National Pollutant Discharge Elimination System (NPDES) Permit Program

# FACT SHEET

Regarding an NPDES Permit to Discharge to Waters of the State of Ohio
for the **Upper Olentangy Water Reclamation Center**

Public Notice No.: 16-12-001
Public Notice Date: December 1, 2016
Comment Period Ends: January 1, 2017

Ohio EPA Permit No.: **4PD00004*ND**
Application No.: **OH0024911**

Name and Address of Applicant:
**City of Delaware**
**Municipal Building**
**1 South Sandusky Street**
**Delaware, OH 443015**

Name and Address of Facility Where Discharge Occurs:
**Upper Olentangy Water Reclamation Center**
**225 Cherry Street**
**Delaware, Ohio 43105**
**Delaware County**

Receiving Water: **Olentangy River**

Subsequent Stream Network: **Scioto River to Ohio River**

## INTRODUCTION

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

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

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**

New monitoring is proposed for dissolved orthophosphate to comply with Senate Bill 1 requirements.

New monitoring is proposed for Lindane and strontium based on reasonable potential for impacts to water quality due to limited data set as allowed per OAC 3745-33-07(A)(5).

New 30-day average winter ammonia-nitrogen final effluent limitations has been included in the permit based on reasonable potential for impacts to water quality due per OAC 3745-33-07(A)(5). Based on best technical judgment, it is expected the facility will be able to comply when the new effluent limitations when permit becomes effective.

Final effluent limitations and monitoring requirement for total recoverable copper have been maintained in the renewal permit due to reasonable potential for impacts to water quality.

Final effluent limits and monitoring requirements are proposed to be removed for Bis (2-ethylhexyl) phthalate because of lack of reasonable potential for water quality impacts.

Monitoring requirements are proposed to be removed for 1,4 Dichlorobenzene because of lack of reasonable potential for water quality impacts.

Total cyanide, total recoverable nickel, total recoverable zinc, total recoverable cadmium, total recoverable lead, total recoverable chromium and dissolved hexavalent chromium are being removed from the downstream monitoring station 4PD00004901.

Schedules of compliance for evaluating the current tertiary filtration is included in Part I.C of the permit, which requires the city to evaluate the removal, repair, upgrade or replacement of the current tertiary filtration system, as well as for the City to report the analytical capabilities of its lab to test for aldrin and dieldrin and the associated costs.

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.

In Part II of the permit, special conditions are included that address sanitary sewer overflow (SSO) reporting; operator certification, minimum staffing and operator of record; whole effluent toxicity (WET) testing; storm water compliance; pretreatment program requirements; method detection levels for total recoverable copper and Lindane; and outfall signage.

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## PROCEDURES FOR PARTICIPATION IN THE FORMULATION OF FINAL DETERMINATIONS

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

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

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

**Legal Records Section**
**Ohio Environmental Protection Agency**
**P.O. Box 1049**
**Columbus, Ohio 43216-1049**

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

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

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

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

For additional information about this fact sheet or the draft permit, contact John Owen, P.E., direct phone: (614) 728-3849, e-mail: john.owen@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 City of Delaware – Upper Olentangy Water Reclamation Center (WRC) discharges to the Olentangy River at River Mile 25.27. Figure 1 shows the approximate location of the facility. The following designated uses are applicable to this section of the Olentangy River: warmwater habitat (WWH), agricultural water supply (AWS), industrial water supply (IWS), primary contact recreation (PCR). This segment is further identified by Ohio EPA River Code 02-400, and is in Watershed Assessment Unit #05060001 11 01. This section of the Olentangy River is in the Eastern Corn Belt Plains ecoregion.


**Figure 1**

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 Upper Olentangy WRC is a tertiary treatment facility with an average design flow 10.0 million gallons per day (MGD). The treatment plant was originally constructed in 1926, with the most recent major upgrade occurring in 2007. The treatment plant processes and/or equipment include:

- influent pumping;
- bar screen;
- grit removal;
- scum removal;
- primary sedimentation;
- biological nitrification and BOD removal;
- biological de-nitrification;
- ferric chloride addition (secondary);
- secondary clarification;
- tertiary sand filters (5.0 MGD maximum);
- polymer addition (secondary); and
- ultra-violet disinfection.

**Table 1 – Annual Sludge Disposal**

| Year | Landfilling (Dry Tons) |
|---|---|
| 2011 | 1092.00 |
| 2012 | 1141.26 |
| 2013 | 1115.00 |
| 2014 | 1108.16 |
| 2015 | 1144.00 |

Sludge is processed using gravity thickeners, a filter press, and ultimately disposed at a municipal sanitary landfill. Since 2011, the quantity of sludge removed from the WWTP has remained relatively constant. (See Table 1 above.)

City of Delaware has no bypasses around preliminary treatment, biological treatment or final clarification. However, the tertiary filters are hydraulically limited to a total flow of 5.0 MGD and are utilized as a side-stream unit, with the remaining unfiltered effluent conveyed directly to UV disinfection and post aeration. Effluent from the tertiary filters is re-combined with the unfiltered effluent at UV disinfection. All effluent received UV disinfection and post aeration prior be being discharged directly to the Olentangy River. See Figure 2 for a schematic of the treatment works.

