

National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for the Upper Mill Creek Water Reclamation Facility

Public Notice No.: 12-12-042
Public Notice Date: December 25, 2012
Comment Period Ends: January 25, 2013

OEPA Permit No.: 1PK00016 *MD
Application No.: OH0072087

Name and Address of Applicant:

Butler County Water and Sewer Department
130 High Street
Hamilton, Ohio 45011

Name and Address of Facility Where
Discharge Occurs:

Upper Mill Creek Water Reclamation Facility
6055 Centre Park Drive
West Chester, Ohio

Receiving Water: East Fork Mill Creek

Subsequent
Stream Network: Mill Creek, Ohio River

Introduction

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations, 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, 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 and Ohio Water Pollution Control Law (ORC 6111). Decisions to award variances to Water Quality Standards or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the Clean Water Act. Many of these have already been established by 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 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 wasteload allocation for a pollutant to a measure of the effluent quality. The measure of effluent quality is called PEQ - Projected Effluent Quality.

This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

Summary of Permit Conditions

The effluent limits and monitoring requirements proposed for the following parameters are the same as in the current permit, although some monitoring frequencies have changed: flow, temperature, dissolved oxygen, CBOD₅, total suspended solids, ammonia-nitrogen, total phosphorus, nitrite+nitrate-nitrogen, oil and grease, pH, *Escherichia coli*, free cyanide, cadmium, chromium, dissolved hexavalent chromium, copper, lead, mercury, nickel, zinc and bis(2-ethylhexyl)phthalate.

New water-quality-based limits are proposed for total filterable residue (total dissolved solids) because effluent data show that it has reasonable potential to cause or contribute to a violation of water quality standards.

Quarterly chronic toxicity testing with the determination of acute endpoints using *Ceriodaphnia dubia* is proposed for two years followed by annual testing. Annual testing using fathead minnows is proposed for the life of the permit. A trigger for conducting a toxicity reduction evaluation is also proposed.

A revised compliance schedule is proposed for implementing the *Mill Creek TMDL*.

In Part II of the permit, special conditions are included that address sanitary sewer overflow reporting; operator certification, minimum staffing and operator of record; whole effluent toxicity testing; outfall signage; and pretreatment program requirements.

Table of Contents

	Page
Introduction.....	1
Summary of Permit Conditions	2
Table of Contents	2
Procedures for Participation in the Formulation of Final Determinations	3
Location of Discharge/Receiving Water Use Classification	4
Facility Description.....	5
Description of Existing Discharge	5
Assessment of Impact on Receiving Waters	5

Table of Contents (Continued)

Development of Water Quality Based Effluent Limits	6
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Reasonable Potential / Effluent Limits / Hazard Management Decisions	8
Other Requirements	11

List of Figures

Figure 1. Location of Upper Mill Creek Wastewater Treatment Plant	12
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List of Tables

Table 1. Effluent Characterization Using Ohio EPA and Pretreatment Data	13
Table 2. Effluent Characterization Using Self-Monitoring Data	14
Table 3. Projected Effluent Quality Values.....	15
Table 4. Summary of Acute and Chronic Toxicity Test Results.....	16
Table 5. Water Quality Criteria in the Study Area.....	17
Table 6. Instream Conditions and Discharger Flow.....	18
Table 7. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria.....	19
Table 8. Parameter Assessment.....	20
Table 9. Final Effluent Limits and Monitoring Requirements.....	21

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 OEPA 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 Gary Stuhlfauth, (614) 644-2026, Gary.Stuhlfauth@epa.ohio.gov.

Location of Discharge/Receiving Water Use Classification

The Upper Mill Creek wastewater treatment plant discharges at river mile 1.07 to the East Fork Mill Creek, which flows into the Mill Creek. Figure 1 shows the approximate location of this facility.

This section of East Fork Mill Creek is designated by Ohio EPA River Code 23-006, USEPA River Reach number 05090203-014, County: Butler, Ecoregion: Eastern Corn Belt Plains. The East Fork Mill Creek is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-30): Warmwater Habitat, Agricultural Water Supply, Industrial Water Supply, and Class B Primary Contact Recreation.

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric water quality standards 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 Clean Water Act. Ohio WQS also include aquatic life use designations for waterbodies which can not meet the Clean Water Act goals because of human-caused conditions that can not be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact) 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 agricultural and industrial water supply.

Facility Description

The Upper Mill Creek plant has a design flow of 16.0 million gallons per day (MGD). Wet stream processes are influent pumping, screening and grit removal, secondary treatment using oxidation ditches, biological and chemical nutrient removal, final clarification, tertiary filtration, ultra violet disinfection, and post aeration. Normal solid stream processes are polymer addition, dewatering by centrifugation or by belt filter press (back up), and sludge disposal by transferring to another NPDES facility for incineration or disposal at a mixed solid waste landfill.

The Upper Mill Creek plant is served by a separate sanitary sewer system.

