

National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

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

Public Notice No.: 14-02-027
Public Notice Date: February 17, 2014
Comment Period Ends: March 18, 2014

OEPA Permit No.: 2PD00006*SD
Application No.: OH0027910

Name and Address of Applicant:

City of Van Wert
515 North Main Street
Van Wert, Ohio 45891

Name and Address of Facility Where
Discharge Occurs:

Van Wert Wastewater Treatment Plant (WWTP)
7998 State Route 127 North
Van Wert, Ohio 45891

Receiving Water: Town Creek

Subsequent
Stream Network: Middle Creek, Little Auglaize River,
Auglaize River, Maumee River,
Maumee Bay, 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 and Ohio Water Pollution Control Law (Ohio Revised Code [ORC] 6111). Decisions to award variances to Water Quality Standards or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the Clean Water Act. Many of these have already been established by the United States Environmental Protection Agency (USEPA) 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 (WLA) allocations are used to develop these limits based on the pollutants that have been detected in the discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water

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

The need for water-quality-based limits is determined by comparing the wasteload allocation for a pollutant to a measure of the effluent quality. The measure of effluent quality is called 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 limits and monitoring frequencies have remained the same for the facility in this permit renewal except that monitoring has been added for total filterable residue, selenium, and bis(2-ethylhexyl)phthalate based on the WLA. Limits for lead and silver are being removed based on the WLA.

Final effluent limits are proposed for *Escherichia coli*. New water quality standards for *E. coli* became effective in March 2010.

Increased monitoring for *Ceriodaphnia dubia* chronic whole effluent toxicity is proposed for the first 27 months of the permit to evaluate whether a Toxicity Reduction Evaluation (TRE) is needed. Limits are proposed for the remainder of the permit after the first 27 months.

The Director is proposing to renew Van Wert's coverage under the general mercury variance.

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; outfall signage; downstream public water supply (PWS) notification; and pretreatment program requirements.

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

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

For additional information about this fact sheet or the draft permit, contact Megan Zale, (614) 644-2027, megan.zale@epa.ohio.gov.

Location of Discharge/Receiving Water Use Classification

The Van Wert WWTP discharges to Town Creek at River Mile (RM) 13.87. Town Creek combines with Maddox Creek to form Middle Creek. Figure 1 shows the approximate location of the facility.

This segment of Town Creek is described by Ohio EPA River Code: 04-143, U.S. EPA River Reach #: 04100007-012, County: Van Wert, Ecoregion: Clayey, High Lime Till Plains in the Eastern Corn Belt Plains. Town Creek is designated for the following uses under Ohio's WQS (Ohio Administrative Code [OAC] 3745-1-11): Modified Warmwater Habitat (MWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Secondary Contact Recreation (SCR).

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

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

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

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

Facility Description

The Van Wert WWTP was updated in 2001, and has an average daily design flow of 4.0 million gallons per day (MGD). Wet stream processes include influent pumping, screening and grit removal, preaeration, primary settling, activated sludge aeration, phosphorus removal by chemical precipitation, secondary clarification and ultraviolet disinfection. Solid stream processes are aerobic digestion, dewatering by belt filter press, lime stabilization, biosolids disposal by land application at agronomic rates, landfill disposal, and transfer to another facility.

The city of Van Wert (City) implements an Ohio EPA-approved industrial pretreatment program. Two categorical industrial users discharge an average flow of 0.0873 MGD to the treatment plant based on information in the 2012 NPDES renewal application.

The Van Wert collection system is approximately 30 percent separate sanitary sewers and 70 percent combined sewers. There are five combined sewer overflows (CSOs) on the combined portion of the system. Ohio EPA approved the City's long-term control plan in 2011. The Nine Minimum Controls (NMC) for reducing CSOs were included in Van Wert's NPDES permit, and required improvements that were listed in the CSO inspection letter dated on 11/01/12 are included in Part II of the permit renewal.

Description of Existing Discharge

Table 1 presents a summary of unaltered discharge monitoring report data for Van Wert WWTP outfall 2PD00006001. Data are presented for the period August 2008 through July 2013, and current permit limits are provided for comparison. Table 2 presents additional chemical specific data collected by Ohio EPA and by the City as part of its industrial pretreatment programs. Table 3 summarizes the chemical specific data for outfall 001 and presents the average and maximum Projected Effluent Quality (PEQ) values. Table 8 summarizes the results of acute screen whole effluent toxicity tests of outfall 001 effluent conducted by Ohio EPA. Table 4 summarizes the discharges from the City's CSOs for the period August 2008 through July 2013.

