National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for the Bluffton Wastewater Treatment Plant

Public Notice No.: 16-10-054
Public Notice Date: October 31, 2016
Comment Period Ends: November 30, 2016

Ohio EPA Permit No.: 2PC00005*LD
Application No.: OH0020851

Name and Address of Applicant:
Village of Bluffton
P.O. Box 63
Bluffton, Ohio 45817

Name and Address of Facility Where Discharge Occurs:
Bluffton Wastewater Treatment Plant
450 North Spring Street
Bluffton, Ohio 45817
Allen County

Receiving Water: Riley Creek

Subsequent Stream Network: Blanchard River, Auglaize River, Maumee River, Lake Erie

INTRODUCTION

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

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

No antidegradation review was necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the CWA. Many of these have already been established by the United States Environmental Protection Agency (U.S. EPA) in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations (WLAs) are used to develop these limits based on the pollutants that have been detected in the

discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

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

SUMMARY OF PERMIT CONDITIONS

The effluent limits and 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, 5-day carbonaceous biochemical oxygen demand (CBOD5), total suspended solids, ammonia, total phosphorus, nitrite+nitrate, total kjeldahl nitrogen, oil and grease, pH, cadmium, chromium, dissolved hexavalent chromium, nickel and zinc.

New final effluent limits are proposed for *Escherichia coli*. New WQS for *E. coli* became effective in April 2016. No compliance schedule is proposed for meeting these new final effluent limits. Based on best technical judgment, it is expected the facility will be able to comply when the permit becomes effective.

A lower, variance based limit is proposed for mercury.

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.

Limits are proposed to be removed for lead and copper based on the WLA. Monitoring is proposed to continue.

In accordance with Ohio Administrative Code (OAC) 3745-33-07, it has been determined that the effluent from Bluffton wastewater plant shows reasonable potential for chronic toxicity to *Ceriodaphnia dubia*. Limits and an increased monitoring frequency for chronic whole effluent toxicity with acute endpoints for *Ceriodaphnia dubia* are proposed. A schedule of compliance to meet the proposed limits is included in Part I.C of the permit.

Annual chronic toxicity monitoring for *Pimephales promelas* with the determination of acute endpoints is proposed to continue.

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; mercury variance; and outfall signage.

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PROCEDURES FOR PARTICIPATION IN THE FORMULATION OF FINAL DETERMINATIONS

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

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

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be 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 Peggy Christie, 419-373-3006, Peggy.Christie@epa.ohio.gov, 347 North Dunbridge Road, Bowling Green, Ohio 43402-9398.

INFORMATION REGARDING CERTAIN WATER QUALITY BASED EFFLUENT LIMITS

This draft permit may contain proposed water-quality-based effluent limits (WQBELs) for parameters that **are not** priority pollutants. (See the following link for a list of the priority pollutants: http://epa.ohio.gov/portals/35/pretreatment/Pretreatment_Program_Priority_Pollutant_Detection_Limits.pdf .) In accordance with ORC 6111.03(J)(3), the Director established these WQBELs after considering, to the extent consistent with the Federal Water Pollution Control Act, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to accomplishment of the purposes of this chapter. This determination was made based on data and information

available at the time the permit was drafted, which included the contents of the timely submitted NPDES permit renewal application, along with any and all pertinent information available to the Director.

This public notice allows the permittee to provide to the Director for consideration during this public comment period additional site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness for achieving compliance with the proposed final effluent limitations for these parameters. The permittee shall deliver or mail this information to:

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

Should the applicant need additional time to review, obtain or develop site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness of achieving compliance with these limitations, 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 Bluffton wastewater treatment plant discharges to Riley Creek at River Mile 15.4. Figure 1 shows the approximate location of the facility.

This segment of Riley Creek is described by Ohio EPA River Code: 04-148, Hydrologic Unit Code: 04100008-04-04, County: Allen, Ecoregion: Eastern Corn Belt Plains. Riley Creek is designated for the following uses under Ohio's WQS (OAC 3745-1-11): Warmwater Habitat, Agricultural Water Supply, Industrial Water Supply, Primary Contact Recreation.

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

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

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact Recreation) and wading only (Secondary Contact which are generally waters too shallow for swimming or canoeing).

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural water supply and industrial water supply.

FACILITY DESCRIPTION

The Bluffton wastewater plant was constructed in 2003. The average design flow is 1.9 million gallons per day (MGD). Bluffton wastewater plant serves the Village of Bluffton. Bluffton wastewater plant has the following treatment processes which are shown on Figure 2:

- Influent Pumping
- Bar Screen
- Grit Removal
- Activated Sludge - Conventional
- Secondary Clarification
- Ultraviolet Disinfection
- Post Aeration
- Sodium Aluminate Addition

The facility submitted a permit-to-install application for upgrades to the screening process with the installation of a drum screen. The permit-to-install was approved on April 18, 2016.

The Village of Bluffton has 100% separated sewers and 0% combined sewers in the collection system.

The Village of Bluffton does not have an approved pretreatment program. The Village of Bluffton has three categorical users that discharge 0.0504 MGD of flow.

The Village of Bluffton's potable water comes from the Village of Ottawa.

Bluffton wastewater plant utilizes the following sewage sludge treatment processes:

- Aerobic Digestion
- Belt Filter Press

Treated sludge is land applied.

DESCRIPTION OF EXISTING DISCHARGE

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

Table 2 presents chemical specific data compiled from data collected by Ohio EPA.

Table 3 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period of January 2011 through December 2015, and current permit limits are provided for comparison.

Table 4 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 5 summarizes the results of acute and chronic WET tests of the final effluent.

Table 6 summarizes the screening results of Ohio EPA bioassay sampling 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 from effluent testing conducted by the Agency.

ASSESSMENT OF IMPACT ON RECEIVING WATERS

The Blanchard River watershed assessment unit, which includes the Riley Creek in the vicinity of the Bluffton wastewater plant, is listed as impaired on Ohio's 303(d) list.

A Total Daily Maximum Load (TMDL) report was approved for the Blanchard River Watershed (Final Report, May 22, 2009) on July 2, 2009. The March 24, 2015, Supreme Court of Ohio decision *Fairfield Cty. Bd. of Commrs. v. Nally, Slip Opinion No. 2015-Ohio-991* vacated all previously approved TMDLs. As of April 20, 2016, this TMDL is considered a technical guidance document pending final TMDL approval.