The County implements an Ohio EPA approved industrial pretreatment program. Based on information in the NPDES permit renewal application, 23 categorical industrial users and 6 significant non-categorical industrial users discharge approximately 1.1 MGD to the plant.

Description of Existing Discharge

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

Table 2 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 1PK00016001. Data are presented for the period January 2007 through May 2012, and current permit limits are provided for comparison.

Table 3 summarizes the chemical specific data for outfall 001 by presenting the average and maximum Projected Effluent Quality (PEQ) values.

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

The County reports sanitary sewer overflow (SSO) occurrences under Station 300 in its NPDES permit. The County reported 1 SSO in 2010, 2 in 2011 and 1 through September 2012.

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

Assessment of Impact on Receiving Waters

The *Ohio 2012 Integrated Water Quality Monitoring and Assessment Report* lists the East Fork Mill Creek – Mill Creek assessment unit as impaired for aquatic life. This assessment is based on data collected in 2002 and 2009. Direct habitat alterations, nutrients, organic enrichment (sewage) biological indicators and other flow regime alterations are listed as causes of the impairment. Channelization, combined sewer overflows and urban runoff/storm sewers are listed as the sources of the impairment.

The 2002 data was collected in support of a TMDL (total maximum daily loads) for the Mill Creek watershed that was approved by U.S. EPA in April 2005. The TMDL recommended total phosphorus and dissolved

nitrogen limits for the Upper Mill Creek plant. The current NPDES permit includes limits and a compliance schedule for meeting the TMDL recommendations by the end of January 2017.

The 2009 data was collected in support of a natural channel restoration project in the vicinity of the Mill Creek/East Fork Mill Creek confluence. It shows the East Fork in partial attainment of its Warmwater Habitat use designation at river miles 0.8 and 0.0.

The *Biological and Water Quality Study of Mill Creek and Tributaries 2011* (conducted by the Midwest Biodiversity Institute for the Metropolitan Sewer District of Greater Cincinnati) found widespread instream phosphorus concentrations below the target value though they were elevated in the East Fork at sites downstream of the Upper Mill Creek plant. The study showed biological attainment just downstream of the Upper Mill Creek outfall and partial attainment at sites farther downstream on the East Fork.

Ohio EPA will be returning to the Mill Creek watershed in 2014 to complete a full watershed assessment. The results of this assessment will be used to recalculate the TMDLs for the watershed. The 2005 TMDL focused on a limited number of stressors. The Agency has steadily increased the types of stressors that we address in TMDLs, so any new TMDL will be more comprehensive.

The complete *2012 Integrated Report* is available at the following Ohio EPA web site:
<http://epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.aspx> .

The *2005 TMDL* is available at: <http://epa.ohio.gov/dsw/tmdl/MillCreekOhio.aspx> .

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 Upper Mill Creek plant were used to determine what parameters should undergo wasteload allocation. The parameters discharged are identified by the data available to Ohio EPA - Discharge Monitoring Report (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 2007 through May 2012
Pretreatment data	2007 through 2011
Ohio EPA compliance sampling data	2008 through 2011

This data is evaluated statistically, and Projected Effluent Quality (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 water quality standards (WQS) and allowable wasteload allocation (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 wasteload allocation is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a wasteload allocation is conducted to determine whether the parameter exhibits reasonable

potential and needs to have a limit or if monitoring is required. See Table 8 for a summary of the screening results.

Wasteload Allocation For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio Water Quality Standards (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. Wasteload allocations using this method are done using the following general equation: Discharger WLA = (downstream flow x WQS) - (upstream flow x background concentration). Discharger WLAs are divided by the discharge flow so that the allocations are expressed as concentrations.

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

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

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

Ohio’s water quality standard 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 water quality standards at the end-of-pipe, which are 12 ng/l (average) and 1700 ng/l (maximum) in the Ohio River basin.

The data used in the WLA are listed in Tables 5 and 6. The wasteload allocation results to maintain all applicable criteria are presented in Table 7. The current ammonia limits have been evaluated using the wasteload allocation procedures and are protective of water quality standards for ammonia toxicity.

Whole Effluent Toxicity WLA Whole effluent toxicity (WET) is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

Water quality standards 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). Wasteload allocations can then be calculated using TUs as if they were water quality criteria.

The wasteload allocation 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 the Upper Mill Creek plant, the wasteload allocation values are 0.30 TU_a and 1.02 TU_c.

The chronic toxicity unit (TU_c) is defined as 100 divided by the IC₂₅:

$$TU_c = 100/IC_{25}$$

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):

$$TU_c = 100/\text{geometric mean of NOEC and LOEC}$$

The acute toxicity unit (TU_a) is defined as 100 divided by the LC₅₀ for the most sensitive test species:

$$TU_a = 100/LC_{50}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations.