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

CSO outfall 2PD00006002 has been closed as reported to Ohio EPA officials and verified in a facility inspection on November 1, 2012, and re-stated in a December 5, 2013 letter to the Van Wert city mayor and council.

Assessment of Impact on Receiving Waters

No current data is available to assess the impact of the Van Wert WWTP and its CSOs on Town Creek. Monitoring is scheduled for 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 Van Wert WWTP were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA - Discharge Monitoring Report (DMR) data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR)	August 2008 through July 2013
NPDES Application data / Pretreatment data	2008 through 2012
Ohio EPA compliance sampling data	2011

The data were examined, and the following values were removed from the evaluation to give a more reliable PEQ: 15.2 TUc for *Ceriodaphnia dubia* on 8/19/11 at outfall 001. This was eliminated because the test statistics showed extremely high variability among the test replicates for coefficient of variation (CV), a measure of variability. The CVs ranged from 72% - 101%. The control CV was 27%, which is normal variability.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points. The average and maximum PEQ values are presented in Table 3.

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required. See Table 9 for a summary of the screening results.

Wasteload Allocation For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. 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 (MWH)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer 30Q10
		Winter 30Q10
Wildlife		Annual 90Q10
AWS		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

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

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

The data used in the WLA are listed in Tables 3 and 5. The WLA results to maintain all applicable criteria are presented in Table 7. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

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

WQS for WET are expressed in Ohio's narrative "free from" WQS rule [OAC 3745-1-04(D)]. These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). Wasteload allocations 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 Van Wert WWTP, the WLA values are 0.3 TU_a and 1.01 TU_c.

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

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

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

$$TU_c = 100/\text{geometric mean of the No Observed Effect Concentration (NOEC) and the Lowest Observed Effect Concentration (LOEC)}$$

The acute toxicity unit (TU_a) is defined as 100 divided by the Lethal Concentration, 50% (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>Wasteload Allocation</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 wasteload allocation for Van Wert is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1.0 to 1.

Reasonable Potential/ Effluent Limits/Hazard Management Decisions

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the 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 7. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 3, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [(PEQ_{avg} ÷ PEL_{avg}) X 100, or (PEQ_{max} ÷ PEL_{max}) X 100], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 8.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 10 presents the final effluent limits and monitoring requirements proposed for Van Wert WWTP outfall 2PD00006001 and the basis for their recommendation.

The limits proposed for dissolved oxygen, Carbonaceous Biochemical Oxygen Demand (CBOD₅), total suspended solids, and ammonia-nitrogen are a continuation of existing permit conditions and are design criteria for the treatment plant. The existing ammonia-nitrogen limits were evaluated, and they are protective of WQS.

The limits proposed for oil and grease, pH, and *E. coli* are based on Ohio WQS (OAC 3745-1-07). Phosphorus is limited based on provisions of OAC 3745-33-06(C). These are a continuation of existing permit conditions except for *E. coli*, which will replace fecal coliform limits. The limits proposed for *E. coli* are consistent with WQS which became effective in March 2010.

Mercury Reasonable Potential and Mercury Variance The Ohio EPA risk assessment (Table 9) places mercury in group 5. This placement as well as the data in Tables 3, 5, and 7 indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality.

To comply with mercury limits, the permittee has applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the OAC. Based on the results of low-level mercury monitoring, the permittee has determined that its WWTP cannot meet the 30-day average water quality-based effluent limit (WQBEL) of 1.3 nanograms per liter (ng/l). However, the permittee believes that the plant will be able to achieve an annual average mercury effluent concentration of 12 ng/l. The variance application 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 on these factors, the permittee is eligible for coverage under the general mercury variance.

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the Ohio Administrative Code. Items V, W, and X in Part II of the draft NPDES permit list the provisions of the mercury variance, and includes the following requirements:

- A variance-based monthly average effluent limit of 3.7 ng/l, which was developed from sampling data submitted by the permittee, and is a reduction from 4.9 ng/l;
- 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 Pollutant Minimization Program (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.

The Ohio EPA risk assessment (Table 9) places Bis(2-ethylhexyl)phthalate, Selenium, and Total Filterable Residue in group 5, which recommends limits to protect water quality. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), we are proposing monitoring, rather than limits, for these pollutants. The PEQ values calculated for these parameters (Table 3) may not be representative of its actual levels in the plant effluent they were based on 1 data point for Bis(2-ethylhexyl)phthalate, 2 data points for Total Dissolved Solids, and 1 data point above the detection limit out of 7 for Selenium. The purpose of the proposed monitoring is to collect additional data on the frequency of occurrence and variability of these pollutants in the plant's effluent.

