
<tr>
<td>(GMR &amp; Tribs.)</td>
<td>%</td>
<td>100</td>
<td>Stream-to-discharge ratio</td>
</tr>
<tr>
<td><strong>Stillwater River at Mouth</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7Q10</td>
<td>cfs</td>
<td>24.2</td>
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</tr>
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<td>1Q10</td>
<td>cfs</td>
<td>20.4</td>
<td>USGS gage #03266000, 1970-2012 data</td>
</tr>
<tr>
<td>30Q10</td>
<td>cfs</td>
<td>29.8</td>
<td>USGS gage #03266000, 1970-2012 data</td>
</tr>
<tr>
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<td>Value</td>
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**Holes Creek at Mouth**

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**Indian Creek at Mouth**

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**Clear Creek at Mouth**

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**Elk Creek at Mouth**

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**Bear Creek at Mouth**

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**Gregory Creek at Mouth**

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Fact Sheet for NPDES Permit Renewal, Tri-Cities North Regional Wastewater Authority, 2014 -32-
### Background Water Quality for the Great Miami River

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<th>µg/L</th>
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<td>Benzo(a)pyrene</td>
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### Outfall 001 Flow Rate

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<th>cfs (MGD)</th>
<th>avg.</th>
<th>17.33 (11.2)</th>
<th>NPDES permit application</th>
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### Table of Stream Flows

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### Tri-Cities North R WWTP

- **Outfall 001 flow rate**: cfs (MGD) | avg. | 17.33 (11.2) | NPDES permit application
- **Tri-Cities North R WWTP**
  - **Outfall 001 flow rate**: cfs (MGD) | avg. | 17.33 (11.2) | NPDES permit application

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*Fact Sheet for NPDES Permit Renewal, Tri-Cities North Regional Wastewater Authority, 2014*
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<td>µg/L</td>
<td>annual</td>
<td>2.95</td>
<td>STORET; 18 values, 0 &lt;MDL, 2009-10</td>
</tr>
<tr>
<td>Nitrate+Nitrite</td>
<td>mg/L</td>
<td>annual</td>
<td>1.26</td>
<td>STORET; 26 values, 2 &lt;MDL, 2009-10</td>
</tr>
<tr>
<td>Phenols</td>
<td>µg/L</td>
<td>annual</td>
<td>0</td>
<td>STORET; 3 values, 3 &lt;MDL, 2009</td>
</tr>
<tr>
<td>Selenium</td>
<td>µg/L</td>
<td>annual</td>
<td>0</td>
<td>STORET; 18 values, 18 &lt;MDL, 2009-10</td>
</tr>
<tr>
<td>Silver</td>
<td>µg/L</td>
<td>annual</td>
<td>0</td>
<td>No representative data available.</td>
</tr>
<tr>
<td>Total Filterable Residue (dissolved solids)</td>
<td>mg/L</td>
<td>annual</td>
<td>412</td>
<td>STORET; 26 values, 0 &lt;MDL, 2009-10</td>
</tr>
<tr>
<td>Tetrachloroethylene</td>
<td>µg/L</td>
<td>annual</td>
<td>0</td>
<td>STORET; 3 values, 3 &lt;MDL, 2009</td>
</tr>
<tr>
<td>Thallium</td>
<td>µg/L</td>
<td>annual</td>
<td>0</td>
<td>No representative data available.</td>
</tr>
<tr>
<td>Toluene</td>
<td>µg/L</td>
<td>annual</td>
<td>0</td>
<td>STORET; 3 values, 3 &lt;MDL, 2009</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>µg/L</td>
<td>annual</td>
<td>0</td>
<td>STORET; 3 values, 3 &lt;MDL, 2009</td>
</tr>
<tr>
<td>Xylenes</td>
<td>µg/L</td>
<td>annual</td>
<td>0</td>
<td>STORET; 3 values, 3 &lt;MDL, 2009</td>
</tr>
<tr>
<td>Zinc</td>
<td>µg/L</td>
<td>annual</td>
<td>5</td>
<td>STORET; 18 values, 13 &lt;MDL, 2009-10</td>
</tr>
</tbody>
</table>