When the acute wasteload allocation is less than 1.0 TU_a, it may be defined as:

<u>Dilution Ratio</u> <u>(downstream flow to discharger flow)</u>	<u>Wasteload Allocation</u> <u>(percent effects in 100% effluent)</u>
up to 2 to 1	30
greater than 2 to 1 but less than 2.7 to 1	40
2.7 to 1 to 3.3 to 1	50

The acute wasteload allocation for the Upper Mill Creek plant is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1.0 to 1.

Reasonable Potential/ Effluent Limits/Hazard Management Decisions

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the water quality standards must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a water quality standard or do not require a wasteload allocation 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 wasteload allocations are selected from Table 7. 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} ÷ PEL_{avg}) X 100, or (PEQ_{max} ÷ PEL_{max}) X 100], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 8.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 9 presents the final effluent limits and monitoring requirements proposed for Upper Mill Creek outfall 1PK00016001 and the basis for their recommendation.

The limits proposed for dissolved oxygen, CBOD₅ (5-day carbonaceous biochemical oxygen demand), total suspended solids and ammonia-nitrogen are based on BADCT (Best Available Demonstrated Control Technology as defined in Table 5-1 of Rule 3745-1-05). Modeling for ammonia toxicity confirmed that the BADCT limits for ammonia are adequate to maintain the ammonia water quality standards during the summer and winter. These are all a continuation of existing permit limits.

The limits proposed for pH, oil and grease, and *Escherichia coli* are based on Ohio Water Quality Standards (OAC 3745-1-07). Class B Primary Contact Recreation *E. coli* standards apply to the East Fork Mill Creek.

TMDL Implementation

The final effluent limits proposed for total phosphorus and total nitrite+nitrate-nitrogen are a continuation of existing permit limits that became effective in January 2006. They are the first phase of meeting the point source wasteload allocations that are identified in the *2005 Mill Creek TMDL*.

The 2005 TMDL also established a phased implementation approach that, in addition to the 2006 pollutant reductions, included an Ohio EPA watershed assessment, which is scheduled for 2014. If attainment of biological criteria is not achieved, the 2005 TMDL requires compliance with the wasteload allocations. The implementation schedule in the current permit requires compliance by January 31, 2017.

Ohio EPA will evaluate the results of its 2014 watershed assessment to determine if biological criteria are being met and to determine if observed impairments are nutrient-related. Where necessary, the Agency will use the results of the 2014 assessment to recalculate the TMDLs for the watershed (scheduled for 2017).

Consistent with the adaptive implementation measures called for in the 2005 TMDL, we are proposing to revise the TMDL implementation schedule to provide time for evaluating the new data and making revisions and adjustments to the implementation plan. This strategy is supported by the findings of the *Biological and Water Quality Study of Mill Creek and Tributaries 2011* (conducted by the Midwest Biodiversity Institute for the Metropolitan Sewer District of Greater Cincinnati). That study found widespread instream phosphorus concentrations below the target value and biological attainment just downstream of the Upper Mill Creek outfall.

Key parts of the proposed compliance schedule for implementing the *Mill Creek TMDL* include:

- Submitting periodic status reports on the capability of the existing treatment facilities to reduce the effluent loadings of total phosphorus and total nitrite+nitrate-N and a summary of other projects, initiatives or actions the County is taking to achieve the loading reductions necessary to meet the wasteload allocations.
- Providing time for Ohio EPA's 2014 watershed assessment and 2017 TMDL.
- A reopener that the permit may be modified or renewed to include new or revised effluent limits or other conditions necessary to comply with an approved TMDL.
- Submittal of a general plan by March 1, 2020 to achieve the wasteload allocations for total phosphorus and total nitrite+nitrate-N.
- Compliance with the wasteload allocations for total phosphorus and total nitrite+nitrate-N no later than March 1, 2024.

The Ohio EPA risk assessment (Table 8) places total filterable residue (total dissolved solids) in group 5. This placement as well as the data in Tables 1, 2 and 3 indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For this parameter, the PEQ is between 75 and 100 percent of the wasteload allocation and certain conditions exist that increase the risk to the environment. Pollutants that meet this requirement must have permit limits under OAC Rule 3745-33-07(A)(1). The thirty day average limit is based on the wasteload allocation (Table 7). Effluent data from August 2008 through August 2012 (n = 24, range = 673 – 1430 mg/l) indicate that the facility should be able to comply with the proposed limit.

The Ohio EPA risk assessment (Table 8) places bis(2-ethylhexyl)phthalate (BEHP) in group 5, which recommends limits to protect water quality. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), we are proposing monitoring, rather than limits, for this pollutant because the PEQ values (Table 3) may not be representative of its actual levels in the plant effluent.

The current permit, which became effective in August 2008, requires that the County collect BEHP samples in glass to avoid sample contamination from plastics. From August 2008 through August 2012, BEHP has been detected in only 1 of 17 samples tested by the County. Four Ohio EPA samples (December 2008 – April 2011), which were collected to avoid contamination, also were below detection. The purpose of the proposed monitoring is to collect data to demonstrate that BEHP remains at low levels in the Upper Mill Creek effluent.