Ohio EPA risk assessment (Table 9) places Copper in group 4. This placement as well as the data in Tables 1, 2, and 3 support that this parameter does not have the reasonable potential to contribute to WQS exceedances,

and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC Rule 3745-33-07(A)(2).

Ohio EPA risk assessment (Table 9) places Arsenic, Aluminum, Barium, Cadmium, Chloroform, Chromium, Hexavalent Chromium, Cyanide, Iron, Lead, Manganese, Nickel, Nitrate+Nitrite, Silver, Strontium, Phenol, and Zinc in groups 2 and 3. This placement as well as the data in Tables 1, 2, and 3 support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring for Cadmium, Chromium, Hexavalent Chromium, Cyanide, Lead, Nickel, Silver, and Zinc is proposed to document that these pollutants continue to remain at low levels.

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, and transfer to another facility with an NPDES permit.

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

Whole Effluent Toxicity Reasonable Potential

Evaluating the acute and chronic toxicity results in Table 8 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, gives an acute PEQ value of 0.3 TU_a and an (estimated) chronic PEQ of 2.5 TU_c. Reasonable potential for toxicity is demonstrated, since these values exceed the wasteload allocation values of 0.3 TU_a and 1.01 TU_c. Consistent with Procedure 6 and OAC 3745-33-07(B)(10), a monthly average limit of 1.0 TU_c and a daily maximum limit of 1.0 TU_a are proposed. It is proposed that the final effluent limits for toxicity become effective 27 months from the effective date of the permit. Semi-annual monitoring with a trigger to conduct a toxicity reduction evaluation is proposed as the interim condition.

Other Requirements

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

Operator Certification

Operator certification requirements have been included in Part II, Item A of the permit in accordance with rules adopted in December 2006. These rules require the Van Wert WWTP to have a Class III wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001.

Operator of Record

In December 2006, OAC rule revisions became effective that affect the requirements for certified operators for sewage collection systems and treatment works regulated under NPDES permits. Part II, Item A of this NPDES permit is included to implement rule 3745-7-02 of the OAC. It requires the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

Storm Water Compliance

In order to comply with industrial storm water regulations, the permittee submitted a form for "No Exposure Certification" which was signed on December 18, 2013. Compliance with the industrial storm water regulations

must be re-affirmed every five years. No later than December 18, 2018, 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 maintain signs at each outfall to Town Creek providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

