

National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for Grafton WWTP

Public Notice No.: 15-11-071
Public Notice Date: November 30, 2015
Comment Period Ends: December 30, 2015

Ohio EPA Permit No.: 3PB00024*JD
Application No.: OH0025372

Name and Address of Applicant:

**Village of Grafton
960 Main Street
Grafton, Ohio 44044**

Name and Address of Facility Where

Discharge Occurs:

**Village of Grafton WWTP
1013 McAlpin Court
Grafton, Ohio 44044
Lorain County**

Receiving Water: The East Branch of the Black River

Subsequent Stream Network: 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 previous permit, although some monitoring frequencies have changed: water temperature, dissolved oxygen, total suspended solids, oil and grease, winter ammonia, nitrite plus nitrate, TKN, phosphorus, nickel, zinc, cadmium, lead, chromium, copper, dissolved hexavalent chromium, E. coli, flow rate, pH, total filterable residue and CBOD₅.

Lower effluent limits are proposed for summer ammonia because the data show the reasonable potential to violate WQS.

Lower water quality based effluent limits are proposed for mercury. Grafton submitted a mercury variance application request with the NPDES permit application. The variance was not granted. Grafton has been unable to document that the city has been fully implementing their mercury PMP. Although the variance application states that mercury data show a downward trend; the data actually shows an increase in the average mercury concentration every year since 2011. The application also states that Grafton will continue to implement the existing pollutant minimization plan. However, the existing plan is not successful in lowering the mercury concentration in the effluent, as seen by the increasing trend.

A 48 month compliance schedule has been included in the draft permit, requiring the permittee to submit and implement a PMP to enable the POTW to meet final mercury limits.

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

Free cyanide and metals monitoring are being removed from downstream monitoring station 901.

This permit no longer authorizes the use of method 4500 CN-I from Standard Methods for free cyanide testing. As soon as possible, the permittee must begin using either ASTM D7237-10 or OIA-1677-09 both of which are approved methods for free cyanide listed in 40 CFR 136.

To ensure that data is obtained that allows Ohio EPA to make water quality-related decisions regarding cadmium and lead; a special condition is proposed in Part II of the permit that provides guidance on the analytical method detection limits (MDLs) the permittee should use in analyzing for these contaminants.

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; phosphorus optimization; and outfall signage.

Table of Contents

Introduction.....	1
Summary of Permit Conditions	2
Table of Contents.....	4
Procedures for Participation in the Formulation of Final Determinations.....	5
Information Regarding Certain Water Quality Based Effluent Limits	5
Location of Discharge/Receiving Water Use Classification.....	6
Facility Description.....	7
Description of Existing Discharge	7
Assessment of Impact on Receiving Waters.....	8
Development of Water Quality Based Effluent Limits	9
Reasonable Potential / Effluent Limits / Hazard Management Decisions	11
Other Requirements	12

List of Figures

Figure 1. Location of Grafton WWTP.....	14
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List of Tables

Table 1. Summary of Annual Effluent Flow Rate	15
Table 2. Effluent Characterization Using Self-Monitoring Data	16
Table 3. Summary of Toxicity Test Results Reported by Grafton WWTP	18
Table 4. Water Quality Criteria in the Study Area.....	19
Table 5. Instream Conditions and Discharger Flow.....	20
Table 6. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria	22
Table 7. Parameter Assessment	23
Table 8. Final Effluent Limits and Monitoring Requirements.....	24

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 Ashley Ward at (614) 644-4852 or ashley.ward@epa.ohio.gov.

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 Village of Grafton WWTP discharges to The East Branch of The Black River at River Mile 11.2. Figure 1 shows the approximate location of the facility.