Ohio EPA risk assessment (Table 8) places free cyanide in group 4. This placement as well as the data in Tables 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). A continuation of quarterly monitoring is proposed.

Ohio EPA risk assessment (Table 8) places cadmium, total chromium, dissolved hexavalent chromium, copper, lead, mercury, nickel and zinc 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 at a low frequency is proposed to document that these pollutants continue to remain at low levels.

Monitoring requirements proposed for the disposal of sewage sludge by the following management practices are based on OAC 3745-40: removal to sanitary landfill or transfer to another facility with an NPDES permit.

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.

Whole Effluent Toxicity Reasonable Potential

Based on evaluating the whole effluent toxicity data presented in Table 4 and other pertinent data under the provisions of OAC 3745-33-07(B), the Upper Mill Creek wastewater treatment plant is placed in Category 3 with respect to whole effluent toxicity.

Quarterly chronic testing with the determination of acute endpoints for a period of two years is proposed for *Ceriodaphnia dubia*. Annual testing is proposed for the remainder of the permit term. Trigger language for conducting a toxicity reduction evaluation (TRE) also is proposed. The frequency of the testing and including the TRE trigger is based on the magnitude of the County's June 2012 *C. dubia* result, 5.66 TUC, and the 100 percent *C. dubia* mortality that was observed in the composite sample of an April 2011 Ohio EPA acute screening test.

Toxicity to fathead minnows has not been observed in the plant's effluent. Annual chronic testing with the determination of acute end points is proposed consistent with the minimum monitoring requirements at OAC 3745-33-07(B)(11).

Other Requirements

Compliance Schedule

A six month compliance schedule is proposed for the County to submit a technical justification for either revising its local industrial user limits or retaining its existing local limits. If revisions to local limits are required, the County must also submit a pretreatment program modification request.

Sanitary Sewer Overflow Reporting

Provisions for reporting sanitary sewer overflows (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, Item A of the permit in accordance with rules adopted in December 2006. These rules require the Upper Mill Creek plant 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, Ohio Administrative Code rule revisions became effective that affect the requirements for certified operators for sewage collection systems and treatment works regulated under NPDES permits. Part II, Item A of this NPDES permit is included to implement rule 3745-7-02 of the Ohio Administrative Code (OAC). It requires the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

Storm Water Compliance

The Upper Mill Creek plant is covered under Ohio EPA’s industrial storm water general permit, coverage number 1GR00624*EG. Coverage was issued on February 25, 2012 and it expires on December 31, 2016. At that time, the County will need to submit a new NOI (notice of intent) to continue coverage under the general permit renewal or make other arrangements to comply with the industrial storm water regulations.

Outfall Signage

Part II of the permit includes requirements for the permittee to place a sign at each outfall to the East Fork Mill Creek providing information about the discharge. Signage at outfalls is required pursuant to Ohio Administrative Code 3745-33-08(A).