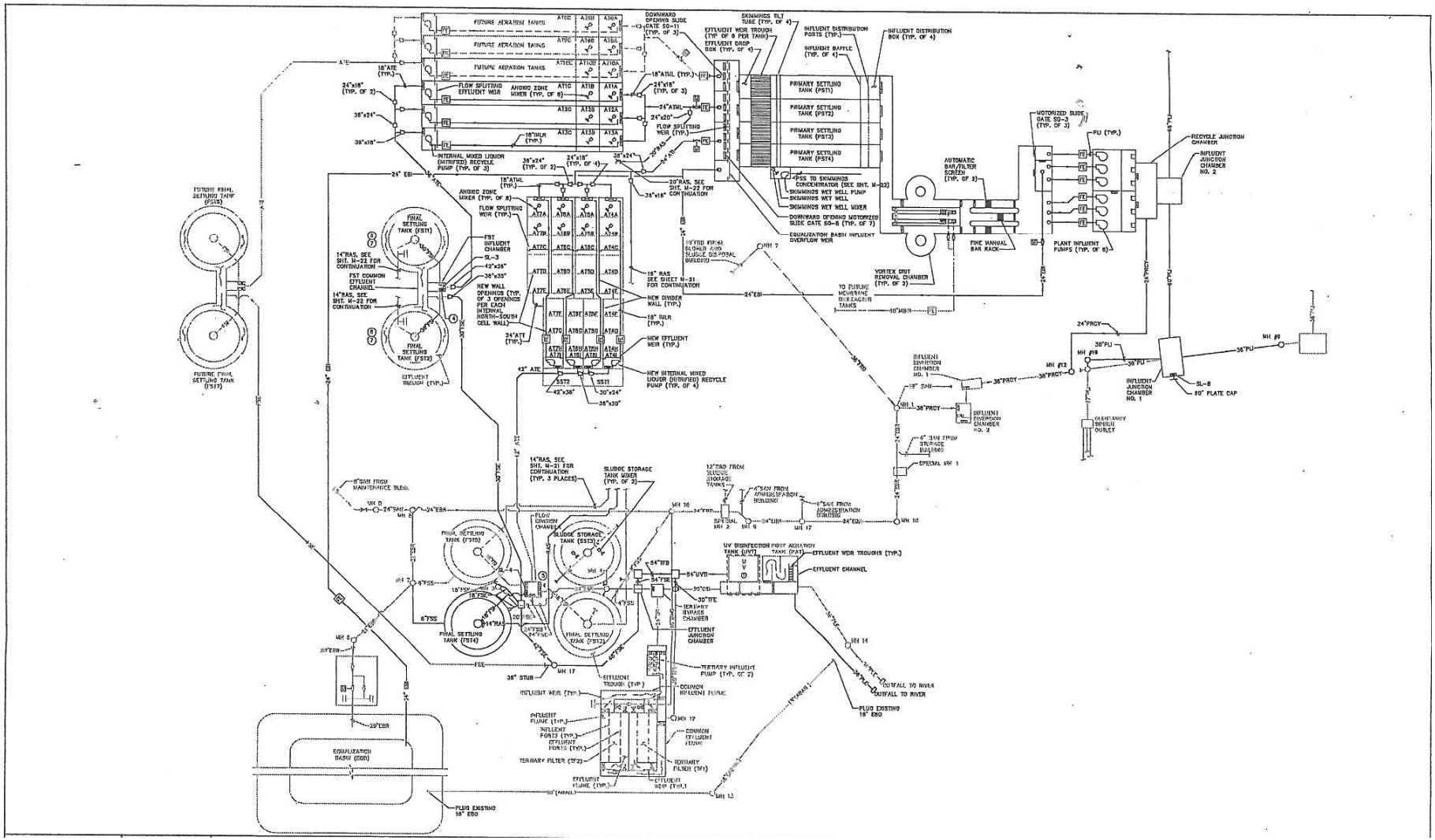


**Figure 2 Wastewater Treatment Plant Schematic**

The City of Delaware operates a 100 % separated collection system that serves a population of approximately 37,500.

The City of Delaware does have an approved pretreatment program. The City of Delaware has six (6) significant industrial users with one (1) being categorical user falling under the Transportation Equipment Cleaning Point Source Category listed in 40 CFR 442. All significant industrial users generate approximately 45,600 gallons per day (gpd) of industrial wastewater, with the categorical user generating approximately 1,600 gpd.

The City was a water treatment plant that uses water from both surface water and groundwater wells.

City of Delaware estimates there is an infiltration/inflow (I/I) rate to the collection system of 0.800 MGD. The median, 95$^{th}$ percentile and maximum flow rates for City of Delaware from the previous five and half years are presented in Table 2. City of Delaware performs the following activities to minimize I/I: annual slip-lining and grouting of sanitary sewers and smoke testing of sewers within drainage.

City of Delaware also reports system-wide sanitary sewer overflows (SSOs) at station 4PD00004300. Thirteen (13) SSOs were reported over the past five and half years. Table 3 summarized the SSOs report since the last permit was issued.

**Table 3 System-Wide SSO Summary 2011-2016**

| Year | Number Reported |
|---|---|
| 2011 | 4 |
| 2012 | 0 |
| 2013 | 1 |
| 2014 | 0 |
| 2015 | 2 |
| 2016* | 6 |

(*) Through June 2016

**Table 2 - Effluent Flow Rates for Upper Olentangy Water Reclamation Center: 2011-2016**

| Year | Annual Flow in MGD | | |
|---|---|---|---|
| | 50$^{th}$ Percentile | 95$^{th}$ Percentile | Maximum |
| 2011 | 4.493 | 10.422 | 18.270 |
| 2012 | 3.724 | 6.738 | 14.445 |
| 2013 | 4.143 | 7.979 | 18.273 |
| 2014 | 3.975 | 7.360 | 15.099 |
| 2015 | 3.898 | 8.023 | 16.219 |
| 2016* | 3.971 | 6.604 | 30.320 |

(*) Through June 2016

Additionally, City of Delaware reports bypasses around its tertiary filtration system at station 4PD00004602. All influent flows are directed through preliminary treatment, biological treatment and final clarification. However, effluent from the final clarifiers is directed to a weir box which is set to direct a maximum flow of 5.0 MGD to the existing traveling bridge, tertiary sand filters. Remaining effluent flow is conveyed directly to UV disinfection, post aeration, effluent sampling and flow monitoring. Effluent flow from the tertiary filters is directed back to UV disinfection and post aeration where is combines with the unfiltered clarifier effluent.

From June 2011 to June 2016, DMR documents that the bypass around the tertiary filters is utilized approximately 89% of the time. Because of this, the draft permit includes a schedule of compliance requiring the City to evaluate repairing, replacing, expanding or eliminating the current tertiary filtration system and still comply with final effluent limitations contain in Part I.A of the renewal permit. Should the City decide to maintain some form of tertiary filtration, the filters would need to be upgraded, replaced or repaired to treat the facility's design peak hourly flow.

## DESCRIPTION OF EXISTING DISCHARGE

Since January of 2011, the City of Delaware had a total of 13 numeric, concentration violation: 5 concentration violations for Total Inorganic Nitrogen, 4 concentration violations for ammonia-nitrogen, 1 violation for *E. coli* and 3 violations of the minimum dissolved oxygen limitation. These violations are shown in Table 4.

**Table 4 - Effluent Violations 1/2011 – 7/2016**

| Parameter | Number of Violations | |
|---|---|---|
| | Concentration | Loading |
| Ammonia-Nitrogen | 4 | -- |
| Total Inorganic Nitrogen | 5 | -- |
| Dissolved Oxygen | 3 | -- |
| *e. coli* | 1 | -- |

These violations were caused by adjustments to the treatment system to accommodate the seasonal effluent limitations or were the result of high flow events. These violations have since been addressed by updating seasonal process controls when changing plant configurations to accommodate season permit limitations.

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

Table 7 presents chemical specific data compiled from data reported in annual pretreatment reports as well as the chemical specific data compiled from data collected by Ohio EPA.

Table 6 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period January 2011 to June 2016, and current permit limits are provided for comparison.

Table 8 summarizes the chemical specific data for outfall 4PD00004001 by presenting the average and maximum PEQ values.

Table 9 summarizes the results of acute and chronic WET tests of the final effluent submitted by the City, and Table 10 summarizes the screening results of Ohio EPA bioassay sampling of the final effluent.

## ASSESSMENT OF IMPACT ON RECEIVING WATERS

The Deep Run – Olentangy River watershed assessment unit, which includes the Olentangy River in the vicinity of Upper Olentangy WRC, is listed as impaired for aquatic life and recreation on Ohio's 2016 303(d) list. However, in either case, no TMDL is necessary for the Olentangy River since one approved by U.S. EPA on September 19, 2007.

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 bio-criteria. Partial attainment means that one or more of the applicable indices fails meet the bio-criteria. Nonattainment means that either none of the applicable indices meet the bio-criteria or one of the organism groups indicates poor or very poor performance. An aquatic life use attainment table (see Table 5) 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 Olentangy River was evaluated by OEPA staff for aquatic life and recreational use potential during the 2003-04 field seasons. This assessment included the collection of water chemistry and biological sampling at numerous sites in the Olentangy River and selected tributaries. A summary of the results from this assessment for the portion of the Olentangy River in the vicinity of the Upper Olentangy Water Reclamation Center and the Olentangy Environmental Control Center discharges can be found below in Table 5.

More information on the 2003-04 sampling can be found in the following technical support document (TSD): *"Biological and Water Quality Study of the Olentangy River, Whetstone Creek and Select Tributaries 2003-04"*, OEPA, 2005.

This document is available through the OEPA, Division of Surface Water website at http://epa.ohio.gov/dsw/document_index/psdindx.aspx.