This segment of the The East Branch of The Black River is described by Ohio EPA River Code: 20-010, U.S. EPA River Reach Code: 04110001-006, County: Lorain, Ecoregion: Erie/Ontario Lake Plain. The East Branch of The Black River is designated for the following uses under Ohio's WQS (OAC 3745-1-27): Warmwater Habitat, Agricultural Water Supply, Industrial Water Supply, and Class A 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 Village of Grafton WWTP was constructed in 1930 and last upgraded in 2001. The average design flow is 1.5 million gallons per day (MGD). The WWTP has the following treatment processes:

- Flow equalization
- Fine screening
- Influent pumping
- Sequencing batch reactor
- Tertiary filtration
- UV disinfection

The Village of Grafton has 100% separated sewers in the collection system. The Village of Grafton does not have an approved pretreatment program. The Village of Grafton has 3 categorical users that discharge 0.20 MGD of flow and 2 significant non-categorical users that discharge 0.20 MGD of flow.

The Village of Grafton WWTP utilizes the following sewage sludge treatment processes:

- Aerobic digestion
- Dewatering using belt filter press

Treated sludge is hauled away for final disposal at a municipal solid waste landfill.

Description of Existing Discharge

The Village of Grafton's collection system has an estimated infiltration/inflow (I/I) rate of 0.32 MGD that may contribute to SSOs. The median annual effluent flow rate for The Village of Grafton WWTP for the previous five years is presented on Table 1.

The Village of Grafton does not have any known dedicated SSO structures in its collection system. Rather, SSO events occur when sanitary sewers become surcharged and releases occur through pipe breaks, surcharged manholes, etc. The Village of Grafton reports SSOs at station 300. From February 2010 through January 2015, the Village of Grafton reported 11 SSOs. The Village of Grafton completed

construction of a 5 million gallon flow equalization basin at its WWTP in the spring of 2015. The flow equalization basin was installed to: 1) store excessive flows that occur at the WWTP during wet weather, 2) allow the WWTP to minimize upsets due to wet weather hydraulic overload events, and 3) reduce/eliminate the occurrences of SSOs in the collection system. In addition, The Village of Grafton has increased storm water pumping and installed fine screening at the WWTP.

Table 2 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 001. Data are presented for the period February 2010 through January 2015, and current permit limits are provided for comparison.

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

Assessment of Impact on Receiving Waters

The East Branch of the Black River has been identified as a priority impaired water on Ohio's 303(d) list.

The attainment status of The East Branch of The Black River is reported in the final *Ohio 2014 Integrated Water Quality Monitoring and Assessment Report*. 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 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 most recent data available for The East Branch of The Black River is from 2012. The East Branch of The Black River is in full attainment at the sampling locations both immediately upstream and downstream of Grafton WWTP. For more information, please see the *Ohio 2014 Integrated Water Quality Monitoring and Assessment Report* found at: <http://www.epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.aspx#123143421-2014>.

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

Self-monitoring data (DMR)

February 2010 through January 2015

Outliers

The data were examined and the following value was removed from the evaluation to give a more reliable PEQ: ammonia 5.28 mg/L, 7/7/14.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points (see Table 2).

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required. See Table 4 for a summary of the screening results.

Wasteload Allocation

For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. For free flowing streams, 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 5, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

Ohio’s WQS implementation rules [OAC 3745-2-05(A)(2)(d)(iv)] required a phase out of mixing zones for bioaccumulative chemicals of concern (BCCs) as of November 15, 2010. This rule applied statewide. Mercury is a BCC. The mixing zone phase-out means that as of November 15, 2010 all dischargers requiring mercury limits in their NPDES permit must meet WQS at the end-of-pipe, which for mercury are 1.3 ng/L (average) and 1700 ng/L (maximum) in the Lake Erie basin.

The data used in the WLA are listed in Table 4 and Table 5. The WLA results to maintain all applicable criteria are presented in Table 6.

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.

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 Grafton WWTP, the WLA values are 0.3 TU_a and 1.0 TU_c.

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

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

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 (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 WLA is less than 1.0 TU_a, it may be defined as:

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

The acute WLA for The Village of Grafton WWTP is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1 to 1.

Reasonable Potential/ Effluent Limits/Hazard Management Decisions

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 6. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 2, 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 7.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 8 presents the final effluent limits and monitoring requirements proposed for Grafton WWTP outfall 001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Temperature and flow rate

Monitoring for these parameters is proposed to continue in order to evaluate the performance of the treatment plant.