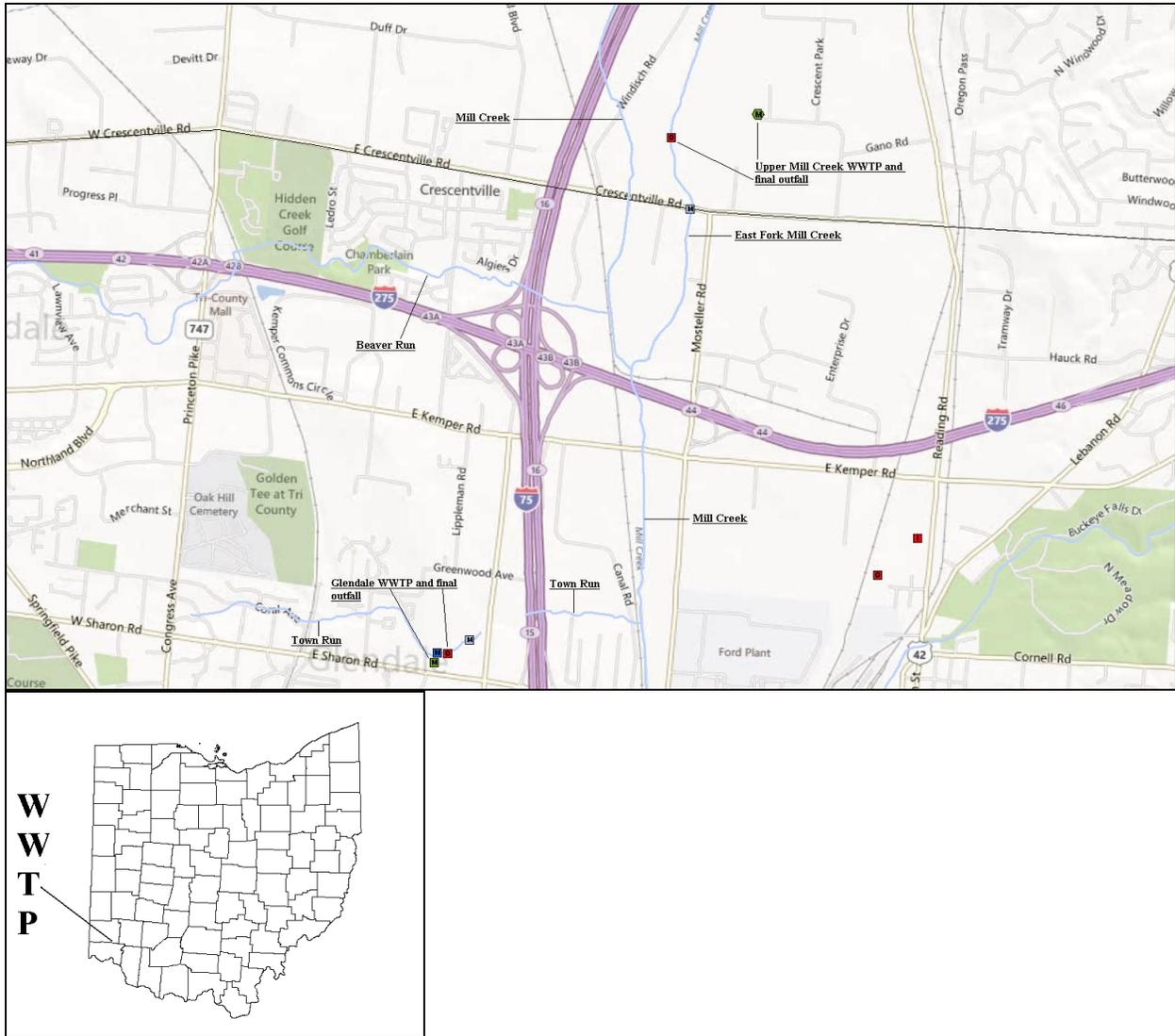


Figure 1. Location of Upper Mill Creek and Glendale wastewater treatment plants.

Table 1. Effluent Characterization Using Ohio EPA and Pretreatment Data

Summary of analytical results for Upper Mill Creek outfall 1PK00016001. Units ug/l unless otherwise noted; OEPA = data from analyses by Ohio EPA; PT = data from pretreatment program reports; NA = not analyzed; ND = not detected (detection limit).

PARAMETER	OEPA 04/19/11	OEPA 11/02/10	OEPA 04/28/09	OEPA 12/16/08	PT 07/27/11	PT 08/18/10	PT 07/29/09	PT 07/16/08	PT 05/09/07
Antimony	NA	NA	NA	NA	7.34	ND(5)	ND(5)	ND(5)	ND(5)
Barium	36	16	25	26	NA	NA	NA	NA	NA
Chromium	9.7	ND(2.0)	ND(2.0)	18.4	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Copper	5.8	4.5	4.1	4.5	ND(5)	ND(5)	5.62	ND(5)	1.4
Dissolved solids, total (mg/l)	880	1000	832	718	NA	NA	NA	NA	NA
Iron	215	ND(50)	ND(50)	132	NA	NA	NA	NA	NA
Nickel	131	4.6	2.8	20.5	ND(5)	ND(5)	ND(5)	ND(5)	2.4
Nitrate+nitrite-N	3.12	3.53	0.87	2.85	NA	NA	NA	NA	NA
Phosphorus, total	0.17	0.16	1.91	0.286	NA	NA	NA	NA	NA
Strontium	317	319	322	357	NA	NA	NA	NA	NA
Zinc	26	33	56	54	47.2	43.7	35.0	49.0	54.7
Bis(2-ethylhexyl) phthalate	ND(10.3)	ND(10.5)	ND(10.4)	ND(10.4)	11	ND(6)	ND(6)	26	36
Diethylphthalate	ND(5.2)	ND(5.3)	ND(5.2)	22.9	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroform	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5)	ND(5)	ND(5)	4.9	1.6
Phenol	ND(2.1)	4.9	ND(2.1)	ND(2.1)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)

