

National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for Chillicothe Correctional Institute Wastewater Treatment Plant (WWTP)

Public Notice No.: 14-03-048
Public Notice Date: March 26, 2014
Comment Period Ends: April 25, 2014

Ohio EPA Permit No.: OPP00050*FD
Application No.: OH0076490

Name and Address of Applicant:

Ohio Department of Rehabilitation & Corrections
Chillicothe Correctional Institute
P.O. Box 5500
Chillicothe, Ohio 45601

Name and Address of Facility Where

Discharge Occurs:

Ohio Department of Rehabilitation & Corrections
Chillicothe Correctional Institute
15802 State Route 104 North
Chillicothe, Ohio 45601
Ross County

Receiving Water: Scioto River

Subsequent
Stream Network: 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.

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 EPA (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

Most of the effluent limits and monitoring requirements proposed in this permit are the same as in the current permit, although some monitoring frequencies have changed.

Limits for free cyanide and mercury are proposed to be removed due to a lack of reasonable potential to exceed WQS. However, tracking language is included for mercury.

New monitoring for total filterable residue (dissolved solids) is proposed to in order to collect data for the upcoming Total Daily Maximum Load (TMDL) report.

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

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

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; WET testing; a dissolved metal translator (DMT) study; tracking of group 4 parameters; 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 Sara Hise, (614) 644-4824, Sara.Hise@epa.ohio.gov.

Information Regarding Certain Water Quality Based Effluent Limits

This draft permit may contain proposed water quality based effluent limitations 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 Section 6111.03(J)(3), the Director established these water quality based effluent limits (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 Chillicothe Correctional Institute (CCI) WWTP discharges to the Scioto River at River Mile (RM) 72.4. Figure 1 shows the approximate location of the CCI, the Ross Correctional Institute, and the CCI WWTP.

This segment of the Scioto River is described by Ohio EPA River Code: 02-001, U.S. EPA River Reach #: 05060002, County: Ross, Ecoregion: Western Allegheny Plateau. The Scioto River is designated for the following uses under Ohio's WQS (OAC 3745-1-09): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Class A Primary Contact Recreation (PCR).

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 (PCR) and wading only (Secondary Contact - generally waters too shallow for swimming or canoeing).

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

Facility Description

CCI WWTP is owned and operated by the Ohio Department of Rehabilitation and Corrections. The facility also serves the Ross Correctional Institute, the Chillicothe Veterans Administration Hospital, and the Unioto School District. The CCI WWTP has an average design flow of 4.4 million gallons per day (MGD). The WWTP was constructed in 1960 and last upgraded in 2005. Treatment processes include screening, grit and scum removal, flow equalization, primary clarification, activated sludge, secondary clarification, and ultraviolet disinfection.

Description of Existing Discharge

The treated effluent discharges through outfall 001. Outfall 002 was the former coal pile runoff area and received flow from the water treatment plant backwash. The facility has routed flow from outfall 002 to the WWTP. Outfall 002 will be removed from the permit.

Table 1 presents chemical specific data collected by Ohio EPA.

Table 2 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 001. Data are presented for the period of July 2008 to June 2013, and current permit limits are provided for comparison.

Table 3 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Tables 4 and 5 summarize the results of acute WET tests of the final effluent.

Assessment of Impact on Receiving Waters

The Scioto River was surveyed and assessed in 2011. The river was in full attainment. Extensive biological, physical habitat, and chemical water quality monitoring was conducted in 2011 at sites in the lower Scioto River basin (downstream Big Darby Creek to the Ohio River excluding the Deer Creek, Paint Creek, Salt Creek, and Scioto Brush Creek subbasins). Compilation of the Technical Support Document (TSD) and development of TMDLs for pollutants impairing designated or recommended aquatic life uses are underway. Status of reports and analyses can be accessed via the Scioto River (lower) tab at: <http://epa.ohio.gov/dsw/tmdl/SciotoRiver.aspx>.

Development of Water-Quality-Based Effluent Limits

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

Parameter Selection

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

Self-monitoring data (DMR)	July 2008 through June 2013
Ohio EPA compliance sampling data	February 2013

Outliers

The data were examined, and no values were removed from the evaluation to give a more reliable PEQ.