An assessment of the impact of a permitted point source on the immediate receiving waters includes an evaluation of the available chemical/physical, biological, and habitat data which have been collected by Ohio EPA pursuant to the Five-Year Basin Approach for Monitoring and NPDES Reissuance. Other data may be used provided it was collected in accordance with Ohio EPA methods and protocols as specified by the Ohio WQS and Ohio EPA guidance documents. Other information which may be evaluated includes, but is not limited to: NPDES permittee self-monitoring data; effluent and mixing zone bioassays conducted by Ohio EPA, the permittee, or U.S. EPA.

In evaluating this data, Ohio EPA attempts to link environmental stresses and measured pollutant exposure to the health and diversity of biological communities. Stresses can include pollutant discharges (permitted and unpermitted),

land use effects, and habitat modifications. Indicators of exposure to these stresses include whole effluent toxicity tests, fish tissue chemical data, and fish health biomarkers (for example, fish blood tests).

Use attainment is a term which describes the degree to which environmental indicators are either above or below criteria specified by the Ohio WQS (OAC 3745-1). Assessing use attainment status for aquatic life uses primarily relies on the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-15). These criteria apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on measuring several characteristics of the fish and macroinvertebrate communities; these characteristics are combined into multimetric biological indices including the Index of Biotic Integrity and modified Index of Well-Being, which indicate the response of the fish community, and the Invertebrate Community Index, which indicates the response of the macroinvertebrate community. Numerical criteria are broken down by ecoregion, use designation, and stream or river size. Ohio has five ecoregions defined by common topography, land use, potential vegetation and soil type.

Three attainment status results are possible at each sampling location -full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails meet the biocriteria. Nonattainment means that either none of the applicable indices meet the biocriteria or one of the organism groups indicates poor or very poor performance. An aquatic life use attainment table (see Table 7) is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (i.e., full, partial, or non), the Qualitative Habitat Evaluation Index, and comments and observations for each sampling location.

The segment of Riley Creek upstream of the Bluffton WWTP is considered to be in partial attainment for aquatic life and recreational use due to organic enrichment/DO, thermal modification, nutrients and bacteria caused by crop production, groundwater loadings, low DO and CSOs. The segment of Riley Creek downstream of the Bluffton WWTP is considered to be in non-attainment for aquatic life due to nutrients, siltation, organic enrichment/DO and bacteria caused by crop production, CSOs, urban runoff and municipal point sources. The TMDL report did not include any recommendations for the Bluffton WWTP regarding nutrient reduction beyond meeting the 1.0 mg/l limit that is in the current NPDES permit. There also were no recommendations regarding pathogens/bacteria.

The TMDL is available through the Ohio EPA, Division of Surface Water website at:
http://epa.ohio.gov/portals/35/tmdl/BlanchardRiverTMDL_final_may09_wo_app.pdf

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 Bluffton wastewater plant were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA, DMR data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR)	January 2011 through December 2015
Ohio EPA compliance sampling data	2014

Statistical Outliers and Other Non-Representative Data

The data were examined and the following values were removed from the evaluation as non-representative data: copper – 0.016 ug/l, 10/14/2011 because it is significantly below the all other data points and below the reported detection limit for the other values; nitrite plus nitrate - three very low values because they were significantly below

the other data points; and total filterable residue - nine values because they were significantly low then the others and to give a more reliable projection of effluent quality.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points (see Table 4).

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required (see Table 8).

Wasteload Allocation

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

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

Aquatic life (Warmwater Habitat)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer 30Q10
		Winter 30Q10
Wildlife		Annual 90Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 9, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

The data used in the WLA are listed in Table and Table 9. The WLA results to maintain all applicable criteria are presented in

Table 10. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

Whole Effluent Toxicity Wasteload Allocation

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 the Bluffton wastewater plant, the WLA values are 0.3 TU_a and 1.03 TU_c.

The chronic toxicity unit (TU_c) is defined as 100 divided by the estimate of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms (IC_{25}):

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

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations except when the following equation is more restrictive (*Ceriodaphnia dubia* only):

TU_c = 100/geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration

The acute toxicity unit (TU_a) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life (LC_{50}) for the most sensitive test species:

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

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

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

Dilution Ratio (downstream flow to discharger flow)	Allowable Effluent Toxicity (percent effects in 100% effluent)
up to 2 to 1	30
greater than 2 to 1 but less than 2.7 to 1	40
2.7 to 1 to 3.3 to 1	50

$$\text{Stream Dilution Ratio} = \frac{1Q10 + [\text{WWTP flow rate}]}{[\text{WWTP flow rate}]} = \frac{[X]\text{ cfs} + [Y]\text{ cfs}}{[Y]\text{ cfs}} = [Z]$$

The acute WLA for Bluffton wastewater plant is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1.1 to 1.

REASONABLE POTENTIAL/EFFLUENT LIMITS/MANAGEMENT DECISIONS

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 8. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 4, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 111.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 12 presents the final effluent limits and monitoring requirements proposed for the Bluffton wastewater plant outfall 001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Dissolved Oxygen, Total Suspended Solids, Ammonia and CBOD5
The limits proposed for dissolved oxygen, total suspended solids, ammonia and 5-day carbonaceous biochemical oxygen demand are all based on plant design criteria and are a continuation of the existing permit limits. These limits are protective of WQS.

The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

Oil & Grease, pH, and E. coli
Limits proposed for oil and grease, pH, and *Escherichia coli* are based on WQS (OAC 3745-1-07). Primary contact recreation *E. coli* standards apply to the Riley Creek.

New WQS for *E. coli* for receiving waters formerly designated as Class B or C Primary Contact Recreation waters became effective in April 2016, and new final effluent limits are proposed. No compliance schedule is proposed for meeting these new final effluent limits. Based on best technical judgment, it is expected the facility will be able to comply when the permit becomes effective.

Phosphorus
Phosphorus is limited based on provisions of OAC 3745-33-06(C).

Cadmium, Chromium, Copper, Lead, Nickel, Nitrate+Nitrite, Total Filterable Residue and Zinc
The Ohio EPA risk assessment (Table 11) places Cadmium, Chromium, Copper, Lead, Nickel, Nitrate N + Nitrite N, Total Filterable Residue and Zinc in groups 2 and 3. This placement, as well as the data in Tables 3 & 4, 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 quarterly frequency is proposed for Cadmium to document that it continues to remain at low levels. Monitoring frequency for Chromium, Nitrate+Nitrite, Total Filterable Residue and Zinc will remain unchanged. Limits for Copper and Lead are proposed to be removed and monitoring will continue at a reduced frequency (quarterly) for Lead and at the same frequency (monthly) for Copper.