Table 2. Effluent Characterization Using Self-Monitoring Data

Summary of current permit limits and unaltered discharge monitoring report data for Upper Mill Creek outfall 1PK00016001 (January 2007 – May 2012). 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.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
Water Temperature	Annual	C	Monitor		1973	18.7	24.5	11.2-26.9
Dissolved Oxygen	Summer	mg/l		6.0 min	945	8.3	7.3**	6.3-13.2
Dissolved Oxygen	Winter	mg/l		6.0 min	1025	9.51	8.7**	7.2-12.9
pH, Maximum	Annual	S.U.		9.0	567	7.7	7.99	7.1-8.9
pH, Minimum	Annual	S.U.		6.5	567	7.5	7.71	6.56-7.84
Residue, Total Dissolved	Annual	mg/l	Monitor		20	997	1360	673-1430
Total Suspended Solids	Annual	mg/l	12	18 ^a	1357	0	9	0-109
Oil and Grease, Hexane	Annual	mg/l		10	264	0	2	0-13
Nitrogen, Ammonia (NH ₃)	Summer	mg/l	1.0	1.5 ^a	655	0.1	0.906	0-15.2
Nitrogen, Ammonia (NH ₃)	Winter	mg/l	3.0	4.5 ^a	687	0.12	0.87	0-7.19
Nitrogen Kjeldahl, Total	Annual	mg/l	--		19	1.54	2.65	0.34-2.9
Nitrite Plus Nitrate, Total	Annual	mg/l	5.0	7.5 ^a	291	2.6	5.75	0-7.5
Phosphorus, Total (P)	Annual	mg/l	Monitor		377	0.5	1.5	0.1-4
Cyanide, Free	Annual	mg/l	Monitor		34	0	0	0-0.01
Nickel, Total Recoverable	Annual	ug/l	Monitor		66	2.35	5.55	0-8.14
Zinc, Total Recoverable	Annual	ug/l	Monitor		66	42.5	55.3	16.3-99.4
Cadmium, Total Recoverable	Annual	ug/l	Monitor		85	0	0.2	0-0.5
Lead, Total Recoverable	Annual	ug/l	Monitor		117	0	1.39	0-7.51
Chromium, Total Recoverable	Annual	ug/l	Monitor		66	0.745	1.4	0-6.99
Copper, Total Recoverable	Annual	ug/l	Monitor		66	0	3.94	0-7.8
Chromium, Dissolved Hexavalent	Annual	ug/l	Monitor		34	0	0	0-0
Fecal Coliform	Annual	#/100 ml	--		474	10	464	0-5700
E. coli	Annual	#/100 ml	161	362 ^a	137	13.5	238	0-2420
Bis(2-ethylhexyl) Phthalate	Annual	ug/l	Monitor		20	0	8.85	0-9.1
Flow Rate	Summer	MGD	Monitor		950	7.16	11.3	5.14-25.7
Flow Rate	Winter	MGD	Monitor		1027	8.17	13.9	5.14-44.5
Flow Rate	Annual	MGD	Monitor		1977	7.67	12.9	5.14-44.5
Mercury, Total (Low Level)	Annual	ng/l	Monitor		46	0.925	3.85	0-8.29
pH, Maximum	Annual	S.U.		9.0	1399	7.7	8.1	7-9
pH, Minimum	Annual	S.U.		6.5	1399	7.2*	7.7	6.72-8.1
Mercury, Total (Hg)	Annual	ug/l	Monitor		19	0.00118	0.0025	0-0.0084
CBOD 5 day	Summer	mg/l	10	15 ^a	662	0	4	0-11
CBOD 5 day	Winter	mg/l	10	15 ^a	689	2	4	0-14

Table 3. Projected Effluent Quality Values

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
<u>Self-Monitoring (DMR) Data</u>					
Dissolved Solids, total (TDS) ^A	mg/l	24	24	1185.4	1421
Ammonia-S	mg/l	422	407	0.341	0.77
Ammonia-W	mg/l	332	327	0.438	0.97
NO ₂ +NO ₃	mg/l	293	292	4.36	6.39
Phosphorus ^A	mg/l	379	379	0.94	1.49
Cyanide - free	µg/l	31	1	0.0088	0.012
Nickel - TR ^A	µg/l	66	58	5.34	8.24
Zinc - TR	µg/l	73	73	55.3	69.24
Cadmium – TR	µg/l	85	23	0.179	0.269
Lead - TR	µg/l	117	13	1.843	2.173
Chromium - TR ^A	µg/l	73	54	2.07	3.25
Copper - TR ^A	µg/l	73	26	4.70	6.83
Chromium ⁺⁶ , diss.	µg/l	34	0	--	--
Mercury – (Total LL) ^D	ng/l	46	40	2.957	4.733
Bis(2-ethylhexyl) Phthalate ^{A,C}	µg/l	29	8	31.54	43.2
Aldrin ^C	µg/l	5	0	--	--
Gamma-BHC (Total)	µg/l	5	0	--	--
Dieldrin ^C	µg/l	5	0	--	--
<u>Other Data</u> ^B					
Antimony – TR	µg/l	5	1	12.32	16.88
Barium – TR	µg/l	4	4	68.33	93.6
Iron – TR	µg/l	4	2	408.1	559
Strontium - TR	µg/l	4	4	677.6	928.2
Diethyl phthalate ^C	µg/l	9	3	30.1	41.2
Chloroform ^C	µg/l	9	2	6.57	9
Phenol	µg/l	4	1	9.3	12.7

^A Data from other sources^B were included in PEQ calculation.

^B Other data sources include pretreatment program reports and Ohio EPA data.

^C Carcinogen

^D The reporting method for mercury changed in August 2008 and only results after this date are used.

Table 4. Summary of acute and chronic toxicity test results.