DMR = Discharge Monitoring Report

Fact Sheet for NPDES Permit Renewal, Tri-Cities North Regional Wastewater Authority, 2014
-34-
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Outside Mixing Zone Criteria</th>
<th>Inside Mixing Zone Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td>Maximum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Human Health</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Antimony&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>78740&lt;sup&gt;A&lt;/sup&gt;</td>
<td>--</td>
</tr>
<tr>
<td>Arsenic&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>--</td>
<td>399</td>
</tr>
<tr>
<td>Barium</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Beryllium&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>5127&lt;sup&gt;A&lt;/sup&gt;</td>
<td>1813&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Bis(2-ethylhexyl)phthalate</td>
<td>µg/L</td>
<td>322</td>
<td>--</td>
</tr>
<tr>
<td>Cadmium&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>--</td>
<td>198&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Chlorine, Total Residual</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Chromium, total&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>--</td>
<td>397</td>
</tr>
<tr>
<td>Hexavalent Chromium (dissolved)&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Copper</td>
<td>µg/L</td>
<td>3941&lt;sup&gt;A&lt;/sup&gt;</td>
<td>1514&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cyanide, free</td>
<td>µg/L</td>
<td>1435000A</td>
<td>--</td>
</tr>
<tr>
<td>Ideno(1,2,3-c,d)pyrene</td>
<td>µg/L</td>
<td>9.0</td>
<td>--</td>
</tr>
<tr>
<td>Lead&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>--</td>
<td>377</td>
</tr>
<tr>
<td>Mercury&lt;sup&gt;C&lt;/sup&gt;</td>
<td>ng/L</td>
<td>12</td>
<td>10000&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Molybdenum&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Nickel&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>18190&lt;sup&gt;A&lt;/sup&gt;</td>
<td>781</td>
</tr>
<tr>
<td>Phenol&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>84200000&lt;sup&gt;A&lt;/sup&gt;</td>
<td>--</td>
</tr>
<tr>
<td>Selenium&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>46960</td>
<td>213</td>
</tr>
<tr>
<td>Silver</td>
<td>µg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Total Filterable Residue (dissolved solids)</td>
<td>mg/L</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Thallium&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>115</td>
<td>--</td>
</tr>
<tr>
<td>Zinc&lt;sup&gt;B&lt;/sup&gt;</td>
<td>µg/L</td>
<td>25750&lt;sup&gt;A&lt;/sup&gt;</td>
<td>93340&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Period</th>
<th>Average</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloride</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholestanol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclohexanol</td>
<td>2-Cyclohexen-1-one</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclohexene</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dodecanoic acid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hexadecanoic acid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td>Manganese</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Octadecanoic acid, (E)-(01)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Octadecanoic acid, (E)-(04)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squalene</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetradecanoic acid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Period</th>
<th>Average</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimony</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arsenic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beryllium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cadmium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hexavalent Chromium (dissolved)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chromium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>Lead</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel</td>
<td>Nitrate+Nitrite</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selenium</td>
<td>Strontium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>Zinc</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Period</th>
<th>Average</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia (winter)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyanide, Free</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Filterable Residue (dissolved solids)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Period</th>
<th>Average</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine, Total Residual</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indeno(1,2,3,-cd)pyrene</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Period</th>
<th>Average</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia</td>
<td>mg/L</td>
<td>summer</td>
<td>1.5</td>
<td>--</td>
</tr>
<tr>
<td>Bis(2-ethylhexyl)phthalate</td>
<td>µg/L</td>
<td>annual</td>
<td>21</td>
<td>2100</td>
</tr>
<tr>
<td>Mercury</td>
<td>ng/L</td>
<td>annual</td>
<td>12</td>
<td>1700</td>
</tr>
</tbody>
</table>
### Table 10. Final Effluent Limits for Outfall 001

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Concentration</th>
<th>Loading (kg/day)a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>30 Day Average</td>
<td>Daily Maximum</td>
</tr>
<tr>
<td>Water Temperature</td>
<td>°C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Flow Rate</td>
<td>MGD</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dissolved Oxygen</td>
<td>mg/L</td>
<td>5.0 minimum</td>
<td>-</td>
</tr>
<tr>
<td>pH</td>
<td>SU</td>
<td>6.5 - 9.0</td>
<td>-</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>mg/L</td>
<td>18</td>
<td>27d</td>
</tr>
<tr>
<td>Carbonaceous Biochemical Oxygen Demand (5 day)</td>
<td>mg/L</td>
<td>12</td>
<td>18d</td>
</tr>
<tr>
<td>Oil &amp; Grease</td>
<td>mg/L</td>
<td>--</td>
<td>10</td>
</tr>
<tr>
<td>Total Filterable Residue</td>
<td>mg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ammonia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter</td>
<td>mg/L</td>
<td>2.5</td>
<td>3.8d</td>
</tr>
<tr>
<td>Summer</td>
<td>mg/L</td>
<td>1.5</td>
<td>2.3d</td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen</td>
<td>mg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nitrate + Nitrite</td>
<td>mg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>mg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Orthophosphate</td>
<td>mg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cyanide, Free</td>
<td>mg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Barium</td>
<td>µg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nickel</td>
<td>µg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Silver</td>
<td>µg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Zinc</td>
<td>µg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cadmium</td>
<td>µg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Lead</td>
<td>µg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chromium</td>
<td>µg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Copper</td>
<td>µg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hexavalent Chromium (Dissolved)</td>
<td>µg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>µg/L</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mercury</td>
<td>ng/L</td>
<td>12</td>
<td>1700</td>
</tr>
<tr>
<td>Bis(2-ethylhexyl)phthalate</td>
<td>µg/L</td>
<td>21</td>
<td>2100</td>
</tr>
<tr>
<td>Chlorine, Total Residual</td>
<td>mg/L</td>
<td>--</td>
<td>0.037</td>
</tr>
<tr>
<td>E. coli</td>
<td>#/100 mL</td>
<td>126</td>
<td>284d</td>
</tr>
<tr>
<td>Acute Toxicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceriodaphnia dubia</td>
<td>TUₐ</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Pinephales promelas</td>
<td>TUₐ</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chronic Toxicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceriodaphnia dubia</td>
<td>TUₐ</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Fact Sheet for NPDES Permit Renewal, Tri-Cities North Regional Wastewater Authority, 2014
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.