Aluminum, Chloroform, Cyanide, Iron and Strontium
The Ohio EPA risk assessment (Table 11) places Aluminum, Chloroform, Cyanide, Iron and Strontium in groups 2 and 3. This placement, as well as the data in Tables 3 and 4 support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. No new monitoring is proposed for Aluminum, Chloroform, Cyanide, Iron and Strontium.

Total Kjedahl Nitrogen (TKN) and Nitrite Plus Nitrate
Monitoring for TKN and Nitrite plus Nitrate is proposed to continue. Riley Creek is impaired downstream of Bluffton WWTP with nutrients listed as a cause and Bluffton WWTP is listed as a source. Monitoring TKN at the upstream (801) and downstream (901) stations is also proposed and consistent with Ohio EPA Division of Surface Water NPDES Permit Guidance 1. The purpose of the monitoring is to maintain a data set tracking nutrient levels in Riley Creek and may be used for future permit decisions relating to nutrients.

Dissolved 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.

Mercury Reasonable Potential and Mercury Variance
The Bluffton wastewater plant permit includes a mercury variance, and variance-based limits for mercury in the previous permit renewal. Based on the monitoring results from January 2011 through December 2015, and the new application information, the Bluffton wastewater plant has determined that the facility will not meet the 30-day average permit limit of 1.3 ng/l. However, the effluent data shows that the permittee can meet the mercury annual average value of 12 ng/l. The permittee's application has also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based upon these demonstrations, the Bluffton wastewater plant is eligible for the mercury variance under OAC 3745-33-07(D)(10)(a).

Bluffton wastewater plant submitted information supporting the renewal of the variance. The permittee plan of study includes continued monitoring of the collection system, continuation of a public education through a pamphlet for residents and continuation of a Mercury Reduction Initiative for area businesses to reduce the amount of mercury coming being discharged. The calculation of the PEQ_{avg} value from 2011 to 2015 compared to the PEQ_{avg} calculated at the time the original variance was issued shows a reduction from 8.4 ng/l to 5.6 ng/l. The Pollutant Minimization Program (PMP) schedule developed from the original variance continues to be implemented, and further reductions in mercury may be possible.

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the OAC. A condition in Part II of the NPDES permit lists the provisions of the mercury variance, and includes the following requirements:

- A variance-based monthly average effluent limit of 5.6 ng/l, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee make reasonable progress to meet the WQBEL for mercury by implementing the plan of study, which has been developed as part of the PMP;
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/l as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average WQBEL for mercury has not been achieved.

Whole Effluent Toxicity Reasonable Potential
The annual requirements for acute and chronic whole effluent toxicity (WET) testing for the species Pimephales promelas are proposed to continue as in the current permit.

The requirements for the species Ceriodaphnia dubia (C. dubia) have changed. Evaluating the acute and chronic toxicity results in Table 5 and Table 6 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, gives a chronic value PEQ of 1.74 TU_c for *Ceriodaphnia dubia*. Reasonable potential for chronic toxicity is demonstrated, since the PEQ value exceeds the WLA value of 1.03 TU_c. PEQ values for acute toxicity cannot be calculated because there was no detection of acute toxicity in the 11 samples measured. Reasonable potential for acute toxicity is not demonstrated because non-detections do not exceed the WLA value of 0.3 TUa. Consistent with Procedure 6 and OAC 3745-33-07(B), effluent limits are proposed for whole effluent toxicity. It is proposed that the final effluent limits for toxicity become effective 52 months from the permit effective date if a toxicity reduction evaluation (TRE) is triggered under the conditions specified in Part II, Item T of the permit. Quarterly monitoring for 24 months with the trigger mechanism is proposed as the interim condition.

The proposed limits for toxicity were derived from the wasteload allocation values of 0.3 TUa and 1.03 TUc using the procedures in section 5.4, "Permit Limit Derivation", of the Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001, U.S. EPA, March 1991). A coefficient of variation of 0.5 and an acute-to-chronic ratio of 10 were used in the calculations. Based on the calculations, a daily maximum limit of 1.6 TUc and a monthly average limit of 1.0 TUc are proposed.

A compliance schedule is proposed that includes a requirement for an initial TRE investigation if toxicity is detected, outlines requirements for the TRE if one is necessary, and requires compliance with the final limits for chronic toxicity.

A reopener clause is proposed in Part II of the permit that would allow the City to request a permit modification to remove the limits for WET. The request must be based on the results of at least eight definitive chronic toxicity tests conducted over a period of two years that show there is no reasonable potential for the plant's discharge to cause or contribute to a violation of the criteria for WET.

Additional Monitoring Requirements
New monitoring for TKN is being proposed at both the upstream and downstream monitoring stations 801 and 901 to maintain further nutrient data for this reach of Riley Creek.

Additional monitoring requirements proposed at the final effluent, influent and upstream/downstream stations are included for all facilities in Ohio and vary according to the type and size of the discharge. In addition to permit compliance, this data is used to assist in the evaluation of effluent quality and treatment plant performance and for designing plant improvements and conducting future stream studies.

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

OTHER REQUIREMENTS

Phosphorus Optimization - The permittee shall prepare and submit a Phosphorus Discharge Optimization Evaluation plan to Ohio EPA Northwest District Office. The plan shall be completed and submitted to Ohio EPA no later than 12 months from the effective date of this permit. Details are in Part I.C of the permit.

Sanitary Sewer Overflow Reporting
Provisions for reporting SSOs are again proposed in this permit. These provisions include: the reporting of the system-wide number of SSO occurrences on monthly operating reports; telephone notification of Ohio EPA and the local health department, and 5-day follow up written reports for certain high risk SSOs; and preparation of an annual report that is submitted to Ohio EPA and made available to the public. Many of these provisions were already required under the “Noncompliance Notification”, “Records Retention”, and “Facility Operation and Quality Control” general conditions in Part III of Ohio NPDES permits.

Operator of Record
Operator certification requirements have been included in Part II of the permit in accordance with rules adopted in December 2006 (OAC 3745-7-02). These rules require the Bluffton wastewater plant to have a Class III wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001. These rules also require the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

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

Storm Water Compliance
In order to comply with industrial storm water regulations, the permittee submitted a form for "No Exposure Certification" which was signed on June 23, 2016. Compliance with the industrial storm water regulations must be re-affirmed every five years. No later than June 23, 2021, the permittee must submit a new form for "No Exposure Certification" or make other provisions to comply with the industrial storm water regulations.