**Table 5. A Summary of the Olentangy River Use Designation Status, and Causes/Sources of Impairment, 2003-04 Survey.**

| Table 5 | A Summary of the Olentangy River Use Designation Status, and Causes/Sources of Impairment, 2003-04 Survey. | | | | |
|---|---|---|---|---|---|
| **Location** | **RM** | **Aquatic Life Use Designation** | **Attainment Status** | **Causes of Impairment** | **Sources of Impairment** |
| Olentangy R. adj. Hudson Rd. | 27.5 | WWH | FULL | | |
| Olentangy R. @ Olentangy Ave.; dst Up. Olentangy WRC discharge | 24.5 | WWH | FULL | | |
| Olentangy R. @ Hyatts Rd. | 19.4 | EWH | PARTIAL | Nutrient Enrichment, Siltation | Urbanization |
| Olentangy R. @ Powell Rd. | 15.0 | EWH | FULL | | |
| Olentangy R. dst OECC discharge | 12.4 | EWH | FULL | | |
| Olentangy R. dst. Bill Moose Trib. | 7.8 | WWH | FULL | | |
| Olentangy R. @ Dodridge Ave. | 3.9 | WWH | FULL | | |

A Total Daily Maximum Load (TMDL) report was approved for the Olentangy River basin on September 19, 2007 by US EPA. However, the March 24, 2015, Supreme Court of Ohio decision *Fairfield Cty. Bd. of Commrs. v. Nally, Slip Opinion No. 2015-Ohio-991* vacated all previously approved TMDLs. As of August 2016, this TMDL is considered a technical guidance document pending final TMDL approval.

The TMDL is available through the Ohio EPA, Division of Surface Water website at: http://www.epa.ohio.gov/portals/35/tmdl/OlentangyTMDL_final_aug07.pdf .

The 2016 Integrated Water Quality Report provides the current status of the stream segment the Olentangy WRC discharges to, the Deep Run-Olentangy River, Assessment Unit 05060001 11 01 which is 48.91 $mi^2$. The Integrated Report indicates that the Deep Run-Olentangy River assessment unit is attaining its human health designation based on historical data, but it's recreational use and aquatic life uses are impaired, but a TMDL is not needed since one was completed in 2007. However, the attainment of the public drinking water supply designation is unknown since there is insufficient data.

The aquatic life non-attainment designation in the 2016 report was associated with the 2010 biological assessment of the Wild Cat Run tributary to the Olentangy River whose confluence is at river mile (RM) 17.9. The non-attainment was not related to the Upper Olentangy WRC. The Olentangy River main stem was meeting the aquatic life use designation based upon the results of 2009 biological sampling.

## 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.

The Upper Olentangy Water Reclamation Center discharges to the Olentangy River approximately 12 miles upstream of the Olentangy Environmental Control Center (OECC). Due to the distance between these two discharges, they are not considered to be interactive. See Figure 3 below.

### Parameter Selection

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

| | |
|---|---|
| Self-monitoring data (DMR) | January 2011through June 2016 |
| Pretreatment data | 2011 through 2015 |
| Ohio EPA compliance sampling data | 2014 |
| Ohio EPA bioassay sampling data | 2014 |

### Statistical Outliers and Other Non-Representative Data

The data from the sources above were examined, and some sample values were removed from the evaluation due to high method detection levels. In this situation, pretreatment scan data listed in Table 7 for Aldrin, Dieldrin, Lindane and Selenium were eliminated due to high MDLs.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ ($PEQ_{avg}$) values represent the 95$^{th}$ percentile of monthly average data, and maximum PEQ ($PEQ_{max}$) values represent the 95$^{th}$ percentile of all data points (see Table 8)

The PEQ values are used according to Ohio rules to compare to the 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 14).

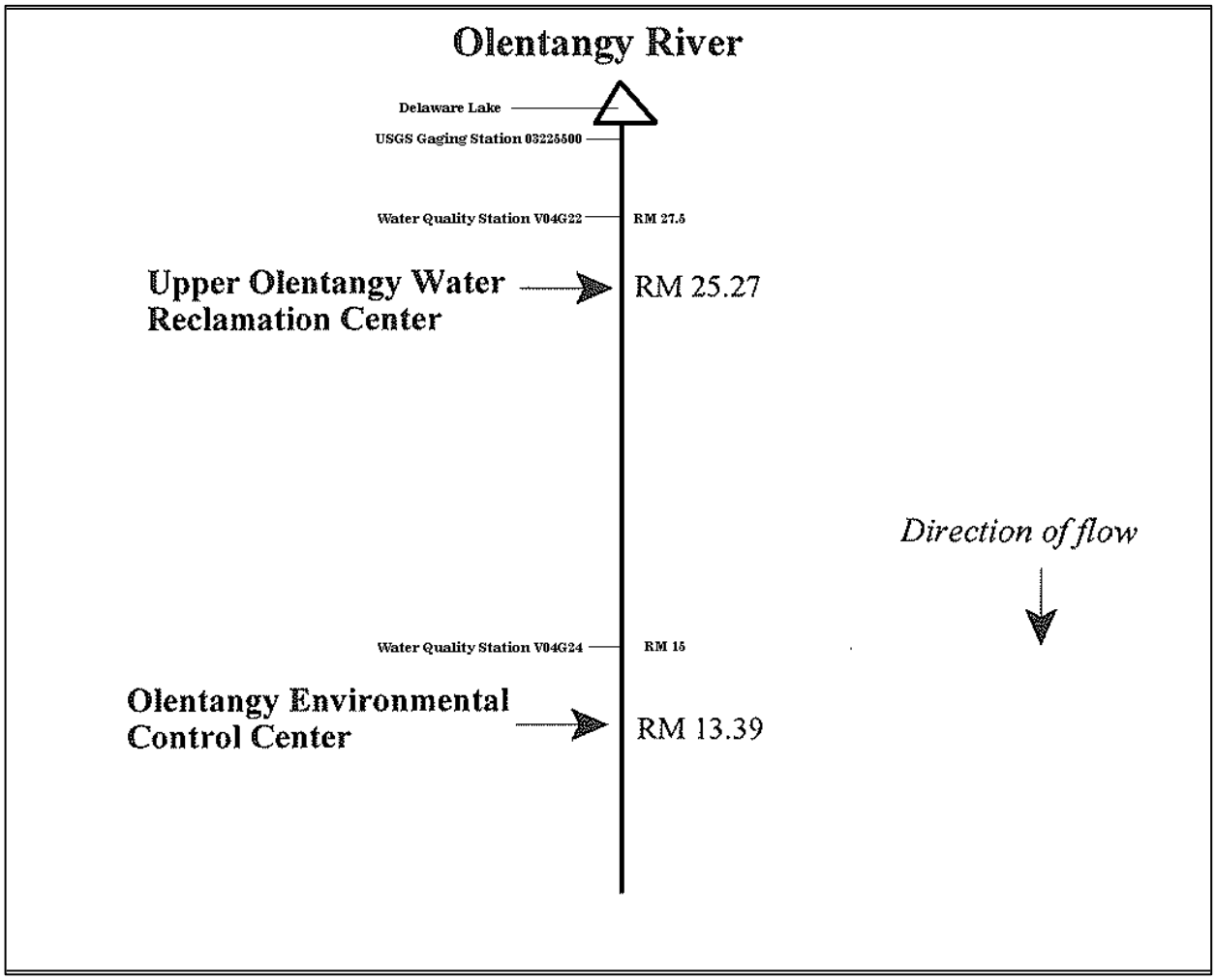


**Figure 3 Olentangy River Study Area.**

**Wasteload Allocation**

For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not break down in the receiving water. 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 |
| 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 12, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

The data used in the WLA are listed in Tables 11 and 12. The WLA results to maintain all applicable criteria are presented in Table 13.