Test Date(a)	<i>Ceriodaphnia dubia</i> 48 hours	<i>Fathead Minnows</i> 96 hours	<i>Ceriodaphnia dubia</i> 7 days	<i>Fathead Minnows</i> 7 days
	TUa ^b	TUa ^b	TUc ^b	TUc ^b
06/19/07(E)	BD	BD	2.67	BD
12/10/07(E)	BD	BD	BD	BD
06/10/08(E)	BD	BD	BD	BD
06/25/09(E)	BD	BD	BD	BD
06/01/10(E)	BD	BD	BD	BD
06/14/11(E)	BD	BD	BD	BD
06/25/12(E)	BD	BD	5.66	BD
12/16/08(O)*	BD	BD	NT	NT
04/28/09(O)*	BD	BD	NT	NT
11/02/10(O)*	BD	BD	NT	NT
04/19, 20/11(O)*#	BD	BD	NT	NT
04/19-20/11(O)*&	100% mortality	BD	NT	NT

^a O = EPA test; E = entity test

^b TUa = acute toxicity units, TUc = chronic toxicity units

BD = below detection

NT = not tested

* = 48 hour screening test

= grab samples

& = composite sample

Table 5. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Average				
		Human Health	Agri-culture	Aquatic Life		
Antimony – TR	ug/l	4300	--	190	900	1800
Arsenic – TR	ug/l	--	100	150	340	680
Barium – TR	ug/l	--	--	220	2000	4000
Bis(2-ethylhexyl)phthalate	ug/l	59	--	8.4	1100	2100
Cadmium – TR ^A	ug/l	--	50	5.1	13	25
Chloroform (Trichloromethane)	ug/l	4700	--	140	1300	2600
Chromium – TR ^A	ug/l	--	100	180	7600	3800
Chromium VI - Diss	ug/l	--	--	11	16	31
Copper – TR ^A	ug/l	1300	500	20	33	66
Cyanide - free	mg/l	220	--	0.012	0.046	0.092
Diethyl phthalate	ug/l	120000	--	220	280	2000
Dissolved solids (ave)	mg/l	--	--	1500	--	--
Iron – TR ^A	ug/l	--	5000	--	--	--
Lead – TR ^A	ug/l	--	100	21	390	690
Mercury - TR ^B	ng/l	12	10000	910	1700	3400
Molybdenum – TR	ug/l	--	--	20000	190000	370000
Nickel – TR ^A	ug/l	4600	200	110	1000	2000
Nitrate-N + Nitrite-N	mg/l	--	100	--	--	--
Phenol	ug/l	4600000	--	400	4700	9400
Selenium – TR	ug/l	11000	50	5	--	--
Silver - TR ^A	ug/l	--	--	1.3	7.7	15
Strontium - TR	ug/l	--	--	21000	40000	81000
Zinc – TR ^A	ug/l	69000	25000	260	260	520

^A Aquatic life criteria is hardness-based.

^B Bioaccumulative chemical of concern (BCC)

Table 6. Instream Conditions and Discharger Flow

Parameter	Units		Value	Basis
East Fork Mill Creek UPST Butler County Upper Mill Creek WWTP				
7Q10	cfs	annual	0.54	USGS gage #03255500
1Q10	cfs	annual	0.30	USGS gage #03255500
30Q10	cfs	summer	0.94	USGS gage #03255500
		winter	1.05	USGS gage #03255500
Harmonic Mean Flow	cfs	annual	2.22	USGS gage #03255500
Mixing Assumption	%	average	100	Stream-to-discharge ratio
	%	maximum	100	Stream-to-discharge ratio
Instream Hardness	mg/l	annual	250	901 Station; n=63; 2007-12
Background Water Quality for the East Fork Mill Creek				
Antimony – TR	ug/l		0	No representative data available.
Arsenic – TR	ug/l		2.2	STORET; n=5; 3<MDL; 2002;
Barium – TR	ug/l		51.6	STORET; n=5; 5<MDL; 2002;
Bis(2-ethylhexyl)phthalate	ug/l		0	No representative data available.
Cadmium - TR	ug/l		0	STORET; n=5; 5<MDL; 2002;
Chromium - TR	ug/l		0	STORET; n=5; 5<MDL; 2002;
Chromium VI - Diss	ug/l		0	No representative data available.
Copper – TR	ug/l		0	STORET; n=5; 5<MDL; 2002;
Cyanide - free	mg/l		0	STORET; n=5; 5<MDL; 2002;
Dissolved solids	mg/l		397	STORET; n=5; 0<MDL; 2002;
Lead – TR	ug/l		0	STORET; n=5; 5<MDL; 2002;
Mercury - TR	ng/l		0	STORET; n=5; 5<MDL; 2002;
Molybdenum – TR	ug/l		0	No representative data available.
Nickel – TR	ug/l		0	STORETn=5; 5<MDL; ; 2002;
Phosphorus	mg/l		0.118	STORET; n=5; 0<MDL; 2002;
Selenium – TR	ug/l		0	STORET; n=5; 5<MDL; 2002;
Silver - TR	ug/l		0	No representative data available.
Zinc - TR	ug/l		0	No representative data available.
Butler Co. Upper Mill Creek WWTP flow				
	cfs (mgd)		24.75(16.0)	DSW