Total suspended solids, dissolved oxygen, winter ammonia and 5-day carbonaceous oxygen demand

The limits recommended for total suspended solids, dissolved oxygen, winter ammonia, and 5-day carbonaceous oxygen demand are technology-based treatment standards which can be found in OAC rule 3745-1-05.

Oil and grease, pH and E. coli

Limits proposed for oil and grease, pH, and *Escherichia coli* are based on WQS (OAC 3745-1-07). Class A PCR *E. coli* standards apply to the East Branch of the Black River.

Summer ammonia and mercury

The Ohio EPA risk assessment (Table 7) places summer ammonia and mercury in group 5. This placement, as well as the data in Table 2, indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For these parameters, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1).

Nitrite plus nitrate, nickel, zinc, cadmium, lead, chromium, copper, dissolved hexavalent chromium and free cyanide

The Ohio EPA risk assessment (Table 7) places nitrite plus nitrate, nickel, zinc, cadmium, lead, chromium, copper, dissolved hexavalent chromium and free cyanide in groups 2 and 3. This placement, as well as the data in Table 2, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at a low frequency is proposed to document that these pollutants continue to remain at low levels.

Total filterable residue

Based on best technical judgment, monitoring is proposed for total filterable residue (total dissolved solids).

Phosphorus

Limits proposed for phosphorus are based on Phosphorus Treatment Standards (OAC 3745-33-06 (C)).

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.

Whole Effluent Toxicity Reasonable Potential

After evaluating the acute and chronic toxicity results in Table 3 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, it was determined that reasonable potential for toxicity is not demonstrated. All reported values were below detection. While this indicates that the plant's effluent does not currently pose a toxicity problem, annual toxicity testing is proposed consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Additional Monitoring Requirements

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: removal to sanitary landfill.

Other Requirements

Phosphorus Optimization

The permittee shall prepare and submit a Phosphorus Discharge Optimization Evaluation plan to Ohio EPA Northeast 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 II.X 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 Certification and Operator of Record

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

Previously, The Village of Grafton WWTP was classified as a Class II facility. Per OAC 3745-7-04 (B)(2)(b) the facility is reclassified as a Class III facility due to ammonia limits being decreased.

Low-Level Free Cyanide Testing

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

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

These methods will allow Ohio EPA to make more reliable water quality-related decisions regarding free cyanide. Because the quantification levels are lower than any water quality-based effluent limits, it will also be possible to directly evaluate compliance with free cyanide limits.

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

Method Detection Limit

The reported data for cadmium shows that The Village of Grafton WWTP used an analytical method with a MDL that is not sensitive enough to properly evaluate the discharge with regard to the WLA for this parameter. As a result, Part II of the permit includes a condition requiring the The Village of Grafton WWTP to use an analytical method with an appropriate MDL.

Storm Water Compliance

Parts IV, V, and VI remain in the draft permit to ensure that any storm water flows from the facility site are properly regulated and managed.