Figure 1. Location of Van Wert WWTP

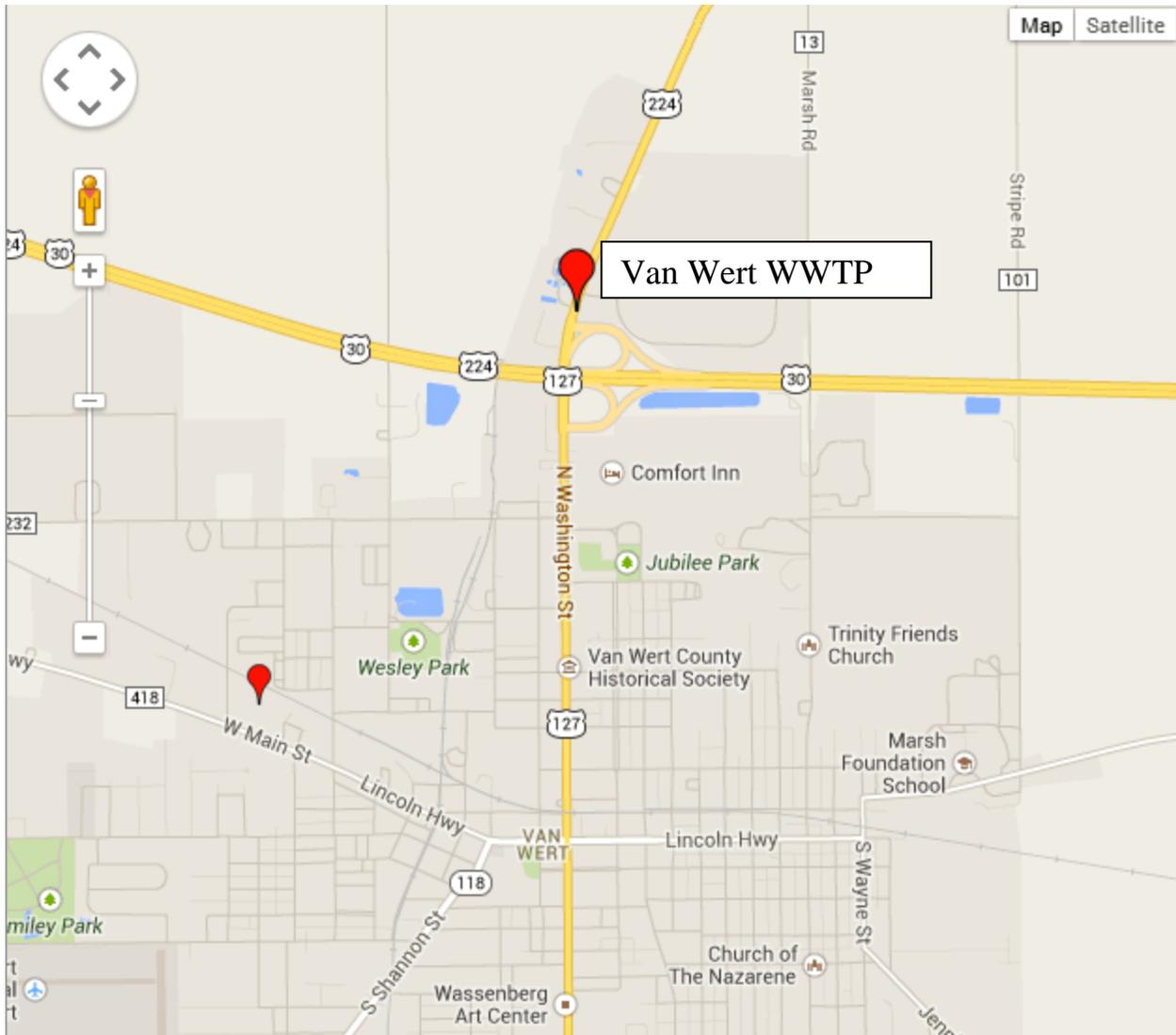


Table 1. Effluent Characterization Using Self-Monitoring Data

Fact Sheet for NPDES Permit Renewal, Van Wert WWTP, 2014

Summary of current permit limits and unaltered discharge monitoring report data for Van Wert WWTP outfall 2PD00006001 (August 2008 – July 2013). All values are based on annual records unless otherwise indicated. * = For pH, 5th percentile shown in place of 50th percentile; ** = For dissolved oxygen, 5th percentile shown in place of 95th percentile; a = weekly average.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Water Temperature	Annual	° C	Monitor		1817	16.9	25.4	7-50
Dissolved Oxygen**	Summer	mg/L	7.0 Minimum		445	7.9	7.3	7-10
Dissolved Oxygen**	Winter	mg/L	5.3 Minimum		312	10.4	9.3	7.6-12.3
pH*	Annual	S.U.	6.5 to 9.0		1288	6.9	7.5	4.6-8.1
Total Suspended Solids	Summer	mg/L	12	18 ^a	237	5	9	0-14
Total Suspended Solids	Winter	mg/L	18	26 ^a	180	9	15	3-34
Oil and Grease	Annual	mg/L		10	60	0	0	0-6.6
Ammonia	Summer	mg/L	1.3	1.9 ^a	240	0	0	0-1.6
Ammonia	Winter	mg/L	3.5	5.2 ^a	181	0	0.2	0-7.2
Nitrite Plus Nitrate	Annual	mg/L	Monitor		60	9.755	18.32	2.5-22.2
Phosphorus	Annual	mg/L	1	1.5 ^a	248	0.5	1	0.06-1.8
Cyanide, Free	Annual	mg/L	Monitor		20	0	0	0-0
Nickel	Annual	µg/L	Monitor		21	0	0	0-8
Silver	Annual	µg/L	1.3	7.7	61	0	0	0-0
Zinc	Annual	µg/L	Monitor		61	45	72	17-91
Cadmium	Annual	µg/L	Monitor		21	0	0	0-0
Lead	Annual	µg/L	20	396	61	0	0	0-0
Chromium	Annual	µg/L	Monitor		21	0	0	0-7
Copper	Annual	µg/L	Monitor		61	0	11	0-46
Chromium, Dissolved Hexavalent	Annual	µg/L	Monitor		23	0	0	0-0
Fecal Coliform	Annual	#/100mL	2500	5000 ^a	358	12	363.1	1-11
Flow Rate	Summer	MGD	Monitor		608	1.743	3.962	1.2-8.3
Flow Rate	Winter	MGD	Monitor		451	2.353	6.71	1.3-8.7
Flow Rate	Annual	MGD	Monitor		1824	2.0485	6.399	1.2-16.5
Mercury	Annual	ng/L	4.9	1700	60	1.035	2.973	0-4.8
Carbonaceous Biochemical Oxygen Demand (CBOD ₅)	Summer	mg/L	10	15 ^a	230	2.3	4.71	0-10
CBOD ₅	Winter	mg/L	13.5	20.25 ^a	176	3.5	6.825	0-9.7

Table 2. Effluent Characterization Using Ohio EPA and Pretreatment Data

Summary of analytical results for Van Wert WWTP outfall 2PD00006001. Units µg/L unless otherwise noted; OEPA = data from analyses by Ohio EPA; PT = data from pretreatment program reports; N/A = not analyzed.