**Whole Effluent Toxicity Wasteload Allocation**

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

WQS for WET are expressed in Ohio's narrative "free from" WQS rule [OAC 3745-1-04(D)]. These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). WLAs can then be calculated using TUs as if they were water quality criteria.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit ($TU_c$) and 7Q10 flow for the average and the acute toxicity unit ($TU_a$) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For City of Delaware, 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 ($IC_{25}$):

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

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

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

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

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

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

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

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

$$\text{Stream Dilution Ratio} = \frac{1Q10 + [\text{WWTP flow rate}]}{[\text{WWTP flow rate}]} = \frac{0 \text{ cfs} + 15.47 \text{ cfs}}{15.47 \text{ cfs}} = 1$$

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

## REASONABLE POTENTIAL/EFFLUENT LIMITS/MANAGEMENT DECISIONS

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 13. The average PEL ($PEL_{avg}$) is compared to the average PEQ ($PEQ_{avg}$) from Table 8, and the $PEL_{max}$ is compared to the $PEQ_{max}$. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 14.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 15 presents the final effluent limits and monitoring requirements proposed for City of Delaware outfall 4PD00004001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

### Dissolved Oxygen, Total Suspended Solids, Summer Ammonia, Total Inorganic Nitrogen, Total Phosphorus, $CBOD_5$

The limits proposed for dissolved oxygen, total suspended solids, summer ammonia-nitrogen, total inorganic nitrogen, total phosphorus and 5-day carbonaceous biochemical oxygen demand are all based on plant design criteria. These limits are protective of WQS.

### Oil and Grease, pH, *Escherichia coli*

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

### Copper

The Ohio EPA risk assessment (Table 14) places total recoverable copper in group 5. This placement, as well as the data in Tables 6 and 8, indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality.

### Winter Ammonia

The current ammonia limits have been evaluated using the WLA procedures. Based upon current downstream (4PD00004901) water quality data, the current seasonal, summer monthly average ammonia-nitrogen effluent limitation is protective of WQS for ammonia toxicity. However, based upon the current downstream water quality, the current seasonal winter monthly average ammonia-nitrogen effluent was found not to be protective of WQS for ammonia toxicity. As such, the WLA result was incorporated into the draft permit as the proposed winter limit. No schedule of compliance was determined to be necessary based on the effluent data contained in Table 6.

### Aldrin and Dieldrin

The Ohio EPA risk assessment (Table 14) places aldrin and dieldrin in group 5, which recommends limits to protect water quality. These pollutants are legacy pesticides that have not been manufactured or used in the United States for at least three decades.

The calculated PEQ values (Table 8) may not be representative of the actual level in the plant effluent since they are based on small data sets with only two (2) tests conducted by Ohio EPA using a method sufficiently sensitive to evaluate compliance with water quality standards. In addition, the preliminary effluent limits (Table 14) for these pollutants are less than the method detection limits reported by labs that perform analytical work for Ohio wastewater plants.

Ohio EPA's data for these two pollutants at the Upper Olentangy plant (Table 7) showed one result above detection and one below. Considering these results and the above information, limits or monitoring are not proposed based on best technical judgment. The permit will include a provision for the City to report the

analytical capabilities of its lab to test for these pollutants and the associated costs. If resources allow, the Agency will conduct additional monitoring for these pollutants in the plant's effluent during the term of this permit.

**Lindane**
The Ohio EPA risk assessment (Table 14) places Lindane in group 5, which recommends limits to protect water quality. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), semi-annual monitoring rather than limits is proposed for these parameters. The PEQ values calculated for Lindane in (see Table 8) may not be representative of its actual levels in the plant effluent since they were based on two (2) data points. 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

**Free Cyanide, Mercury, Strontium**
The Ohio EPA risk assessment (Table 14) places free cyanide, low level mercury and strontium in group 4. This placement, as well as the data in Tables 6 and 8, 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 Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC 3745-33-07(A)(2).

**Cadmium, Chromium, Hexavalent Chromium, Lead, Nickel, Zinc, Total Filterable Residue (Dissolved Solids)**
The Ohio EPA risk assessment (Table 14) places these pollutants in groups 2 and 3. This placement, as well as the data in Tables 6 and 8, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. However, monitoring will be maintained at a reduced frequency to continue to characterize the effluent in an effort to document that these pollutants continue to remain at low levels and to evaluate the performance of the treatment plant.

**Total Kjeldahl Nitrogen**
Monitoring will be maintained for this parameter to continue to characterize the nutrient load of the effluent.

**Antimony, Arsenic, Barium, Beryllium, Bis(2-chloroethyl) Ether, 1,4-Dichlocobenzene, Iron, Silver, Thallium, Bis(2-ethylhexyl)phthalate, Selenium**
The Ohio EPA risk assessment (Table 14) places these pollutants in groups 2 and 3. This placement, as well as the data in Tables 6 and 8, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. No new monitoring is proposed. Monitoring for selenium and 1,4-Dichlorobenzene is proposed to be removed. Monitoring and effluent limitations for bis(2-ethylhexyl) phthalate are proposed to be removed.

**Dissolved Orthophosphate Monitoring**
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.

**Carcinogenic Effects**
Aldrin, Dieldrin and Bis(2-ethylhexyl are carcinogens, which require the evaluation of the additive effect of these pollutants. OAC 3745-33-07(A)(8) states that the additivity equation must be included in the permit and used to determine compliance unless certain conditions are met. One of the conditions in the rule referenced above states that a pollutant may be removed from the consideration of additivity if the PEL for the pollutant is less than the quantification level for that pollutant. For each of these pollutants, the average PELs are less than the respective quantification levels, so these parameters can be removed from the additivity equation. As a result, the compliance equation does not need to be included in the permit.

**Whole Effluent Toxicity Reasonable Potential**
Based on evaluating the WET data presented in Tables 9 and 10 and other pertinent data under the provisions of OAC 3745-33-07(B), the City of Delaware is placed in Category 4 with respect to WET. While this indicates that the plant's effluent does not currently pose a toxicity problem, annual toxicity testing is proposed consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit.

**Changes to Downstream Monitoring Station 4PD40004901**
Monitoring for total cyanide, nickel, zinc, cadmium, lead, chromium, hexavalent chromium, nickel, and zinc are proposed to be removed at the downstream monitoring station 4PD00004901 since there is no evidence of impairment associated with these parameters. However, downstream copper monitoring will be maintained given the reasonable potential of impact water quality.

**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**
Consistent with OAC 3745-40, the permit contains monitoring requirements proposed for the disposal of sewage sludge by transferring to another NPDES permitted facility (Station 4PD00004588) and alternately to a sanitary landfill (Station 4PD00004586). The City has indicated that they during this permit cycle they will not be utilizing land application. As such, those limitations and monitoring requirement will be removed from the permit.

**OTHER REQUIREMENTS**

**Compliance Schedules:**
***Pretreatment Local Limits Review*** - A twelve (12) month compliance schedule is proposed for the City of Delaware to submit a technical justification for either revising its local industrial user limits or retaining its existing local limits. If revisions to local limits are required, the City must also submit a pretreatment program modification request. Details are in Part I.C of the permit.

***Tertiary Filtration System Evaluation*** - A twelve (12) month compliance schedule is proposed for the City of Delaware to evaluate the current tertiary filtration system. The compliance schedule requires the City to submit an evaluation report regarding repairing, upgrading, replacing, expanding or removing the tertiary filtration system and the continued compliance with the terms and condition of the NPDES permit.