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

Parameter	Units	Average			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Human Health	Agri Supply	Aquatic Life		
Antimony - TR ^B	ug/l	4686 ^A	--	194	910	1800
Arsenic - TR ^B	ug/l	--	109	153	344	680
Barium - TR ^B	ug/l	--	--	224	2024	4000
Bis(2-ethylhexyl)phthalate	ug/l	64	--	8.6	1113	2100
Cadmium - TR ^B	ug/l	--	54 ^A	5.2	13	25
Chromium - TR ^B	ug/l	--	109	184	3846	7600
Chromium VI - Diss ^B	ug/l	--	--	11	16	31
Copper - TR ^B	ug/l	1417 ^A	545 ^A	20	33	66
Cyanide - free	mg/l	240 ^A	--	0.012	0.047	0.092
Dissolved Solids	mg/l	--	--	1524	--	--
Lead - TR ^B	ug/l	--	109	21	395	790
Mercury - TR ^C	ng/l	12	10000 ^A	910	1700	3400
Molybdenum - TR ^B	ug/l	--	--	20436	192303	370000
Nickel - TR ^B	ug/l	5013 ^A	218	112	1012	2000
Selenium - TR ^B	ug/l	11987	54	5.1	--	--
Silver - TR ^B	ug/l	--	--	1.3	7.8	15
Zinc - TR	ug/l	75189 ^A	27242	266	263	520

^A Allocation must not exceed the Inside Mixing Zone Maximum.

^B Parameter would not require a WLA based on reasonable potential procedures, but allocation requested for use in pretreatment program.

^C BCC; criteria must be met at end-of-pipe unless the requirements for an exemption are listed in

3745-2-

Table 9. Final Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations				Basis ^b
		Concentration		Loading (kg/day) ^a		
		Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	
Temperature	°C	----- Monitor -----				M
Dissolved Oxygen	mg/l	6.0 minimum		--	--	BADCT, EP
Suspended Solids	mg/l	12	18 ^c	727	1100 ^c	BADCT, EP
Oil and Grease	mg/l	--	10	--	--	WQS, EP
Ammonia-N	mg/l					
Summer		1.0	1.5 ^c	60.6	90.9 ^c	BADCT, EP
Winter		3.0	4.5 ^c	182	273 ^c	BADCT, EP
Nitrite(N) + Nitrate(N)	mg/l	5.0	7.5 ^c	303	455 ^c	TMDL, BEJ
Phosphorus, Total	mg/l	1.0	1.5 ^c	60.6	90.9 ^c	TMDL, BEJ
Cyanide, Free	mg/l	----- Monitor -----				RP
Nickel, T. R.	µg/l	----- Monitor -----				M
Zinc, T. R.	µg/l	----- Monitor -----				M
Cadmium, T. R.	µg/l	----- Monitor -----				M
Lead, T. R.	µg/l	----- Monitor -----				M
Chromium, T. R.	µg/l	----- Monitor -----				M
Copper, T. R.	µg/l	----- Monitor -----				M
Hex. Chromium (Dissolved)	µg/l	----- Monitor -----				M
<i>E. coli</i>						
Summer Only	#/100ml	161	362 ^c	--	--	WQS, EP
Bis(2-ethylhexyl) phthalate	µg/l	----- Monitor -----				RP
Flow	MGD	----- Monitor -----				M
Mercury, T.	ng/l	----- Monitor -----				M
Whole Effluent Toxicity						
<i>C. dubia</i> , Acute	TUa	----- Monitor/trigger -----				WET/RP
<i>C. dubia</i> , Chronic	TUc	----- Monitor/trigger -----				WET/RP
<i>P. promelas</i> , Acute	TUa	----- Monitor -----				WET
<i>P. promelas</i> , Chronic	TUc	----- Monitor -----				WET
pH	S.U.	----- 6.5 to 9.0 -----				WQS, EP
Total Filterable Residue (Dissolved Solids)	mg/l	1524	--	92300	--	WLA
CBOD ₅	mg/l	10	15 ^c	606	909 ^c	BADCT, EP

^a Effluent loadings based on average design discharge flow of 16.0 MGD.

^b **Definitions:** BADCT = Antidegradation required treatment technology (Table 5-1 of Antidegradation Rule, OAC 3745-1-05); EP = Existing Permit; M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits [OAC 3745-33-07(A)]; TMDL = Total Maximum Daily Loads for the Mill Creek Basin (Ohio EPA; Approved, April 26, 2005); WET = Minimum testing requirements for whole effluent toxicity [OAC 3745-33-07(B)(11)]; WET/RP = Reasonable potential for requiring water quality-based effluent limits and monitoring requirements for whole effluent toxicity in NPDES permits [OAC 3745-33-07(B)]; WLA = Wasteload Allocation procedures (OAC 3745-2); WQS = Ohio Water Quality Standards (OAC 3745-1-07).

^c Weekly average limit.