Parameter	OEPA 3/14/11	OEPA 5/2/11	PT 4/23/08	PT 4/8/09	PT 4/13/10	PT 4/27/11	PT 4/4/12
Carbonaceous Biochemical Oxygen Demand, mg/L	<2.0	<2.0	N/A	N/A	N/A	N/A	N/A
Total Dissolved Solids, mg/L	578	460	N/A	N/A	N/A	N/A	N/A
Total Suspended Solids, mg/L	<5	8	N/A	N/A	N/A	N/A	N/A
Antimony	N/A	N/A	<5.0	<5.0	<5.0	<5.0	<5.0
Arsenic	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<5.0
Beryllium	N/A	N/A	<3.0	<3.0	<3.0	<3.0	<3.0
Cadmium	<0.20	<0.20	<3.0	<3.0	<3.0	<3.0	<3.0
Chromium	<2.0	<2.0	<7.0	<7.0	<7.0	<7.0	<7.0
Copper	3.1	4	<8.0	<8.0	<8.0	<8.0	9.0
Lead	<2.0	<2.0	<10.0	<10.0	<10.0	<10.0	<10.0
Nickel	3.5	3.8	<8.0	<8.0	<8.0	<8.0	<8.0
Selenium	2.4	<2.0	<4.0	<4.0	<4.0	<4.0	<4.0
Aluminum	617	776	N/A	N/A	N/A	N/A	N/A
Barium	32	33	N/A	N/A	N/A	N/A	N/A
Calcium, mg/L	85	74	N/A	N/A	N/A	N/A	N/A
Hardness, Total, mg/L	299	263	N/A	N/A	N/A	N/A	N/A
Iron	<50	138	N/A	N/A	N/A	N/A	N/A
Magnesium, mg/L	21	19	N/A	N/A	N/A	N/A	N/A
Manganese	<10	11	N/A	N/A	N/A	N/A	N/A
Strontium	806	68	N/A	N/A	N/A	N/A	N/A
Zinc	43	37	53	28	58	14	54
Mercury	<0.20	<0.20	<200	<200	<200	<200	<200
Ammonia, mg/L	<0.050	<0.050	N/A	N/A	N/A	N/A	N/A
Chloride, mg/L	101	74	N/A	N/A	N/A	N/A	N/A
Nitrate+Nitrite, mg/L	9.76	8.05	N/A	N/A	N/A	N/A	N/A
Total Kjehldahl Nitrogen, mg/L	1.02	0.9	N/A	N/A	N/A	N/A	N/A
Total Phosphorus, mg/L	0.199	0.328	N/A	N/A	N/A	N/A	N/A
Oil & Grease, mg/L	<2.0	<2.0	N/A	N/A	N/A	N/A	N/A
Cyanide, Free	<5	<5	N/A	N/A	N/A	N/A	N/A
Chloroform	1.29	1.04	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	N/A	0.61	N/A	N/A	N/A	N/A	N/A
Bis(2-ethylhexyl)phthalate	<10.5	<2.1	<5.0	<5.0	<5.0	<5.0	13.8
Phenol	<10.4	<2.1	<10.0	<10.0	<10.0	<10.0	11.7