***Aldrin and Dieldrin*** - A twelve (12) month compliance schedule is proposed for the City of Delaware to submit documentation regarding its testing laboratory's method detection limits (MDL) for Aldrin and Dieldrin, as well as the cost of the analyses. The City of Delaware will also be required to submit updated documentation from its testing laboratory on the lab's method detection limit (MDL) for Aldrin and Dieldrin and on the cost of the analyses with the next NPDES permit renewal application.

**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 City of Delaware to have a Class IV 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.

**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.

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

**Defined Method Detection Limits**
Part II of the permit contains provisions that specify method detection levels for total recoverable copper and Lindane. Sampling data submitted by the permittee had detect levels for these pollutants that were insufficiently sensitive to accurately quantify these two pollutants.

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

**Storm Water Compliance**
Parts IV, V, and VI have been included with the draft permit to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the City of Delaware may seek permit coverage under the general permit for industrial storm water (permit # OHR000005) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the City of Delaware submits a Notice of Intent (NOI) for coverage under the general permit for industrial storm water or submits a No Exposure Certification, 2) Ohio EPA determines that the facility is eligible for coverage under the general permit or meets the requirements for a No Exposure Certification, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

**Table 6. Effluent Characterization and Decision Criteria: 2011 - 2016**

| Parameter | Season | Units | Current Permit Limits | | # Obs. | Percentiles | | Data Range |
|---|---|---|---|---|---|---|---|---|
| | | | 30 day | Daily | | 50th | 95th | |
| **Outfall 001** | | | | | | | | |
| Water Temperature | Annual | C | Monitor Only | | 2008 | 17.2 | 22.7 | 8.6-23.8 |
| Dissolved Oxygen | Summer | mg/l | Not Less than 7.0 | | 981 | 8.9 | 10.1 | 6.2-12.2 |
| Dissolved Oxygen | Winter | mg/l | Not Less than 7.0 | | 1027 | 9.5 | 11.2 | 6.6-12.2 |
| Total Suspended Solids | Summer | mg/l | 14 | 21 | 1999 | 0 | 6.4 | 0-35.2 |
| Total Suspended Solids | Winter | mg/l | 25 | 37 | | | | |
| Oil and Grease, Hexane Extr Method | Annual | mg/l | -- | 10 | 266 | 0 | 3 | 0-8.8 |
| Nitrogen, Ammonia (NH3) | Summer | mg/l | 0.75 | 1.12 | 981 | 0 | 0.867 | 0-12.4 |
| Nitrogen, Ammonia (NH3) | Winter | mg/l | 3.1 | 4.65 | 1026 | 0 | 2.11 | 0-10.7 |
| Nitrogen Kjeldahl, Total | Annual | mg/l | Monitor Only | | 69 | 0.99 | 2.93 | 0-9.78 |
| Nitrogen, Inorganic, Total | Summer | mg/l | 6.3 | 9.5 | 135 | 5 | 7.91 | 1.48-10.3 |
| Nitrogen, Inorganic, Total | Winter | mg/l | 8.1 | 12.2 | | | | |
| Phosphorus, Total (P) | Annual | mg/l | 1.0 | 1.5 | 534 | 0.38 | 0.954 | 0-1.99 |
| Cyanide, Free | Annual | mg/l | Monitor Only | | 67 | 0 | 0 | 0-0.009 |
| Selenium, Total Recoverable | Annual | ug/l | Monitor Only | | 66 | 0 | 0 | 0-1.6 |
| Nickel, Total Recoverable | Annual | ug/l | Monitor Only | | 66 | 0 | 0 | 0-14 |
| Zinc, Total Recoverable | Annual | ug/l | Monitor Only | | 66 | 30 | 54.5 | 11-60 |
| Cadmium, Total Recoverable | Annual | ug/l | Monitor Only | | 66 | 0 | 0 | 0-0 |
| Lead, Total Recoverable | Annual | ug/l | Monitor Only | | 67 | 0 | 2.54 | 0-5.5 |
| Chromium, Total Recoverable | Annual | ug/l | Monitor Only | | 66 | 0 | 0 | 0-29 |
| Copper, Total Recoverable | Annual | ug/l | 18 | 29 | 133 | 0 | 6.8 | 0-24 |
| Chromium, Dissolved Hexavalent | Annual | ug/l | Monitor Only | | 66 | 0 | 0 | 0-0 |
| E. coli | Annual | #/100 ml | 126 | 284 | 438 | 10.8 | 210 | 0-2420 |
| 1,4-Dichlorobenzene | Annual | ug/l | Monitor Only | | 66 | 0 | 0 | 0-0 |
| Bis(2-ethylhexyl) Phthalate | Annual | ug/l | 8.4 | 1100 | 66 | 0 | 1.53 | 0-3.9 |
| Flow Rate | Summer | MGD | Monitor Only | | 981 | 3.59 | 7.17 | 2.38-30.3 |
| Flow Rate | Winter | MGD | Monitor Only | | 1027 | 4.41 | 8.53 | 2.01-18.3 |
| Flow Rate | Annual | MGD | Monitor Only | | 2008 | 4 | 7.93 | 2.01-30.3 |
| Mercury, Total (Low Level) | Annual | ng/l | Monitor Only | | 66 | 0 | 5.25 | 0-11.9 |
| Acute Tox., Ceriodaphnia dubia | Annual | TUa | Monitor Only | | 5 | 0 | 0 | 0-0 |
| Chronic Tox., Ceriodaphnia dubia | Annual | TUc | Monitor Only | | 5 | 0 | 0.8 | 0-1 |
| Acute Tox., Pimephales promelas | Annual | TUa | Monitor Only | | 5 | 0 | 0 | 0-0 |
| Chronic Tox., Pimephales promelas | Annual | TUc | Monitor Only | | 5 | 0 | 0 | 0-0 |
| pH, Maximum | Annual | S.U. | | 6.5 | 2004 | 7.9 | 8.3 | 6.9-8.9 |
| pH, Minimum | Annual | S.U. | | 9.0 | 2008 | 7.5 | 7.9 | 6.7-8.6 |
| Residue, Total Filterable | Annual | mg/l | Monitor Only | | 67 | 560 | 825 | 400-1340 |
| CBOD 5 day | Summer | mg/l | 10 | 15 | 976 | 1.2 | 2.44 | 0-7.45 |
| CBOD 5 day | Winter | mg/l | 18 | 25 | 1025 | 1.6 | 5.5 | 0-16.1 |