Outfall Signage

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

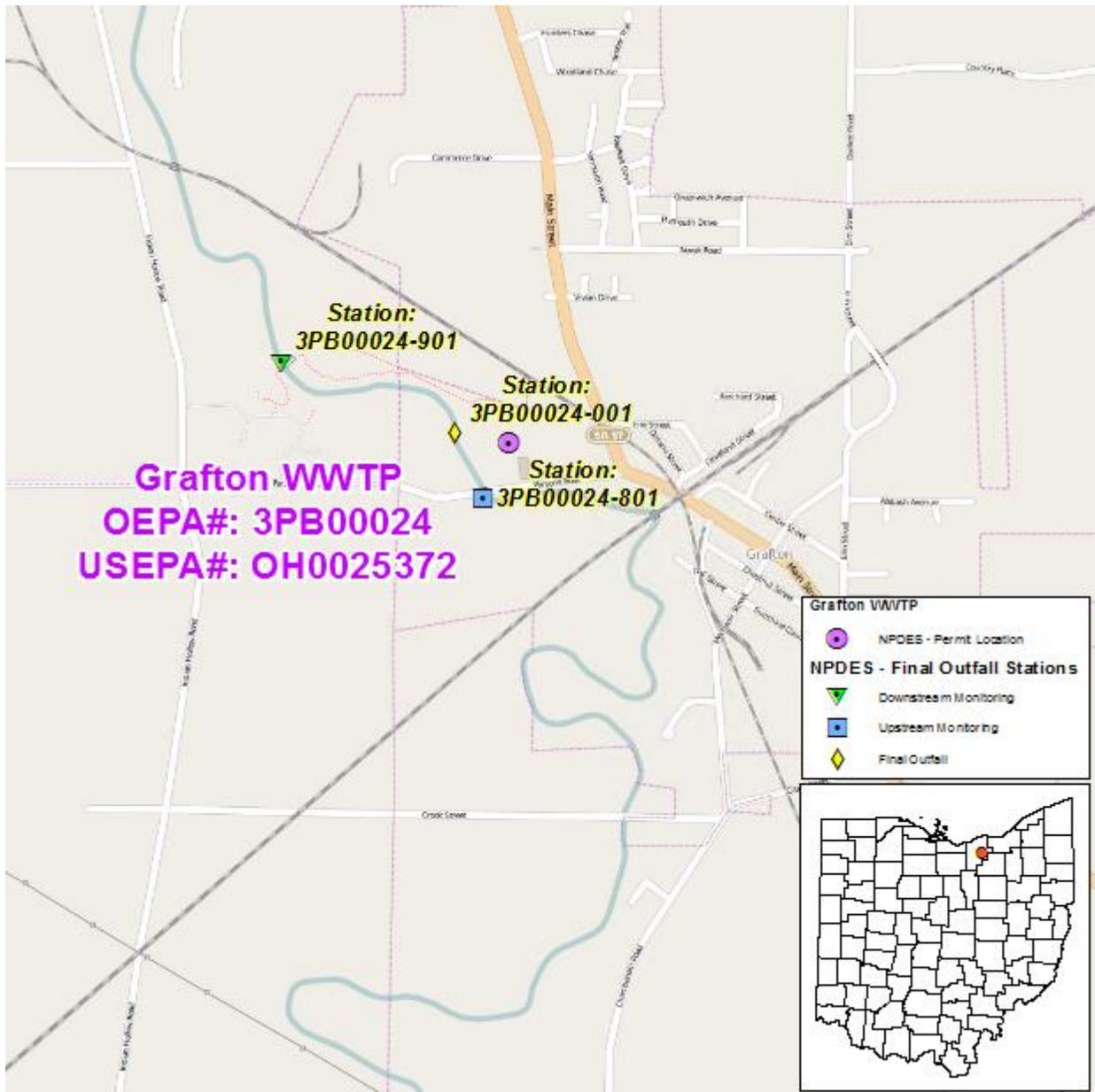


Figure 1. Location of Grafton WWTP.

Table 1. Average Annual Effluent Flow Rates.

Year	Annual Flow in MGD		
	50th Percentile	95th Percentile	Maximum
2011	0.96	2.1	3.4
2012	0.87	1.7	4.4
2013	0.90	1.7	3.6
2014	1.0	1.9	3.3

MGD = million gallons per day

Table 2. Effluent Characterization Using Self-Monitoring Data.