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

Allocations are developed using a percentage of stream design flow as specified in Table 7, 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 12 ng/L (average) and 1700 ng/L (maximum) in the Ohio River basin.

The data used in the WLA are listed in Tables 6 and 7. The WLA results to maintain all applicable criteria are presented in Table 8. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

Dissolved Metals Translators

A DMT is the factor used to convert a dissolved metal aquatic life criterion to an effective total recoverable aquatic life criterion with which a total recoverable aquatic life allocation can be calculated as required by NPDES permit rules [OAC Rule 3745-33-05(C)(2)]. Currently, a DMT is based on site- or area-specific field data; each field data sample consists of a total recoverable measurement paired with a dissolved metal measurement.

For the Scioto River, there were five such paired samples available applicable to cadmium, chromium, copper, lead, nickel, and zinc. To account for the limited quantity of data, the DMT for each of these metals was determined as the lower end of the 95 percent confidence interval (1-tail) about the geometric mean of the total recoverable-to-dissolved ratios of the sample pairs. Each DMT is metal-specific and is applied by multiplying the dissolved criteria by the DMT, resulting in total effective recoverable criteria which are used in the WLA procedures.

In some cases, it is possible that the use of a DMT may result in instream concentrations of metals that may increase the risk of non-attainment of the aquatic life use designation. This was evaluated for the CCI WWTP. The DMT was not used for cadmium, zinc, or nickel because the translator was less than 1.0; the total recoverable criteria was used for these metals.

The Scioto River near the CCI WWTP is currently categorized as full attainment status. CCI has not requested any increase in permitted load. Therefore, the facility can receive permit limits that maintain all numeric criteria, up to their current limits, without undergoing any further review to ensure that the limits for the metals will protect the aquatic life and other uses. The facility will need to submit an updated DMT study with the next permit renewal if they want to continue to use DMTs.

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). 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 CCI WWTP, the WLA values are 8.7 TU_a and 30.46 TU_c . The acute value defaults to 1.0 TU_a in accordance with OAC 3745-2-09.

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):

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

The acute toxicity unit (TU_a) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life (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.

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 8. 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 [$(PEQ_{avg} \div PEL_{avg}) \times 100$, or $(PEQ_{max} \div PEL_{max}) \times 100$], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 9.

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 outfall 001 and the basis for their recommendation.

Water Temperature and Flow Rate

Monitoring for these parameters is proposed to continue in order to evaluate the facility's effluent quality.

Oil & Grease and pH

Limits are based on WQS and are proposed to continue.

Total Suspended Solids, Ammonia, Dissolved Oxygen, and Carbonaceous Biochemical Oxygen Demand (5 day)
Limits for these parameters are based on plant design and are proposed to continue.

E. coli

New WQS for *E. coli* became effective in March 2010. The facility utilizes ultraviolet disinfection; therefore, no compliance schedule to meet the new limits is proposed.

Nitrate+Nitrite, Total Kjeldahl Nitrogen, and Phosphorus

Monitoring for these parameters is proposed to continue. The purpose of the monitoring is to maintain a nutrient data set for use in the TMDL study and future implementation.

Total Filterable Residue

Based on BPJ, monitoring is proposed for total filterable residue (dissolved solids). No effluent data is available for this parameter, which is an emerging water quality issue for WWTPs. The purpose of the monitoring is to obtain data on the level and variability of total filterable residue in the CCI WWTP effluent.

Barium, Manganese, and Strontium

The Ohio EPA risk assessment (Table 9) places these parameters 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. No monitoring is proposed.

Cadmium, Chromium, Hexavalent Chromium (dissolved), Free Cyanide, Nickel, Lead, and Zinc

The Ohio EPA risk assessment (Table 9) places these parameters in groups 2 and 3. This placement, as well as the data in Tables 1, 2, and 3, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at a low frequency is proposed to document that these pollutants continue to remain at low levels.

Copper

The Ohio EPA risk assessment (Table 9) places this parameter 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).

Mercury

The Ohio EPA risk assessment (Table 9) places this parameter 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). Limits are proposed to be removed.