**Table 7 – Ohio EPA and City of Delaware Pretreatment Priority Pollutant Scan Results**

| PARAMETER | Ohio EPA 4/22/2014 | Ohio EPA 10/7/2014 | PT 9/27/2011 | PT 7/18/2012 | PT 9/27/2013 | PT 9/10/2014 | PT 9/9/2015 |
|---|---|---|---|---|---|---|---|
| Total Dissolved Solids (mg/L) | 748 | 542 | NT | NT | NT | NT | NT |
| Antimony | NT | NT | AA (3.0) | AA (5.0) | AA (5.0) | AA (5.0) | AA (5.0) |
| Arsenic | 0.9 | 1.4 | AA (3.0) | AA (5.0) | AA (5.0) | AA (5.0) | AA (5.0) |
| Beryllium | NT | NT | AA (0.5) | AA (3.0) | AA (3.0) | AA (3.0) | AA (3.0) |
| Cadmium | AA (0.2) | AA (0.2) | AA (0.5) | AA (3.0) | AA (3.0) | AA (3.0) | AA (3.0) |
| Chromium | AA (2.0) | AA (2.0) | AA (10) | AA (7.0) | AA (7.0) | AA (7.0) | AA (7.0) |
| Copper | 2.1 | 2.6 | AA (10) | AA (8.0) | AA (8.0) | AA (8.0) | AA (8.0) |
| Lead | AA (2.0) | AA (2.0) | AA (2.0) | AA (10) | AA (10) | AA (10) | AA (10) |
| Nickel | 3.8 | 4.4 | AA (10) | AA (8.0) | AA (8.0) | AA (8.0) | AA (8.0) |
| Selenium | 0.7 | 0.4 | AA (3.0) | AA (4.0) | AA (4.0) | AA (4.0) | AA (4.0) |
| Silver | NT | NT | AA (5.0) | AA (1.0) | AA (5.0) | AA (5.0) | AA (5.0) |
| Thallium | NT | NT | AA (1.0) | AA (5.0) | AA (5.0) | AA (5.0) | AA (5.0) |
| Aluminum | AA (200) | AA (200) | NT | NT | NT | NT | NT |
| Barium | 19 | 7.0 | NT | NT | NT | NT | NT |
| Iron | 110 | 227 | NT | NT | NT | NT | NT |
| Manganese | 61 | 24 | NT | NT | NT | NT | NT |
| Strontium | 2010 | 4330 | NT | NT | NT | NT | NT |
| Zinc | 22 | 39 | 20 | 43 | 19 | 23 | 35 |
| Mercury | AA (0.2) | AA (0.2) | AA (0.2) | AA (0.2) | AA (0.2) | AA (0.2) | AA (0.2) |
| Ammonia (mg/L) | 0.06 | AA (0.05) | NT | NT | NT | NT | NT |
| Chloride (mg/L) | 151 | 108 | NT | NT | NT | NT | NT |
| Nitrate + Nitrite (mg/L) | 5.61 | 9.95 | NT | NT | NT | NT | NT |
| 1, 4 - Dichlorobenzene | AA (0.5) | AA (0.5) | AA (5.0) | AA (5.0) | AA (5.0) | AA (5.0) | AA (5.0) |
| Bis (2-ethylhexyl) phthalate | AA (10.8) | NT | AA (10) | AA (5.0) | 6.2 | AA (5.0) | AA (5.0) |
| Bis (2-Chloroethyl) ether | 0.2 | NT | AA (10.0) | AA (10.0) | AA (10.0) | AA (10.0) | AA (10.0) |
| Aldrin | AA (0.0022) | 0.0079 | AA (0.1) | AA (0.25) | AA (0.25) | AA (0.25) | AA (0.25) |
| Dieldrin | 0.0046 | AA (0.0023) | AA (0.1) | AA (0.5) | AA (0.5) | AA (0.5) | AA (0.5) |
| Lindane | 0.022 | AA (0.0023) | AA (0.1) | AA (0.25) | AA (0.25) | AA (0.25) | AA (0.25) |

**Table 8. Projected Effluent Quality for the Upper Olentangy WRC**

| Parameter | Units | Number of Samples | Number > MDL | PEQ Average | PEQ Maximum |
|---|---|---|---|---|---|
| Aldrin* | µg/L | 2 | 1 | 0.0219146 | 0.03002 |
| Aluminum* | µg/L | 2 | 0 | -- | -- |
| Ammonia (Summer) | mg/L | 640 | 146 | 0.75 | 1.12 |
| Ammonia (Winter) | mg/L | 510 | 231 | 3.1 | 4.65 |
| Antimony* | µg/L | 5 | 0 | -- | -- |
| Arsenic – TR* | µg/L | 2 | 2 | 3.8836 | 5.32 |
| Barium* | µg/L | 2 | 2 | 52.706 | 72.2 |
| Beryllium* | µg/L | 5 | 0 | -- | -- |
| Bis(2-chloroethyl) ether* | µg/L | 1 | 1 | 0.9052 | 1.24 |
| Bis(2-ethylhexyl) phthalate* | µg/L | 71 | 7 | 2.8009 | 3.1419 |
| Cadmium – TR* | µg/L | 66 | 0 | -- | -- |
| Chlorides | mg/L | 2 | 2 | 418.874 | 573.8 |
| Chromium - TR | µg/L | 66 | 1 | 21.17 | 29 |
| Hexavalent Chromium | µg/L | 66 | 0 | -- | -- |
| Copper - TR | µg/L | 140 | 15 | 14.016 | 19.2 |
| Cyanide, Free | mg/L | 48 | 1 | 0.007227 | 0.0099 |
| 1,4-Dichlorobenzene* | µg/L | 66 | 0 | -- | -- |
| Dieldrin (BCC)* | µg/L | 2 | 1 | 0.0127604 | 0.01748 |
| Dissolved Solids | mg/L | 67 | 67 | 719 | 860.77 |
| Iron – TR | µg/L | 2 | 2 | 629.698 | 862.6 |
| Lead – TR | µg/L | 67 | 7 | 2.14 | 3.3741 |
| Lindane* | µg/L | 2 | 1 | 0.061028 | 0.0836 |
| Manganese – TR | µg/L | 2 | 2 | 169.214 | 231.8 |
| Mercury | ng/L | 66 | 29 | 6.0754 | 7.5115 |
| Nickel - TR | µg/L | 68 | 5 | 10.22 | 14 |
| Selenium – TR* | µg/L | 10 | 3 | 1.986 | 2.72 |
| Silver | µg/L | 5 | 0 | -- | -- |
| Strontium* | µg/L | 2 | 2 | 12011.42 | 16454 |
| Thallium | µg/L | 5 | 0 | -- | -- |
| Zinc - TR | µg/L | 73 | 73 | 43.107 | 56.533 |

MDL = analytical method detection limit
PEQ = projected effluent quality
(*) = Data set includes Ohio EPA and Pretreatment Scan Data from Table 7

**Table 9. Summary of Acute and Chronic Toxicity Results**

| | *Ceriodaphnia Dubia* | | *Pimephales promelas* | |
|---|---|---|---|---|
| Date | $TU_a$ | $TU_c$ | $TU_a$ | $TU_c$ |
| 9/01/2011 | AA | AA | AA | AA |
| 9/17/2012 | AA | AA | AA | AA |
| 9/10/2013 | AA | AA | AA | AA |
| 9/01/2014 | AA | 1.0 | AA | AA |
| 9/01/2015 | 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 10. Ohio EPA Toxicity Screening Results for Outfall 001**

| | *Pimephales promelas* %M | | *Ceriodaphnia dubia* %M | |
|---|---|---|---|---|
| Date | 24 hours | 48 hours | 24 hours | 48 hours |
| 04/22/2014 | 0 | 0 | 0 | 5 |
| 10/07/2014 | 0 | 0 | 0 | 0 |