Parameter	Season	Units	Current Permit Limits		Percentiles		Data Range	Decision Criteria		
			30 day	Daily	50 th	95 th		# Obs.	PEQ _{ave}	PEQ _{max}
Water Temperature	Annual	°C	Monitor		17.5	25	8.5-27.2			
Dissolved Oxygen	Summer	mg/L	6.0 Min		7.59	8.34	6.21-21.2	425	7.689	8.5327
Dissolved Oxygen	Winter	mg/L	6.0 Min		8.54	9.49	6.05-10.9	313	8.9385	9.695
Total Suspended Solids	Annual	mg/L	12	18 ^a	1.1	4.41	0.2-111	720	2.1651	4.0798
Oil and Grease	Annual	mg/L	10 Max		0	4	0-9	93	3.5725	5.461
Nitrogen, Ammonia	Summer	mg/L	1.0	1.5 ^a	0	0.25	0-5.28	239	0.4855	0.665
Nitrogen, Ammonia	Winter	mg/L	3.0	4.5 ^a	0	0.256	0-3.55	180	2.07	2.836
Nitrogen Kjeldahl, Total	Annual	mg/L	Monitor		0.755	1.41	0.36-1.93	20	1.2716	1.8286
Nitrite Plus Nitrate, Total	Annual	mg/L	Monitor		5.6	8.82	2.7-12.9	20	8.7683	11.984
Phosphorus, Total	Annual	mg/L	1.0	1.5 ^a	0.08	0.41	0-0.86	279	0.33503	0.51698
Cyanide, Free	Annual	mg/L	Monitor		0	0	0-0	20	--	--
Nickel	Annual	µg/L	Monitor		0	0	0-0	31	--	--
Zinc	Annual	µg/L	Monitor		25	43.8	0-59	20	49.018	78.631
Cadmium	Annual	µg/L	Monitor		0	0	0-0	31	--	--
Lead	Annual	µg/L	Monitor		0	0	0-0	31	--	--
Chromium	Annual	µg/L	Monitor		0	0	0-0	20	--	--
Copper	Annual	µg/L	Monitor		0	0	0-0	31	--	--
Chromium, Dissolved Hexavalent	Annual	µg/L #/100	Monitor		0	0	0-0	20	--	--
Fecal Coliform	Annual	ml #/100	1000	2000 ^a	1	62.6	1-3080			
E. coli	Annual	ml	126	284 ^a	1	17.9	1-595			
Flow Rate	Annual	MGD	Monitor		0.926	1.8	0.526-4.43			
Mercury	Annual	ng/L	2.7	1700	1.8	6.05	0-8.15	43	6.0824	9.8863
Acute Toxicity, <i>Ceriodaphnia dubia</i>	Annual	TU _a	Monitor		0	0	0-0			

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

Parameter	Season	Units	Current Permit Limits		Percentiles		Data Range	Decision Criteria		
			30 day	Daily	50 th	95 th		# Obs.	PEQ _{ave}	PEQ _{max}
Chronic Toxicity, <i>Ceriodaphnia dubia</i>	Annual	TU _c	Monitor		0	0	0-0			
Acute Toxicity, <i>Pimephales promelas</i>	Annual	TU _a	Monitor		0	0	0-0			
Chronic Toxicity, <i>Pimephales promelas</i>	Annual	TU _c	Monitor		0	0	0-0			
pH, Maximum	Annual	S.U.		9 Max	7.53	7.67	7.01-7.8			
pH, Minimum	Annual	S.U.	6.5 Min		7.3	7.5	6.73-7.63			
Residue, Total Filterable	Annual	mg/L	Monitor		488	620	338-626	13	596.27	721.55
CBOD 5 day	Summer	mg/L	10	15 ^a	0	4	0-9	240	2.4645	4.6225
CBOD 5 day	Winter	mg/L	10	15 ^a	0	4	0-8	181	2.4273	4.783

All values are based on annual records unless otherwise indicated. * = For minimum pH, 5th percentile shown in place of 50th percentile; ** = For dissolved oxygen, 5th percentile shown in place of 95th percentile; a = weekly average.

Table 3. Summary of Acute and Chronic Toxicity Results.

Date	<i>Ceriodaphnia Dubia</i>		<i>Pimephales promelas</i>	
	TU_a	TU_c	TU_a	TU_c
9/20/2011	AA	AA	AA	AA
9/21/2012	AA	AA	AA	AA
9/13/2013	AA	AA	AA	AA
9/23/2014	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 4. Water Quality Criteria in the Study Area.