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

Figure 1. Location of Bluffton WWTP

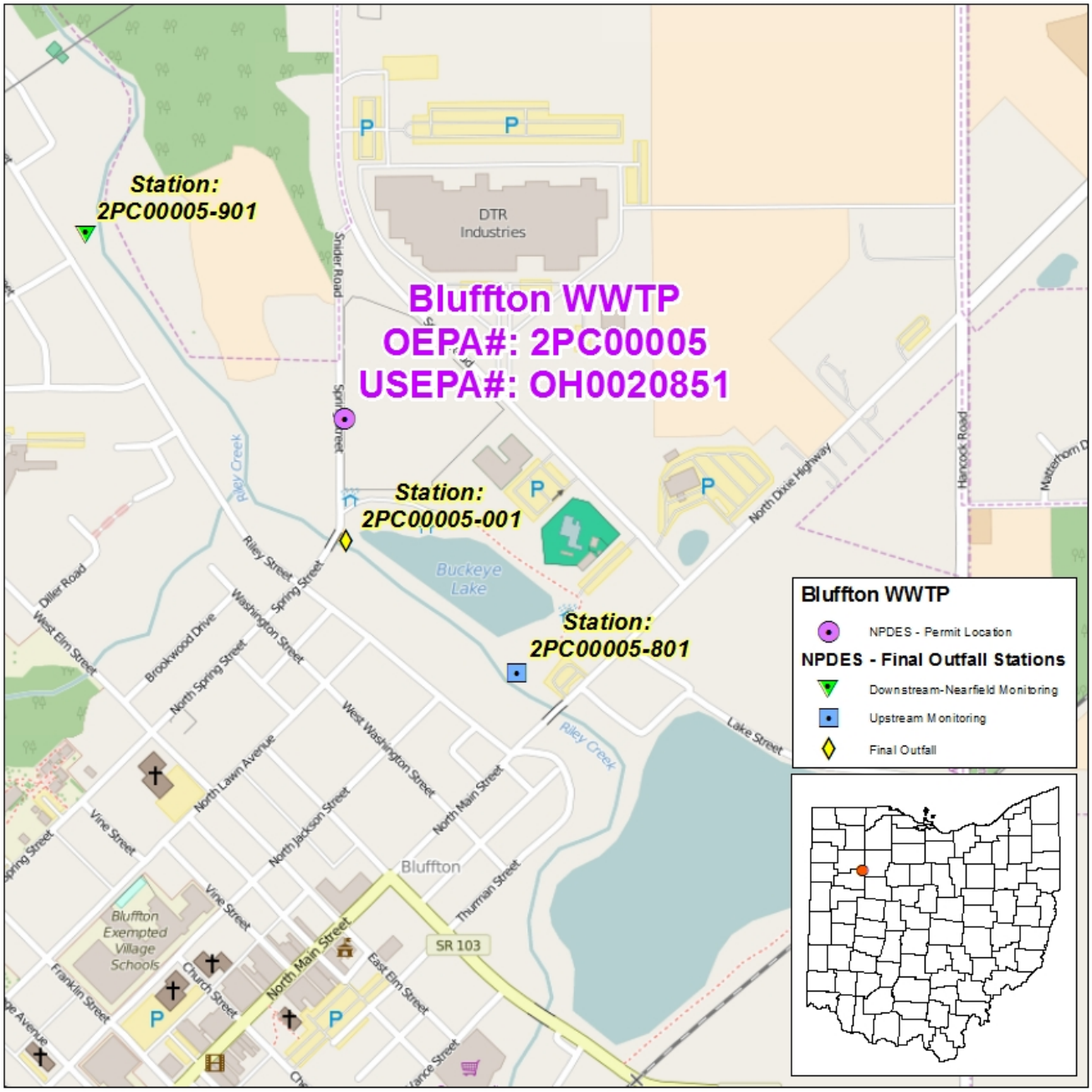

Figure 2. Diagram of Wastewater Treatment System

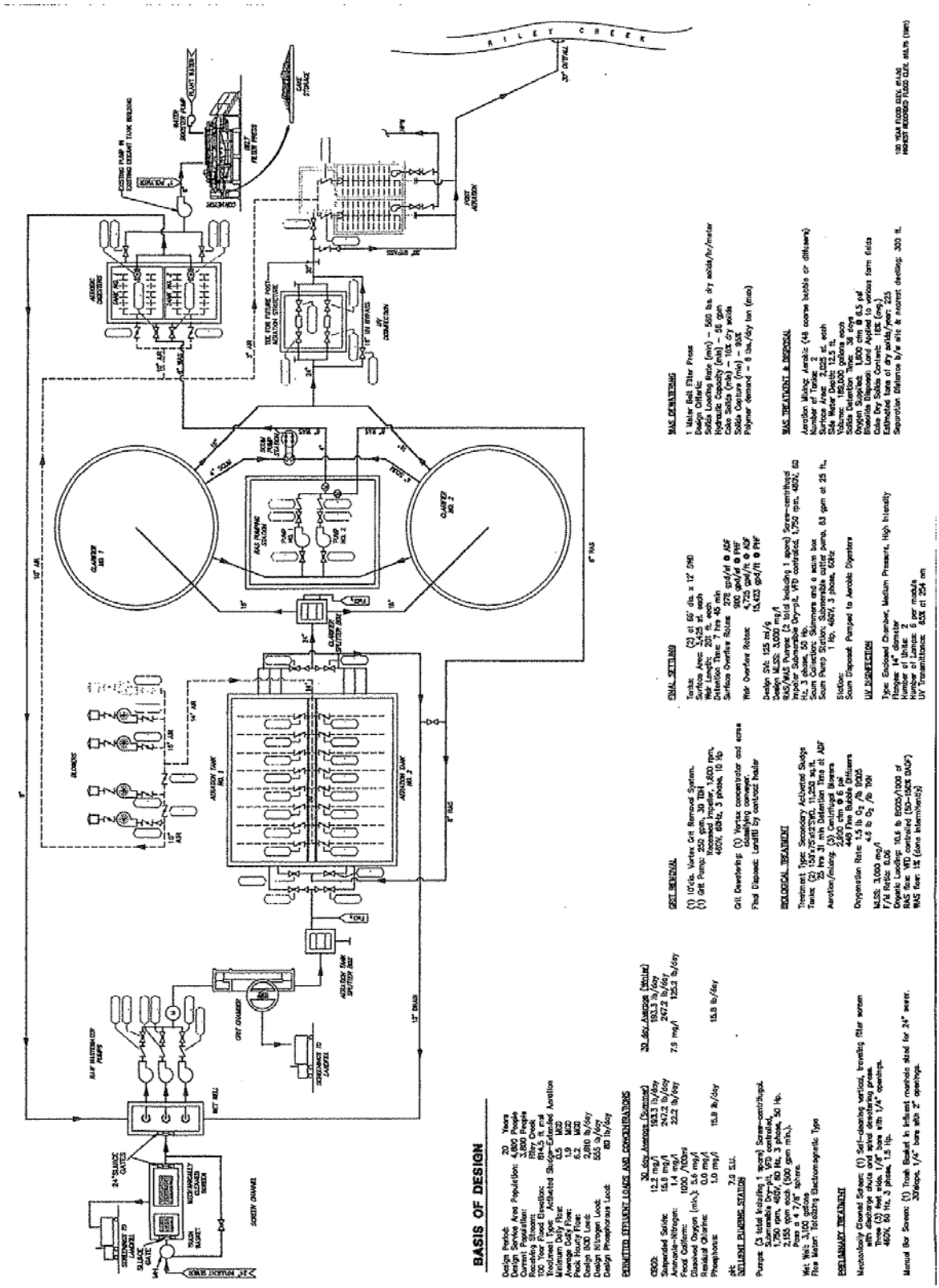

Table 1. Calculated Phosphorus Loadings from 2011 - 2015

For Months May - October			
Year	**Median Phosphorus (mg/l)**	**Median Flow (MGD)**	**Median Loading (kg/day)**
2011	0.175	0.5895	0.417
2012	0.14	0.515	0.305
2013	0.075	0.5605	0.174
2014	0.075	0.534	0.139
2015	0.09	0.635	0.235

MGD = million gallons per day

Table 2. Effluent Characterization Using Ohio EPA data

NAME	UNITS	10/21/2014	11/14/2014
Aluminum	µg/L	712	699
Ammonia	mg/L	AA (0.050)	AA (0.050)
Arsenic	µg/L	AA(2)	AA(2)
Barium	µg/L	41	38
Cadmium	µg/L	AA (0.2)	AA (0.2)
CBOD (5 day)	mg/L	AA(2.0)	AA(2.0)
COD	mg/L	AA(20)	AA(20)
Chloride	mg/L	151	173
Chloroform	µg/L	0.77	AA(0.50)
Chromium	µg/L	AA(2.0)	AA(2.0)
Copper	µg/L	9.5	9.5
Cyanide, Free	µg/L	AA(5)	AA(5)
Iron	µg/L	104	83
Lead	µg/L	AA(2.0)	AA(2.0)
Magnesium	mg/L	17.2	17.9
Manganese	µg/L	AA(10)	AA(10)
Nickel	µg/L	8.3	6.8
Nitrate+Nitrite	mg/L	30.4	30.3
Oil & Grease	mg/L	AA(2.2)	AA(2.2)
Phosphorus	mg/L	0.261	0.261
Selenium	µg/L	AA(2.0)	AA(2.0)
Strontium	µg/L	1390	1660
Total Dissolved Solids	mg/L	702	718
Total Kjeldahl Nitrogen	mg/L	AA(0.20)	AA(0.20)
Total Suspended Solids	mg/L	9	9
Zinc	µg/L	18	28

AA = not detected (analytical method detection limit)

Table 3. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Outfall 001								
Water Temperature	Annual	°C	- - - -Monitor- - - -		1826	15	23	1-27
Dissolved Oxygen	Annual	mg/l	5.6 Minimum		1818	8.9	12.3	5.6-19
Total Suspended Solids	Annual	mg/l	15.6	23.4[a]	720	0	9.2	0-30
		kg/day	112	168	--	--	--	--
Oil and Grease	Annual	mg/l	10.0 Maximum		70	0	0	0-5.4