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

**Table 11. Water Quality Criteria in the Study Area**

| Parameter | Units | Outside Mixing Zone Criteria | | | | Inside Mixing Zone Maximum |
|---|---|---|---|---|---|---|
| | | Average | | | Maximum | |
| | | Human Health | Agri-culture | Aquatic Life | Aquatic Life | |
| Aldrin | µg/L | 0.0014[c] | -- | -- | -- | -- |
| Aluminum | µg/L | -- | -- | -- | -- | -- |
| Ammonia (Summer) | mg/L | -- | -- | 1.1 | -- | -- |
| Ammonia (Winter) | mg/L | -- | -- | 2.2 | -- | -- |
| Antimony | µg/L | 4300 | -- | 190 | 900 | 1800 |
| Arsenic - TR | µg/L | -- | 100 | 150 | 340 | 680 |
| Barium | µg/L | -- | -- | 220 | 2000 | 4000 |
| Beryllium | µg/L | 280 | 100 | 39 | 330 | 660 |
| Bis (2-chloroethyl) ether | µg/L | 14[c] | -- | -- | -- | -- |
| Bis (2-ethylhexyl) phthalate | µg/L | 59[c] | -- | 8.4 | 1100 | 2100 |
| Cadmium - TR | µg/L | -- | 50 | 4.6 | 11 | 22 |
| Chlorides | mg/L | -- | -- | -- | -- | -- |
| Chromium - TR | µg/L | -- | 100 | 160 | 3400 | 6900 |
| Hexavalent Chromium | µg/L | -- | -- | 11 | 16 | 31 |
| Copper - TR | µg/L | 1300 | 500 | 18 | 29 | 59 |
| Cyanide, Free | mg/L | 220 | -- | 0.012 | 0.046 | 0.092 |
| 1,4-Dichlorobenzene | µg/L | 2600 | -- | 9.4 | 57 | 110 |
| Dieldrin (BCC) | µg/L | 0.0014[c] | -- | 0.056 | 0.24 | 0.47 |
| Dissolved Solids | mg/L | -- | -- | 1500 | -- | -- |
| Iron - TR | µg/L | -- | 5000 | -- | -- | -- |
| Lead - TR | µg/L | -- | 100 | 18 | 330 | 670 |
| Lindane | µg/L | 0.63[c] | -- | 0.057 | 0.95 | 1.9 |
| Manganese - TR | µg/L | -- | -- | -- | -- | -- |
| Mercury | ng/L | 12 | 10000 | 910 | 1700 | 3400 |
| Nickel - TR | µg/L | 4600 | 200 | 100 | 910 | 1800 |
| Selenium - TR | µg/L | 11000 | 50 | 5 | -- | -- |
| Silver | µg/L | -- | -- | 1.3 | 6.2 | 12 |
| Strontium | µg/L | -- | -- | 21000 | 40000 | 81000 |
| Thallium | µg/L | 6.3 | -- | 17 | 79 | 160 |
| Zinc - TR | µg/L | 69000 | 25000 | 230 | 230 | 470 |

[c] = carcinogen

**Table 12. Instream Conditions and Discharger Flow**

| Parameter | Units | Season | Value | Basis |
|---|---|---|---|---|
| *Stream Flows* | | | | |
| 1Q10 | cfs | annual | 0 | USGS gage#03225500; 1979-2009 data |
| 7Q10 | cfs | annual | 0 | USGS gage#03225500; 1979-2009 data |
| 30Q10 | cfs | summer | 2.55 | USGS gage#03225500; 1979-2009 data |
| | | winter | 4.73 | USGS gage#03225500; 1979-2009 data |
| Harmonic Mean | cfs | annual | 41 | USGS gage#03225500; 1979-2009 data |
| Mixing Assumption | % | average | 100 | |
| | | maximum | 100 | |
| *Hardness, OMZ* | mg/L | annual | 220 | U. Olentangy WRC 901; 66 obs., 2011-16 |
| *Hardness, IMZ* | mg/L | annual | 220 | U. Olentangy WRC 901; 66 obs., 2011-16 |
| *pH* | S.U. | summer | 7.96 | U. Olentangy WRC 901; 21 obs., 2011-16 |
| | | winter | 8.22 | U. Olentangy WRC 901; 17 obs., 2011-16 |
| *Temperature* | ºC | summer | 24 | U. Olentangy WRC 901; 21 obs., 2011-16 |
| | | winter | 6 | U. Olentangy WRC 901; 17 obs., 2011-16 |
| *Delaware UOWRC flow* | cfs | annual | 15.472 | 2015 NPDES Permit Renewal Application |
| *Background Water Quality* | | | | |
| Aldrin | µg/L | | 0 | No representative data available. |
| Aluminum | µg/L | | 565 | V04G22; 1999-2003; n=17; 0<MDL; |
| Ammonia (Summer) | mg/L | | 0 | 4PD4-801; 2011-2016; n=21; 16<MDL; |
| Ammonia (Winter) | mg/L | | 0.14 | 4PD4-801; 2011-2016; n=17; 5<MDL; |
| Antimony | µg/L | | 0 | No representative data available. |
| Arsenic - TR | µg/L | | 2.6 | V04G22; 1999-2003; n=17; 5<MDL; |
| Barium | µg/L | | 63 | V04G22; 1999-2003; n=17; 0<MDL; |
| Beryllium | µg/L | | 0 | No representative data available. |
| Bis (2-chloroethyl) ether | µg/L | | 0 | No representative data available. |
| Bis (2-ethylhexyl) phthalate | µg/L | | 0 | No representative data available. |
| Cadmium - TR | µg/L | | 0 | V04G22; 1999-2003; n=17; 17<MDL; |
| Chlorides | mg/L | | 35 | V04G22; 1999-2003; n=17; 0<MDL; |
| Chromium - TR | µg/L | | 0 | V04G22; 1999-2003; n=17; 17<MDL; |
| Hexavalent Chromium | µg/L | | 0 | No representative data available. |
| Copper - TR | µg/L | | 0 | V04G22; 1999-2003; n=17; 17<MDL; |
| Cyanide, Free | mg/L | | 0 | No representative data available. |
| 1,4-Dichlorobenzene | µg/L | | 0 | No representative data available. |
| Dieldrin (BCC) | µg/L | | 0 | No representative data available. |
| Dissolved Solids | mg/L | | 300 | V04G22; 1999-2003; n=17; 0<MDL; |
| Iron - TR | µg/L | | 730 | V04G22; 1999-2003; n=17; 0<MDL; |
| Lead - TR | µg/L | | 1 | V04G22; 1999-2003; n=17; 16<MDL; |
| Lindane | µg/L | | 0 | No representative data available. |
| Manganese - TR | µg/L | | 99 | V04G22; 1999-2003; n=17; 0<MDL; |
| Mercury | ng/L | | 0 | No representative data available. |
| Nickel - TR | µg/L | | 0 | V04G22; 1999-2003; n=17; 17<MDL; |
| Selenium - TR | µg/L | | 0 | V04G22; 1999-2003; n=17; 17<MDL; |
| Silver | µg/L | | 0 | No representative data available. |
| Strontium | µg/L | | 838 | V04G22; 1999-2003; n=17; 0<MDL; |
| Thallium | µg/L | | 0 | No representative data available. |
| Zinc - TR | µg/L | | 5 | V04G22; 1999-2003; n=17; 12<MDL; |