Parameter	Units	Outside Mixing Zone Criteria				Maximum Aquatic Life	Inside Mixing Zone Maximum
		Wildlife	Average				
			Human Health	Agri-culture	Aquatic Life		
Ammonia, Summer	mg/L	--	--	--	0.9	--	--
Ammonia, Winter	mg/L	--	--	--	4.4	--	--
Cadmium	µg/L	--	730	50	4.3	10	20
Chromium	µg/L	--	14000	100	150	3200	6400
Chromium VI - Diss	µg/L	--	14000	--	11	16	31
Copper	µg/L	--	64000	500	17	27	54
Cyanide - free	mg/L	--	48	--	0.0052	0.022	0.044
Total Filterable Residue	mg/L	--	--	--	1500	--	--
Lead	µg/L	--	--	100	16	300	600
Mercury	ng/L	1.3	3.1	10000	910	1700	3400
Nickel	µg/L	--	43000	200	95	850	1700
Nitrate-N + Nitrite-N	mg/L	--	--	100	--	--	--
Zinc	µg/L	--	35000	25000	220	220	430

Table 5. Instream Conditions and Discharger Flow.

<u>Parameter</u>	<u>Units</u>	<u>Season</u>	<u>Value</u>	<u>Basis</u>
<i>Stream Flows</i>				
1Q10	cfs	annual	0	USGS gage 04200000
7Q10	cfs	annual	0	USGS gage 04200000
		summer	0	USGS gage 04200000
		winter	2.31	USGS gage 04200000
30Q10	cfs	summer	0.0825	USGS gage 04200000
		winter	5.86	USGS gage 04200000
90Q10	cfs	annual	0.413	
Harmonic Mean	cfs	annual	1.98	USGS gage 04200000
Mixing Assumption	%	average	25	
	%	maximum	100	
<i>Hardness</i>	mg/L	annual	202	Station 901, 50th percentile N = 60
<i>pH</i>	S.U.	summer	8.12	Station 901, N = 20
		winter	7.85	Station 901, N = 15
<i>Temperature</i>	°C	summer	22.83	Station 901, N = 20
		winter	3.1	Station 901, N = 11
<i>Grafton WWTP flow</i>	cfs	annual	2.32	Renewal Application

<u>Parameter</u>	<u>Units</u>	<u>Season</u>	<u>Value</u>	<u>Basis</u>
<i>Background Water Quality</i>				
Ammonia, Summer	mg/L		0	801; 2010-15; N=20; 14<MDL;
Ammonia, Winter	mg/L		0	801; 2010-15; N=15; 9<MDL;
Cadmium	µg/L		0	OEPA; 2012; N=3; 3<MDL; Station B01S31
Chromium Dissolved Hexavalent	µg/L		0	OEPA; 2012; N=3; 3<MDL; Station B01S31
Chromium	µg/L		0	No representative data available.
Copper	µg/L		3	OEPA; 2012; N=3; 0<MDL; Station B01S31 Mean value
Cyanide - free	mg/L		0	No representative data available.
Total Filterable Residue	mg/L		403	OEPA; 2012; N=3; 0<MDL; Station B01S31 Mean value
Lead	µg/L		0	OEPA; 2012; N=3; 3<MDL; Station B01S31
Mercury	ng/L		0	No representative data available
Nickel	µg/L		4.4	OEPA; 2012; N=3; 0<MDL; Station B01S31 Mean value
Nitrate-N + Nitrite-N	mg/L		2.5	801; 2010-15; n=60; 60<MDL;
Zinc	µg/L		0	No representative data available.

MDL = analytical method detection limit

Ohio EPA = Ohio Environmental Protection Agency

N = Number of samples

USGS = United States Geological Survey

Table 6. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria.

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Wildlife	Average			Maximum	
			Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Ammonia, Summer	mg/L	--	--	--	0.93	--	--
Ammonia, Winter	mg/L	--	--	--	15.5	--	--
Cadmium	µg/L	--	886	61	4.3	10	20
Chromium	µg/L	--	16987	121	150	3200	6400
Dissolved Hexavalent Chromium	µg/L	--	16987	--	11	16	31
Copper	µg/L	--	77655	606	17	27	54
Cyanide - free	mg/L	--	58	--	0.0052	0.022	0.044
Total Filterable Residue	mg/L	--	--	--	1500	--	--
Lead	µg/L	--	--	121	16	300	600
Mercury	ng/L	1.3	3.1	10000	910	1700	3400
Nickel	µg/L	--	52174	242	95	850	1700
Nitrate-N + Nitrite-N	mg/L	--	--	121	--	--	--
Zinc	µg/L	--	42468	30334	220	220	430

Table 7. Parameter Assessment

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

No Group 1 parameters.