Ammonia	Summer	mg/l	1.4	2.1[a]	360	0	0	0-5.48
		kg/day	10.1	15.1	--	--	--	--
Ammonia	Winter	mg/l	7.9	11.9[a]	360	0	4.02	0-17.7
		kg/day	56.8	85.6	--	--	--	--
Total Kjeldahl Nitrogen	Annual	mg/l	- - - -Monitor- - - -		48	0	1.32	0-3.91
Nitrite Plus Nitrate	Annual	mg/l	- - - -Monitor- - - -		60	12.5	24.7	0.85-30.2
Phosphorus	Annual	mg/l	1.0	1.5[a]	235	0.09	0.45	0-1.16
		kg/day	7.19	10.8	--	--	--	--
Cyanide, Free	Annual	mg/l	- - - -Monitor- - - -		3	0	0	0-0
Nickel	Annual	µg/l	- - - -Monitor- - - -		20	0	11.1	0-12
Zinc	Annual	µg/l	- - - -Monitor- - - -		20	32.5	82.1	11-197
Cadmium	Annual	µg/l	- - - -Monitor- - - -		53	0	0	0-0
Lead	Annual	µg/l	39	797	53	0	0	0-0
		kg/day	0.280	5.73	--	--	--	--
Chromium	Annual	µg/l	- - - -Monitor- - - -		20	0	0	0-0
Copper	Annual	µg/l	31	58	60	0	13	0-16
		kg/day	0.222	0.417	--	--	--	--
Hexavalent Chromium	Annual	µg/l	- - - -Monitor- - - -		20	0	0.205	0-4.1
E. coli	Annual	#/100 ml	161	362	358	1	187	0-15500
Flow Rate	Annual	MGD	- - - -Monitor- - - -		1826	0.624	1.74	0.116-7.9
Mercury	Annual	ng/l	8.4	1700	60	2.29	7.93	0-13.2
		kg/day	6.04E-05	0.0122	--	--	--	--
Acute Toxicity, *Ceriodaphnia dubia*	Annual	TU_a	- - - -Monitor- - - -		11	0	0	0-0
Chronic Toxicity, *Ceriodaphnia dubia*	Annual	TU_c	- - - -Monitor- - - -		10	0	1.31	0-1.4
Acute Toxicity, *Pimephales promelas*	Annual	TU_a	- - - -Monitor- - - -		11	0	0.1	0-0.2
Chronic Toxicity, *Pimephales promelas*	Annual	TU_c	- - - -Monitor- - - -		11	0	0	0-0
pH, Maximum	Annual	S.U.	9.0 Maximum		1826	7.5	7.9	6.3-8.9
pH, Minimum	Annual	S.U.	6.5 Minimum		1826	7.5	7.9	6.3-8.9
Total Filterable Residue	Annual	mg/l	- - - -Monitor- - - -		50	671	770	0-829
CBOD 5 day	Annual	mg/l	12.2	18.4[a]	716	0	0	0-12
		kg/day	87.7	132	--	--	--	--