**Table 13. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria**

| | | Outside Mixing Zone Criteria | | | | Inside Mixing Zone |
|---|---|---|---|---|---|---|
| | | | Average | | Maximum | |
| Parameter | Units | Human Health | Agri-culture | Aquatic Life | Aquatic Life | Maximum |
| Aldrin | µg/L | 0.0051 | -- | -- | -- | -- |
| Aluminum | µg/L | -- | -- | -- | -- | -- |
| Ammonia (Summer) | mg/L | -- | -- | 1.28 | -- | -- |
| Ammonia (Winter) | mg/L | -- | -- | 2.83 | -- | -- |
| Antimony | µg/L | 15695 | -- | 190 | 900 | 1800 |
| Arsenic - TR | µg/L | -- | 358 | 150 | 340 | 680 |
| Barium | µg/L | -- | -- | 220 | 2000 | 4000 |
| Beryllium | µg/L | 1022 | 365 | 39 | 330 | 660 |
| Bis (2-chloroethyl) ether | µg/L | 51 | -- | -- | -- | -- |
| Bis (2-ethylhexyl) phthalate | µg/L | 215 | -- | 8.4 | 1100 | 2100 |
| Cadmium - TR | µg/L | -- | 182 | 4.6 | 11 | 22 |
| Chlorides | mg/L | -- | -- | -- | -- | -- |
| Chromium - TR | µg/L | -- | 365 | 160 | 3400 | 6900 |
| Hexavalent Chromium (Diss.) | µg/L | -- | -- | 11 | 16 | 31 |
| Copper - TR | µg/L | 4745 | 1825 | 18 | 29 | 59 |
| Cyanide, Free | mg/L | 803 | -- | 0.012 | 0.046 | 0.092 |
| 1,4-Dichlorobenzene | µg/L | 9490 | -- | 9.4 | 57 | 110 |
| Dieldrin (BCC) | µg/L | 0.0014 | -- | 0.056 | 0.24 | 0.47 |
| Dissolved Solids | mg/L | -- | -- | 1500 | -- | -- |
| Iron - TR | µg/L | -- | 16315 | -- | -- | -- |
| Lead - TR | µg/L | -- | 362 | 18 | 330 | 670 |
| Lindane | µg/L | 2.3 | -- | 0.057 | 0.95 | 1.9 |
| Manganese - TR | µg/L | -- | -- | -- | -- | -- |
| Mercury | ng/L | 12 | 10000 | 910 | 1700 | 3400 |
| Nickel - TR | µg/L | 16790 | 730 | 100 | 910 | 1800 |
| Selenium - TR | µg/L | 40149 | 182 | 5 | -- | -- |
| Silver | µg/L | -- | -- | 1.3 | 6.2 | 12 |
| Strontium | µg/L | -- | -- | 21000 | 40000 | 81000 |
| Thallium | µg/L | 23 | -- | 17 | 79 | 160 |
| Zinc - TR | µg/L | 251833 | 91235 | 230 | 230 | 470 |

**Table 14. Parameter Risk Assessment**

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

| | | |
|---|---|---|
| Aluminum | Chlorides | Manganese - TR |

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

| | | |
|---|---|---|
| Antimony | Arsenic - TR | Barium |
| Beryllium | Bis(2-chloroethyl) ether | Cadmium - TR |
| Chromium - TR | Hexavalent Chromium | 1,4-Dichlorobenzene |
| Iron - TR | Lead - TR | Nickel - TR |
| Silver | Thallium | Zinc - TR |

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

| | | |
|---|---|---|
| Bis(2-ethylhexyl) phthalate | Dissolved Solids | Selenium - TR |

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

| | | |
|---|---|---|
| Cyanide, Free | Mercury | Strontium |

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 75and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

| | | *Recommended Effluent Limits* | |
|---|---|---|---|
| *Parameter* | *Units* | *Average* | *Maximum* |
| Aldrin | µg/L | 0.0051 | -- |
| Ammonia (Winter) | mg/L | 2.8 | -- |
| Copper - TR | µg/L | 18 | 29 |
| Dieldrin (BCC) | µg/L | 0.0014 | 0.24 |
| Lindane | µg/L | 0.057 | 0.95 |

Copper - TR becomes a Group 5 parameter based upon the loading test [OAC 3745-2-06(B)].

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

**Table 15. Final Effluent Limits for Outfall 001**

| | | Concentration | | Loading (kg/day)[a] | | |
|---|---|---|---|---|---|---|
| | | 30 Day | Daily | 30 Day | Daily | |
| Parameter | Units | Average | Maximum | Average | Maximum | Basis[b] |
| Water Temperature | °C | - - - - - - - - - - | Monitor | - - - - - - - - - - | | M[c] |
| Flow Rate | MGD | - - - - - - - - - - | Monitor | - - - - - - - - - - | | M[c] |
| Dissolved Oxygen | mg/l | -- | 7.0[e] | -- | -- | PD |
| Total Suspended Solids | | | | | | |
| Summer | mg/l | 14 | 21[d] | 530 | 795[d] | PD |
| Winter | mg/l | 25 | 37[d] | 1401 | 946[d] | PD |
| Oil & Grease | mg/l | -- | 10 | -- | -- | WQS |
| Ammonia | | | | | | |
| Summer | mg/l | 0.75 | 1.12[d] | 42 | 28[d] | PD |
| Winter | mg/l | 2.83 | 4.25[d] | 107 | 161[d] | RP/WLA |
| Total Kjeldahl Nitrogen | mg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | BTJ |
| Phosphorus | mg/l | 1.0 | 1.5[d] | 38 | 57[d] | PD |
| Orthophosphate, Dissolved (as P) | mg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | SB1 |
| Total Inorganic Nitrogen | | | | | | |
| Summer | mg/l | 6.3 | 9.5[d] | 238 | 358[d] | PD |
| Winter | mg/l | 8.1 | 12.2[d] | 307 | 460[d] | PD |
| Cyanide, Free | µg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | RP |
| Nickel, Total Recoverable | µg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | M[c] |
| Strontium, Total Recoverable | µg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | RP |
| Zinc, Total Recoverable | µg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | M[c] |
| Cadmium, Total Recoverable | µg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | M[c] |
| Lead, Total Recoverable | µg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | M[c] |
| Chromium, Total Recoverable | µg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | M[c] |
| Copper, Total Recoverable | µg/l | 18 | 29 | 1.1 | 0.68 | RP/WLA |
| Hexavalent Chromium (Diss.) | µg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | M[c] |
| *E. coli* | #/100 ml | 126 | 284[d] | -- | -- | WQS |
| Lindane | µg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | RP |
| Mercury, Total (Low Level) | ng/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | RP |
| Acute Toxicity | | | | | | |
| *Ceriodaphnia dubia* | $TU_a$ | - - - - - - - - - - | Monitor | - - - - - - - - - - | | WET |
| *Pimephales promelas* | $TU_a$ | - - - - - - - - - - | Monitor | - - - - - - - - - - | | WET |
| Chronic Toxicity | | | | | | |
| *Ceriodaphnia dubia* | $TU_c$ | - - - - - - - - - - | Monitor | - - - - - - - - - - | | WET |
| *Pimephales promelas* | $TU_c$ | - - - - - - - - - - | Monitor | - - - - - - - - - - | | WET |
| pH, Maximum | SU | | 9.0 | | | WQS |
| pH, Minimum | SU | | 6.5[e] | | | WQS |
| Residue, Total Filterable | mg/l | - - - - - - - - - - | Monitor | - - - - - - - - - - | | M[c] |
| CBOD, 5-Day | | | | | | |
| Summer | mg/l | 10 | 15[d] | 379 | 568[d] | PD |
| Winter | mg/l | 18 | 27[d] | 681 | 1022[d] | PD |

**FOOTNOTES**

[a] Effluent loadings based on average design discharge flow of 10.0 MGD.

[b] Definitions:

BTJ = Best Technical Judgment
CFR = Code of Federal Regulations
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
NPDES = National Pollutant Discharge Elimination System
OAC = Ohio Administrative Code
PD = Plant Design (OAC 3745-33-05(E))
RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in permits (OAC 3745-33-07(A))
SB1 = Implementation of Senate Bill 1 (ORC 6111.03)
WET = Minimum testing requirements for whole effluent toxicity [OAC 3745-33-07(B)(11)]
WLA = Wasteload Allocation procedures (OAC 3745-2)
WQS = Ohio Water Quality Standards (OAC 3745-1)

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] 7 day average limit.
[e] Effluent minimum

**Addendum 1. Acronyms**

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