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

Cadmium	Chromium	Dissolved Hexavalent Chromium
Copper	Cyanide - free	Lead
Nickel	Nitrate + nitrite	

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

Total Filterable Residue	Zinc
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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 Group 4 parameters.

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

<u>Parameter</u>	<u>Units</u>	<u>Recommended Effluent Limits</u>	
		<u>Average</u>	<u>Maximum</u>
Ammonia, Summer	mg/L	0.93	--
Mercury	ng/L	1.3	1700

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

Table 8. Final Effluent Limits and Monitoring Requirements for Grafton WWTP Outfall 3PB00024001 and the Basis for Their Recommendation.

Parameter	Units	Effluent Limits				Basis
		Concentration		Loading (kg/day)		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Temperature	°C	Monitor		--	--	M
Dissolved Oxygen	mg/L		6.0 Min	--	--	BADCT
pH	S.U.	6.5 Min	9.0 Max	--	--	WQS
Total Suspended Solids	mg/L	12	18 ^c	68.2	102.3 ^c	BADCT
Oil and Grease	mg/L	--	10	--	--	WQS
Ammonia, Summer	mg/L	0.93	1.4 ^c	5.29	7.95 ^c	WLA
Ammonia, Winter	mg/L	3.0	4.5 ^c	17.1	25.6 ^c	BADCT
Nitrite + Nitrate	mg/L	Monitor		--	--	M
TKN	mg/L	Monitor				M
Ortho-phosphate	mg/L	Monitor				SB1
Phosphorus	mg/L	1.0	1.5 ^c	5.68	8.52 ^c	PTS
Nickel	µg/L	Monitor		--	--	M
Zinc	µg/L	Monitor		--	--	M
Cadmium	µg/L	Monitor		--	--	M
Lead	µg/L	Monitor		--	--	M
Chromium	µg/L	Monitor		--	--	M
Copper	µg/L	Monitor		--	--	M
Dissolved Hexavalent Chromium	µg/L	Monitor		--	--	M
E. coli	#/100 mL	126	284 ^c	--	--	WSQ
Flow Rate	MGD	Monitor		--	--	M
Mercury	ng/L	1.3	1700	0.000008	0.00966	VAR
Cyanide, Free	µg/L	Monitor		--	--	M
Acute Toxicity, Ceriodaphnia dubia	TU _a	Monitor		--	--	WET
Chronic Toxicity, Ceriodaphnia dubia	TU _c	Monitor		--	--	WET
Acute Toxicity, Pimephales promelas	TU _a	Monitor		--	--	WET
Chronic Toxicity, Pimephales promelas	TU _c	Monitor		--	--	WET
Total Filterable Residue	mg/L	Monitor		--	--	M

Table 8. Final Effluent Limits and Monitoring Requirements for Grafton WWTP Outfall 3PB00024001 and the Basis for Their Recommendation.

Parameter	Units	Effluent Limits				Basis
		Concentration		Loading (kg/day)		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Carbonaceous Oxygen Demand, 5 day	mg/L	10	15 ^c	56.8	85.2 ^c	BADCT

^a Effluent loadings based on average design discharge flow of 1.5 MGD.

^b Definitions: BADCT = Best Available Demonstrated Control Technology, 40 CFR Part 122.29
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
PTS = Phosphorus Treatment Standards (OAC 3745-33-06 (C))
SBI = Implementation of Senate Bill 1 [ORC 6111.03]
VAR = Mercury variance (OAC 3745-33-07(D)(10)(a))
WET = Whole Effluent Toxicity (OAC 3745-33-07(B))
WLA = Wasteload Allocation procedures (OAC 3745-2)
WQS = Ohio Water Quality Standards (OAC 3745-1)

^c 7 day average limit.