Table 3. Effluent Characterization Using Self-Monitoring Data - continued

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Sludge Station 581								
Ammonia	Annual	mg/kg	- - - -Monitor- - - -		6	779	948	768-965
Total Kjeldahl Nitrogen	Annual	mg/kg	- - - -Monitor- - - -		6	28000	34000	22000-34200
Phosphorus	Annual	mg/kg	- - - -Monitor- - - -		6	29800	34200	21700-35300
Potassium	Annual	mg/kg	- - - -Monitor- - - -		6	1960	2500	1740-2600
Arsenic	Annual	mg/kg	--	75	6	6.11	8.77	0-9.03
Cadmium	Annual	mg/kg	--	85	6	4.33	5.12	2.41-5.23
Copper	Annual	mg/kg	--	4300	6	430	628	337-684
Lead In	Annual	mg/kg	--	840	6	18.5	61.3	10.1-74.9
Nickel	Annual	mg/kg	--	420	6	55.4	73.9	34.2-75.2
Zinc	Annual	mg/kg	--	7500	6	1000	1190	735-1240
Selenium	Annual	mg/kg	--	100	6	5.77	7.18	0-7.56
Sludge Fee Weight	Annual	dry tons	- - - -Monitor- - - -		6	77.2	132	0-133
Fecal Coliform	Annual	CFU/gram	--	2000000	6	0	394	0-499
Sludge Weight	Annual	Dry Tons	- - - -Monitor- - - -		7	110	150	19.2-157
Mercury	Annual	mg/kg	--	57	6	0.248	1.44	0-1.56
Molybdenum	Annual	mg/kg	--	75	6	19.2	27	17.3-29.2
Sludge Station 588								
Sludge Weight	Annual	Dry Tons	- - - -Monitor- - - -		3	133	155	110-157
Outfall 601								
Total Suspended Solids	Annual	mg/l	- - - -Monitor- - - -		719	85	230	0-560
Cyanide	Annual	mg/l	- - - -Monitor- - - -		3	0	0	0-0
Nickel	Annual	µg/l	- - - -Monitor- - - -		19	0	18.7	0-43
Zinc	Annual	µg/l	- - - -Monitor- - - -		19	81	133	33-147
Cadmium	Annual	µg/l	- - - -Monitor- - - -		53	0	0	0-5
Lead	Annual	µg/l	- - - -Monitor- - - -		53	0	0	0-13
Chromium	Annual	µg/l	- - - -Monitor- - - -		19	0	0	0-0
Copper	Annual	µg/l	- - - -Monitor- - - -		53	19	44	0-85
Hexavalent Chromium	Annual	µg/l	- - - -Monitor- - - -		20	0	10.9	0-28.9
Mercury	Annual	ng/l	- - - -Monitor- - - -		50	16.9	60.2	3.13-173
pH, Maximum	Annual	S.U.	- - - -Monitor- - - -		1826	7.5	8.5	6.5-9.1
pH, Minimum	Annual	S.U.	- - - -Monitor- - - -		1826	7.5	8.5	6.5-9.1
CBOD 5 day	Annual	mg/l	- - - -Monitor- - - -		712	77	180	0-470

Table 3. Effluent Characterization Using Self-Monitoring Data - continued

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Outfall 801								
Water Temperature	Annual	°C	- - - -Monitor- - - -		60	12	21	1-21
Dissolved Oxygen	Annual	mg/l	- - - -Monitor- - - -		60	9.4	12.8	6.8-14.1
pH	Annual	S.U.	- - - -Monitor- - - -		60	7.2	7.61	6.9-8
Ammonia	Annual	mg/l	- - - -Monitor- - - -		60	0	0.0135	0-1.29
Nitrite Plus Nitrate	Annual	mg/l	- - - -Monitor- - - -		50	1.36	6.02	0-10.5
Phosphorus	Annual	mg/l	- - - -Monitor- - - -		50	0.05	0.266	0-0.5
E. coli	Annual	#/100 ml	- - - -Monitor- - - -		33	580	2410	0-2420
48-Hr. Acute Toxicity, *Ceriodaphnia dubia*	Annual	% Affected	- - - -Monitor- - - -		11	0	10	0-20
96-Hr. Acute Toxicity, *Pimephales promela*	Annual	% Affected	- - - -Monitor- - - -		11	0	5	0-7.5
7-Day Chronic Toxicity, *Ceriodaphnia dubia*	Annual	% Affected	- - - -Monitor- - - -		11	0	15	0-20
7-Day Chronic Toxicity, *Pimephales promelas*	Annual	% Affected	- - - -Monitor- - - -		11	2.5	7.5	0-7.5
Outfall 901								
Water Temperature	Annual	°C	- - - -Monitor- - - -		60	12.5	21	2-22
Dissolved Oxygen	Annual	mg/l	- - - -Monitor- - - -		60	9.35	12.4	6.4-15.3
pH	Annual	S.U.	- - - -Monitor- - - -		60	7.3	7.7	6.9-8
Ammonia	Annual	mg/l	- - - -Monitor- - - -		60	0	0	0-4.75
Nitrite Plus Nitrate	Annual	mg/l	- - - -Monitor- - - -		50	2.84	11.6	0-18.6
Phosphorus	Annual	mg/l	- - - -Monitor- - - -		50	0.07	0.257	0-0.52
Cyanide	Annual	mg/l	- - - -Monitor- - - -		3	0	0.009	0-0.01
Hardness	Annual	mg/l	- - - -Monitor- - - -		53	340	544	14.6-570
Nickel	Annual	µg/l	- - - -Monitor- - - -		3	0	0	0-0
Zinc	Annual	µg/l	- - - -Monitor- - - -		3	0	11.7	0-13
Cadmium	Annual	µg/l	- - - -Monitor- - - -		53	0	1.2	0-13.3
Lead	Annual	µg/l	- - - -Monitor- - - -		53	0	0	0-13
Chromium	Annual	µg/l	- - - -Monitor- - - -		3	0	0	0-0
Copper	Annual	µg/l	- - - -Monitor- - - -		53	0	3.6	0-12.8
Hexavalent Chromium	Annual	µg/l	- - - -Monitor- - - -		3	0	0	0-0
E. coli	Annual	#/100 ml	- - - -Monitor- - - -		35	248	2410	5-2420

[a] = weekly average.