Table 3. Effluent Data for the Van Wert WWTP

Parameter	Units	Number of	Number > Method Detection	Projected Effluent Quality	Projected Effluent Quality
		Samples	Limit	Average	Maximum
Aluminum	µg/L	2	2	2152.624	2948.8
Ammonia-Summer	mg/l	241	8	0.8176	1.12
Ammonia-Winter	mg/l	182	11	4.2048	5.76
Arsenic	µg/L	7	0	--	--
Barium	µg/L	2	2	91.542	125.4
Cadmium	µg/L	28	0	--	--
Chlorides	mg/l	2	2	280.174	383.8
Chloroform (Trichloromethane)	µg/L	2	2	3.57846	4.902
Chromium	µg/L	27	1	6.132	8.4
Chromium Hexavalent, Dissolved	µg/L	23	0	--	--
Copper	µg/L	68	19	11.246	17.73
Cyanide - free	mg/l	22	0	--	--
Dissolved solids (average)	mg/l	2	2	1603.372	2196.4
Iron	µg/L	2	1	382.812	524.4
Lead	µg/L	68	0	--	--
Magnesium	mg/l	2	2	58.254	79.8
Manganese	µg/L	2	1	30.514	41.8
Mercury	ng/l	67	57	2.376	3.6773
Nickel	µg/L	27	3	7.008	9.6
Nitrate+ Nitrite	mg/l	62	62	16.391	23.334
Phosphorus	mg/l	250	250	0.88622	1.2536
Selenium	µg/L	7	1	5.84	8
Silver	µg/L	66	0	--	--
Strontium	µg/L	2	2	2235.844	3062.8
Total Kjehldahl Nitrogen	mg/l	2	2	2.82948	3.876
Zinc	µg/L	68	68	62.958	83.131
Bis(2-ethylhexyl)phthalate	µg/L	1	1	62.4588	85.56
Phenol	µg/L	1	1	52.9542	72.54

Table 4. Van Wert Combined Sewer Overflow Discharges

Summary of discharge monitoring report data for combined sewer overflow (CSO) discharges for the period August 2008 through July 2013.

CSO Station	Number of Occurrences	Total Volume (Million Gallons)	Average Volume (Million Gallons)
004	259	116.19	0.45
005	113	54.34	0.48
007	72	45.18	0.63
009	120	80.71	0.67
010	101	25.68	0.25

Table 5. Water Quality 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			
Aluminum		--	4500	--	--	--	--	
Ammonia-Summer	mg/l	--	--	--	2.4	--	--	
Ammonia-Winter	mg/l	--	--	--	5.4	--	--	
Arsenic	µg/L	--	580	100	150	340	680	
Barium	µg/L	--	160000	--	220	2000	4000	
Cadmium	µg/L	--	730	50	4.6	11	22	
Chlorides	mg/l	--	--	--	--	--	--	
Chloroform (Trichloromethane)	µg/L	--	1700c	--	140	1300	2600	
Chromium	µg/L	--	14000	100	160	3500	6900	
Hexavalent Chromium, Dissolved	µg/L	--	14000	--	11	16	31	
Copper	µg/L	--	64000	500	18	30	59	
Cyanide, free	mg/l	--	48	--	0.0052	0.022	0.044	
Dissolved solids (average)	mg/l	--	--	--	1500	--	--	
Iron	µg/L	--	--	5000	--	--	--	
Lead	µg/L	--	--	100	18	340	670	
Magnesium	mg/l	--	--	--	--	--	--	
Manganese	µg/L	--	61000	--	--	--	--	
Mercury	ng/l	1.3	3.1	10000	910	1700	3400	
Nickel	µg/L	--	43000	200	100	920	1800	
Nitrate + Nitrite	mg/l	--	--	100	--	--	--	
Phosphorus	mg/l	--	--	--	--	--	--	
Selenium	µg/L	--	3100	50	5	--	--	
Silver	µg/L	--	11000	--	1.3	6.3	13	
Strontium	µg/L	--	1400000	--	21000	40000	81000	
Total Kjeldahl Nitrogen	mg/l	--	--	--	--	--	--	
Zinc	µg/L	--	35000	25000	230	230	470	
Bis(2-ethylhexyl)phthalate	µg/L	--	32c	--	8.4	1100	2100	
Phenol	µg/L	--	2400	--	400	4700	9400	

Table 6. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
<i>Stream Flows</i>				
1Q10*	cfs	annual	0.26	USGS* 04187500
7Q10	cfs	annual	0.28	USGS 04187500
		summer	0	
		winter	0	
30Q10	cfs	summer	0.29	USGS 04187500
		winter	0.29	USGS 04187500
90Q10	cfs	annual	0.3	
Harmonic Mean	cfs	annual	0.38	USGS 04187500
Mixing Assumption	%	average	25	
	%	maximum	100	
<i>Hardness</i>	mg/L	annual	221	901 station 50th percentile
<i>pH</i>	S.U.	summer	7.7	901 station
		winter	7.7	901 station
<i>Temperature</i>	° C	summer	24.2	901 station
		winter	10.675	901 station
<i>Van Wert WWTP flow</i>	cfs	annual	6.188	
<i>Background Water Quality</i>				
Aluminum	µg/L		0	No representative data available. SWIMS*; 2008-2013; n*=20;
Ammonia, Summer	mg/L		0	15<MDL*; Station 801 50th percentile SWIMS; 2008-2013; n=11; 9<MDL;
Ammonia, Winter	mg/L		0	Station 801 50th percentile
Arsenic	µg/L		0	No representative data available.
Barium	µg/L		0	No representative data available.
Cadmium	µg/L		0	No representative data available.
Chlorides	mg/L		0	No representative data available.
Chloroform (Trichloromethane)	µg/L		0	No representative data available.
Chromium	µg/L		0	No representative data available.
Chromium Hexavalent, Dissolved	µg/L		0	No representative data available.
Copper	µg/L		0	No representative data available.
Cyanide - free	mg/L		0	No representative data available.
Dissolved solids (average)	mg/L		0	No representative data available.
Iron	µg/L		0	No representative data available.
Lead	µg/L		0	No representative data available.
Magnesium	mg/L		22	STORET*; 2011; n=2; 0<MDL; Station P02W05
Manganese	µg/L		0	No representative data available.
Mercury	ng/l		0	No representative data available.
Nickel	µg/L		0	No representative data available.
Nitrate+ Nitrite	mg/L		0	No representative data available.

Table 6. (continued)

Phosphorus	mg/L	0	No representative data available.
Selenium	µg/L	0	No representative data available.
Silver	µg/L	0	No representative data available.
Strontium	µg/L	0	No representative data available.
Total Kjeldahl Nitrogen	mg/L	0	No representative data available.
Zinc	µg/L	0	No representative data available.
Bis(2-ethylhexyl)phthalate	µg/L	0	No representative data available.
Phenol	µg/L	0	No representative data available.

*Acronym definitions:

MDL=method detection limit;

n=number of samples;

STORET=United States Environmental Protection Agency Storage and Retrieval Data Warehouse;

SWIMS=Ohio Environmental Protection Agency Division of Surface Water Information Management System;

USGS=United States Geological Survey

Table 7. Summary of Effluent Limits to Maintain Applicable WQ Criteria

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Wildlife	Average			Maximum Aquatic Life	
			Human Health	Agri-culture	Aquatic Life		
Aluminum	µg/L	--	4569	--	--	--	--
Ammonia, Summer	mg/L	--	--	--	--	--	--
Ammonia, Winter	mg/L	--	--	--	--	--	--
Arsenic	µg/L	--	589	102	152	354	680
Barium	µg/L	--	162456	--	222	2084	4000
Cadmium	µg/L	--	741	51	4.7	11	22
Chlorides	mg/L	--	--	--	--	--	--
Chloroform (Trichloromethane)	µg/L	--	1726	--	142	1355	2600
Chromium	µg/L	--	14215	102	162	3647	6900
Chromium Hexavalent, Dissolved	µg/L	--	14215	--	11	17	31
Copper	µg/L	--	64983	508	18	31	59
Cyanide - free	mg/L	--	49	--	0.0053	0.023	0.044
Dissolved solids (average)	mg/L	--	--	--	1500	--	--
Iron	µg/L	--	--	5077	--	--	--
Lead	µg/L	--	--	102	18	354	670
Magnesium	mg/L	--	--	--	--	--	--
Manganese	µg/L	--	61936	--	--	--	--
Mercury	ng/L	1.3	3.1	10000	910	1700	3400
Nickel	µg/L	--	43660	203	101	959	1800
Nitrate+ Nitrite	mg/L	--	--	102	--	--	--
Phosphorus	mg/L	--	--	--	--	--	--
Selenium	µg/L	--	3148	51	5.1	--	--
Silver	µg/L	--	11169	--	1.3	6.6	13
Strontium	µg/L	--	1421493	--	21238	41681	81000
TKN	mg/L	--	--	--	--	--	--
Zinc	µg/L	--	35537	25384	233	240	470
Bis(2-ethylhexyl)phthalate	µg/L	--	32	--	8.5	1146	2100
Phenol	µg/L	--	2437	--	405	4897	9400

Table 8. Toxicity Data for Van Wert WWTP

Test Date ^a	<i>Ceriodaphnia dubia</i> , 48 hours	<i>Pimephales promelas</i> , 96 hours	<i>Ceriodaphnia dubia</i> , 7 days	<i>Pimephales promelas</i> , 7 days
	TU ^a ^{b*}	TU ^a ^b	TU ^c ^b	TU ^c ^b
8/8/2008 (E*)	AA*	AA	1.1	AA
8/12/2009 (E)	AA	AA	AA	AA
8/13/2010 (E)	AA	AA	AA	AA
3/21/11 (O*)	AA	--	--	--
5/9/11 (O)	AA	--	--	--
8/19/2011 (E)	AA	AA	15.2**	AA
8/24/2012 (E)	AA	AA	AA	AA
8/20/2013 (E)	AA	AA	AA	AA

*Definitions:

- AA=not detected;
- E=Entity (facility) test;
- O=Ohio Environmental Protection Agency test;
- TU=Toxicity Units

** Data point discarded due to very high/abnormal within-treatment variability

Table 9. Parameter Assessment

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

Chlorides
Total Kjehldahl Nitrogen

Magnesium

Phosphorus

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

Arsenic
Chromium
Iron
Nickel
Strontium
Chloroform (Trichloromethane)

Cadmium
Hexavalent Chromium, Dissolved
Lead
Nitrate + Nitrite
Phenol

Silver
Cyanide - free
Manganese

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

Aluminum

Barium

Zinc

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.