Table 4. Projected Effluent Quality for Outfall 001

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Aluminum	µg/l	2	2	1975.088	2705.6
Ammonia-Summer	mg/l	240	3	2.80028	3.836
Ammonia-Winter	mg/l	180	35	10.3368	14.16
Cadmium	µg/l	55	0	--	--
Chloroform (Trichloromethane)	µg/l	2	1	2.13598	2.926
Chromium	µg/l	22	0	--	--
Copper	µg/l	61	29	10.787	14.265
Cyanide - free	mg/l	5	0	--	--
Dissolved Solids (max)	mg/l	43	43	748.05	825.3
Hexavalent Chromium	µg/l	16	1	4.4895	6.15
Iron	µg/l	2	2	288.496	395.2
Lead	µg/l	55	0	--	--
Mercury	ng/l	60	59	5.5628	8.6076
Nickel	µg/l	22	5	9.355	14.637
Nitrate-N + Nitrite	mg/l	59	59	22.427	32.371
Strontium	µg/l	2	2	4605	6308
Zinc	µg/l	22	22	82.096	135.48

MDL = analytical method detection limit
PEQ = projected effluent quality

Table 5. Summary of Acute and Chronic Toxicity Results

	Ceriodaphnia Dubia		*Pimephales Promelas*	
Date	Tu_a	Tu_c	Tu_a	Tu_c
9/12/2011	AA	AA	AA	AA
11/14/2011	AA	1.2	AA	AA
2/10/2012	AA	AA	AA	AA
5/11/2012	AA	1.2	AA	AA
7/20/2012	AA	AA	AA	AA
11/6/2012	AA	AA	AA	AA
2/15/2013	AA	AA	AA	AA
5/10/2013	AA	AA	AA	AA
7/19/2013	AA	1.4	AA	AA
11/5/2013	AA	1.1	0.20	AA
2/10/2014	AA	AA	AA	AA

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

Table 6. Ohio EPA Toxicity Screening Results for Outfall 001

	Pimephales promelas %M		*Ceriodaphnia dubia* %M	
Date	24 hours	48 hours	24 hours	48 hours
10/06/2014	0	0	0	0
10/07/2014	0	0	0	0
10/06/2014-10/07/14[a]	0	0	0	0
11/03/2014	0	0	0	0
11/04/2014	0	5	0	5
11/03/14-11/04/14[a]	5	5	0	5

[a] = 24-hour composite sample
%M = percent mortality in 100% effluent

Table 7. Use Attainment Table

River Mile Invertebrate/Fish	Use	Attainment	Causes	Sources
1.2/1.2	WWH	Full	--	--
4.4/4.3	WWH	Partial	Nutrients, siltation, organic enrichment/DO, thermal modification	Crop production, municipal point sources, low head dam
7.4/7.6	WWH	Partial	Nutrients, organic enrichment/DO, bacteria (PCR)	Crop production
___/11.5	WWH	NON	Nutrients, siltation, organic enrichment/DO, bacteria (PCR)	crop production, CSO, urban runoff, municipal point sources
15.5/15.5	WWH	Partial	Organic enrichment/DO, thermal modification, nutrients, bacteria (PCR)	crop production, ground water loadings (low DO), CSO
19.5/19.4	WWH	NON	Direct habitat alteration, nutrients, siltation, organic enrichment/DO, bacteria (PCR)	Ag related channelization, crop production
22.0/22.6	WWH[a]	NON	Direct habitat alteration, nutrients, siltation, organic enrichment/DO	Ag related channelization, crop production
24.9/24.9	WWH[a]	NON	Direct habitat alteration, nutrients, siltation, organic enrichment/DO, bacteria (PCR)	Ag related channelization, crop production

WWH = warmwater habitat

a = Recommended use Modified Warmwater Habitat (MWH)

Table 8. Water Quality Criteria in the Study Area

		Outside Mixing Zone Criteria					Inside Mixing Zone
			Average			Maximum	
Parameter	Units	Wildlife	Human Health	Agri-culture	Aquatic Life	Aquatic Life	Maximum
Aluminum	µg/l	--	4500	--	--	--	--
Ammonia-Summer	mg/l	--	--	--	2.1	--	--
Ammonia-Winter	mg/l	--	--	--	7.6	--	--
Cadmium - TR	µg/l	--	730	50	6.4	18	36
Chloroform	µg/l	--	1700c	--	140	1300	2600
Chromium	µg/l	--	14000	100	230	4900	9800
Copper	µg/l	--	64000	500	27	44	89
Cyanide - free	mg/l	--	48	--	0.0052	0.022	0.044
Hexavalent Chromium	µg/l	--	14000	--	11	16	31
Iron	µg/l	--	--	5000	--	--	--
Lead	µg/l	--	--	100	30	580	1200
Mercury	ng/l	1.3	3.1	10000	910	1700	3400
Nickel	µg/l	--	43000	200	150	1300	2600
Nitrate + Nitrite	mg/l	--	--	100	--	--	--
Strontium	µg/l	--	1400000	--	21000	40000	81000
Total Filterable Residue	mg/l	--	--	--	1500	--	--
Zinc	µg/l	--	35000	25000	340	340	680

Table 9. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Stream Flows				
1Q10	cfs	annual	0.27	USGS (Stream Gauge 04189000) Drainage Area Ratio Calculation
7Q10	cfs	annual summer winter	0.35 0 0	USGS (Stream Gauge 04189000) Drainage Area Ratio Calculation
30Q10	cfs	summer winter	0.5 1.41	USGS (Stream Gauge 04189000) Drainage Area Ratio Calculation
90Q10	cfs	annual	0.8	USGS (Stream Gauge 04189000) Drainage Area Ratio Calculation
Harmonic Mean	cfs	annual	2.97	USGS (Stream Gauge 04189000) Drainage Area Ratio Calculation
Mixing Assumption	% %	average maximum	25 100	
Hardness	mg/l	annual	340	DMR; Station 901, 2011-2015, n=53
pH	S.U.	summer winter	7.3 7.475	DMR; Station 901 2011-2015, n=20 DMR; Station 901, 2011-2015, n=14
Temperature	°C	summer winter	21 7	DMR; Station 901 2011-2015, n=20 DMR; Station 901, 2011-2015, n=14
Bluffton WWTP Flow	cfs	annual	2.94	Permit Application Design Flow
Background Water Quality				
Aluminum	µg/l		218.9	STORET; 2005-10; n=8; 3<MDL; Station P05S57
Ammonia-Summer	mg/l		0.0135	DMR; 2011-2015; n=20; 19<MDL; Station 801
Ammonia-Winter	mg/l		0	DMR; 2011-2015; n=14; 14<MDL; Station 801
Cadmium - TR	µg/l		0.15	STORET; 2005-10; n=8; 7<MDL; Station P05S57
Chloroform	µg/l			No representative data available.
Chromium	µg/l		0	STORET; 2005-10; n=8; 8<MDL; Station P05S57
Copper	µg/l		0	STORET; 2005-10; n=8; 8<MDL; Station P05S57
Cyanide - free	mg/l			No representative data available.
Dissolved Solids	mg/l		747	STORET; 2005-10; n=8; 0<MDL; Station P05S57
Hexavalent Chromium	µg/l			No representative data available.
Iron	µg/l		424	STORET; 2005-10; n=8; 0<MDL; Station P05S57
Lead	µg/l		0	STORET; 2005-10; n=8; 8<MDL; Station P05S57
Mercury	ng/l			No representative data available.
Nickel	µg/l		0	STORET; 2005-10; n=8; 8<MDL; Station P05S57
Nitrate + Nitrite	mg/l		0.64	STORET; 2005-10; n=8; 1<MDL; Station P05S57
Strontium	µg/l		3492	STORET; 2005-10; n=8; 0<MDL; Station P05S57
Zinc	µg/l		7.5	STORET; 2005-10; n=8; 6<MDL; Station P05S57