Copper

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>
Dissolved solids (average)	mg/L	1517	--
Mercury	ng/L	1.3	1700
Selenium	µg/L	5.1	--
Bis(2-ethylhexyl)phthalate	µg/L	8.5	1146

*Acronym definitions:

- PEL=Preliminary Effluent Limits
- PEQ=Projected Effluent Quality
- WLA=Wasteload Allocation
- WQS=Water Quality Standards

Table 10. Final Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations				Basis ^b
		Concentration		Loading (kg/day) ^a		
		Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	
Flow	MGD	----- Monitor -----				M
Temperature	°C	----- Monitor -----				M
Dissolved Oxygen	mg/L					
Summer		7.0 minimum		--	--	EP, PD
Winter		5.3 minimum		--	--	EP, PD
Carbonaceous Biochemical Oxygen Demand	mg/L					
Summer		10.0	15.0 ^c	152	227 ^c	EP, PD
Winter		13.5	20.25 ^c	203	307 ^c	EP, PD
Suspended Solids	mg/L					
Summer		12	18 ^c	181	273 ^c	EP, PD
Winter		18	26 ^c	272	394 ^c	EP, PD
Ammonia	mg/L					
Summer		1.3	1.9 ^c	20	25 ^c	EP, PD
Winter		3.5	5.2 ^c	53	76 ^c	EP, PD
Oil and Grease	mg/L	--	10	--	--	WQS, EP
pH	S.U.	----- 6.5 to 9.0 -----				WQS, EP
Fecal Coliform						
Summer Only (Interim)	#/100mL	2500	5000 ^c	--	--	WQS, EP
<i>E. coli</i>						
Summer Only (Final)	#/100mL	1030	2318	--	--	WQS
Phosphorus, Total	mg/L	1.0	1.5 ^c	15	23 ^c	PT
Nitrite+Nitrate	mg/L	----- Monitor -----				M
Cyanide, Free	mg/L	----- Monitor -----				EP, M
Cadmium	µg/L	----- Monitor -----				EP, M
Chromium	µg/L	----- Monitor -----				EP, M
Hex. Chromium (Dissolved)	µg/L	----- Monitor -----				RP, M
Copper	µg/L	----- Monitor -----				EP, M
Lead	µg/L	----- Monitor -----				RP, M
Mercury	ng/L	3.7	1700	0.000057	0.0257	VAR, RP
Nickel	µg/L	----- Monitor -----				EP, M
Silver	µg/L	----- Monitor -----				RP, M
Zinc	µg/L	----- Monitor -----				EP, M
Selenium	µg/L	----- Monitor -----				RP, M
Bis(2-ethylhexyl) phthalate	µg/L	----- Monitor -----				RP, M
Whole Effluent Toxicity						
Acute (Interim)	TUa	----- Monitor -----				BEJ, WET
Chronic (Interim)	TUc	----- Monitor -----				BEJ, WET
Acute (Final)	TUa	--	0.3	--	--	BEJ, WET
Chronic (Final)	TUc	--	1.01	--	--	BEJ, WET
Total Filterable Residue (Dissolved Solids)	mg/L	----- Monitor -----				RP, BEJ
Total Kjeldahl Nitrogen	mg/L	----- Monitor -----				EP, M

^a Effluent loadings based on average design discharge flow of 4.0 MGD.

^b Definitions: BEJ = Best Engineering Judgment;
EP = Existing Permit;
M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges;
PD = Plant Design Criteria;
PT = Phosphorus treatment required under Ohio Administrative Code (OAC) 3745-33-06(C);
RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits [OAC 3745-33-07(A)];
VAR = mercury variance-based limits, OAC 3745-33-07(D)(10);
WET = Reasonable potential for requiring water quality-based effluent limits and monitoring requirements for whole effluent toxicity in NPDES permits [OAC 3745-33-07(B)];
WQS = Ohio Water Quality Standards (OAC 3745-1-07).

^c Weekly average limit.