MDL = analytical method detection limit
n = number of samples
NPDES = National Pollutant Discharge Elimination System
Ohio EPA = Ohio Environmental Protection Agency
WWTP = wastewater treatment plant

Table 10. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

		Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Average				Maximum	
Parameter	Units	Wildlife	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Aluminum	µg/l	--	5581	--	--	--	--
Ammonia-Summer	mg/l	--	--	--	--	--	--
Ammonia-Winter	mg/l	--	--	--	--	--	--
Cadmium	µg/l	--	914	63	6.6	20	36
Chloroform	µg/l	--	2129	--	144	1419	2600
Chromium	µg/l	--	17536	125	237	5350	9800
Copper	µg/l	--	80163	626	28	48	89
Cyanide - free	mg/l	--	60	--	0.0054	0.024	0.044
Hexavalent Chromium	µg/l	--	17536	--	11	17	31
Lead	µg/l	--	--	125	31	633	1200
Mercury	ng/l	1.3	3.1	10000	910	1700	3400
Nickel	µg/l	--	53860	251	154	1419	2600
Nitrate + Nitrite	mg/l	--	--	125	--	--	--
Strontium	µg/l	--	1752690	--	21521	43353	81000
Total Filterable Residue	mg/l	--	--	--	1522	--	--
Zinc	µg/l	--	43837	31312	350	371	680

Table 11. Parameter Assessment

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

No parameters meet this criterion

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

Cadmium	Chloroform	Chromium
Lead	Nickel	Iron
Nitrate + Nitrite	Strontium	Cyanide - free

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

Aluminum	Hexavalent Chromium	Copper - TR
Zinc - TR	Total Filterable Residue	

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

No parameters meet this criterion

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

Limits to Protect Numeric Water Quality Criteria

			Recommended Effluent Limits	
Parameter	Units	Period	Average	Maximum
Mercury	ng/l		1.3	1700

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

Table 12. Final Effluent Limits for Outfall 001

		Concentration		Loading (kg/day)[a]		
		30 Day	Daily	30 Day	Daily	
Parameter	Units	Average	Maximum	Average	Maximum	Basis[b]
Water Temperature	°C	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]
Flow Rate	MGD	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]
pH	SU	6.5 - 9.0		--	--	WQS
Dissolved Oxygen	mg/l	5.6 minimum		--	--	PD
Total Suspended Solids	mg/l	15.6	23.4[d]	112	168[d]	PD
Oil & Grease	mg/l	--	10.0	--	--	WQS
Ammonia						
Summer	mg/l	1.4	2.1[d]	10.1	15.1[d]	PD
Winter	mg/l	7.9	11.9[d]	56.8	85.6[d]	PD
Total Kjeldahl Nitrogen	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]
Nitrate+Nitrite	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]
Phosphorus	mg/l	1.0	1.5[d]	7.2	10.8[d]	PTS
Dissolved orthophosphate	mg/L	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		SB1
Total Filterable Residue	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]/BTJ
Nickel	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]/BTJ
Zinc	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]/BTJ
Cadmium	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]/BTJ
Lead	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]/BTJ
Chromium	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]/BTJ
Copper	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]/BTJ
Hexavalent Chromium (Dissolved)	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]/BTJ
Mercury	ng/l	5.6	1700	0.000041	0.0122	VAR(avg), WLA (max)
E. coli	#/100 ml	126	284[d]	--	--	WQS
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/l	12.2	18.4[d]	87.7	132[d]	PD
Acute Toxicity						
Ceriodaphnia dubia	TU_a	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		WET(1)
Pimephales promelas	TU_a	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		WET(1)
Chronic Toxicity Initial/Interim						
Ceriodaphnia dubia	TU_c	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		WET(1)
Pimephales promelas	TU_c	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		WET(1)
Chronic Toxicity Final						
Ceriodaphnia dubia	TU_c	1.0	1.6	--	--	WET(2)
Pimephales promelas	TU_c	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		WET(1)

[a] Effluent loadings based on average design discharge flow of 1.9 MGD.

[b] Definitions:

BTJ = Best Technical Judgment
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
NPDES = National Pollutant Discharge Elimination System
OAC = Ohio Administrative Code
PD = Plant Design (OAC 3745-33-05(E))
PTS = Phosphorus Treatment Standards (OAC 3745-33-06 (C))
SB1 = Implementation of Senate Bill 1 [ORC 6111.03];
VAR = Mercury variance (OAC 3745-33-07(D)(10)(a))
WET(1) = Whole effluent toxicity minimum requirements (OAC 3745-33-07(B))
WET(2) = Whole effluent toxicity required under [40 CFR Part 132, Appendix F, Procedure 6]
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.

Addendum 1. Acronyms

ABS	Anti-backsliding
BPJ	Best professional judgment
CFR	Code of Federal Regulations
CMOM	Capacity Management, Operation, and Maintenance
CONSWLA	Conservative substance wasteload allocation
CSO	Combined sewer overflow
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DMT	Dissolved metal translator
IMZM	Inside mixing zone maximum
LTCP	Long-term Control Plan
MDL	Analytical method detection limit
MGD	Million gallons per day
NPDES	National Pollutant Discharge Elimination System
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
ORSANCO	Ohio River Valley Water Sanitation Commission
PEL	Preliminary effluent limit
PEQ	Projected effluent quality
PMP	Pollution Minimization Program
PPE	Plant performance evaluation
SSO	Sanitary sewer overflow
TMDL	Total Daily Maximum Load
TRE	Toxicity reduction evaluation
TU	Toxicity unit
U.S. EPA	United States Environmental Protection Agency
WET	Whole effluent toxicity
WLA	Wasteload allocation
WPCF	Water Pollution Control Facility
WQBEL	Water-quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater Treatment Plant