However, mercury effluent quality falls within 75 percent of the WLA. Under OAC 3745-33-07(A)(2), parameters in this range must have a tracking requirement in the permit that specifies reductions in pollutant concentrations if effluent concentrations exceed the WLA. The tracking/reduction requirements are included in Part II of the draft permit. The monitoring frequency is proposed to be increased.

Whole Effluent Toxicity Reasonable Potential

Annual acute toxicity monitoring is proposed for the life of the permit. Evaluating the toxicity data presented in Tables 4 and 5 and other pertinent data under the provisions of OAC 3745-33-07(B) placed the CCI WWTP 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). The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Sludge

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

Additional Monitoring

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.

Other Requirements

Dissolved Metal Translator Study

In order to continue using DMTs, the permittee needs to perform a new DMT study. The requirements for the study are detailed in Part II of the draft permit.

Sanitary Sewer Overflow Reporting

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

Operator Certification and Operator of Record

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

Storm Water Compliance

Parts IV, V, and VI have been included with the draft permit in order 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 CCI may seek permit coverage under the general permit for industrial stormwater (permit # OHR000005) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the CCI submits a Notice of Intent (NOI) for coverage under the general permit for industrial stormwater 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.

Parts IV, V, and VI have been updated to make individual permits consistent with Ohio EPA's Industrial Storm Water General Permit.

Outfall Signage

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

Figure 1. Approximate Facility Location



Table 1. Effluent Characterization Using Ohio EPA Data

Parameter (2/12/13)	Result	Units
Aluminum	AA (200)	µg/L
Ammonia	0.06	mg/L
Arsenic	AA (2)	µg/L
Barium	95	µg/L
Cadmium	AA (0.2)	µg/L
Carbonaceous Biochemical Oxygen Demand (5 day)	AA (2)	mg/L
Chloride	131	mg/L
Chromium	AA (2)	µg/L
COD	AA (20)	mg/L
Copper	6	µg/L
Cyanide, Free	AA (5)	µg/L
Iron	68	µg/L
Lead	AA (2)	µg/L
Magnesium	32	mg/L
Manganese	36	µg/L
Nickel	2.7	µg/L
Nitrate+Nitrite	17.6	mg/L
Oil & grease	AA (2)	mg/L
Phenolics	AA (10)	µg/L
Phosphorus	1.87	mg/L
Selenium	AA (2)	µg/L
Strontium	508	µg/L
Total Filterable Residue (Dissolved Solids)	710	mg/L
Total Kjeldahl Nitrogen	0.92	mg/L
Total Suspended Solids	AA (5)	mg/L
Zinc	15	µg/L

AA = not detected (reporting limit)

Table 2. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
<u>Outfall 001</u>								
Water Temperature	Annual	°C	Monitor		1823	20	25	12-27
Dissolved Oxygen	Summer	mg/L	6.0 minimum		919	7.8	8.7	5-11.3
Dissolved Oxygen	Winter	mg/L	6.0 minimum		904	8.5	9.2	6-10.7
Total Suspended Solids	Annual	mg/L	12	18 ^a	821	4	12	0-58
Total Suspended Solids	Annual	kg/day	200	300 ^a	821	-	-	-
Oil and Grease	Annual	mg/L	10 maximum		143	0	0	0-3.3
Oil and Grease	Annual	kg/day	-	167	143	-	-	-
Ammonia	Annual	mg/L	1.0	2.0 ^a	822	0	0.11	0-1.8
Ammonia	Annual	kg/day	16.7	33.3 ^a	822	-	-	-
Total Kjeldahl Nitrogen	Annual	mg/L	Monitor		60	1.13	2.11	0-10.6
Nitrite + Nitrate	Annual	mg/L	Monitor		92	15.1	18.4	0-24.4
Phosphorus	Annual	mg/L	Monitor		60	1.7	2.26	1.17-2.61
Cyanide, Free	Annual	mg/L	0.092 maximum		60	0	0	0-0.01
Nickel	Annual	µg/L	Monitor		60	0	11.9	0-44
Zinc	Annual	µg/L	Monitor		60	21.8	82.1	0-165
Cadmium	Annual	µg/L	Monitor		60	0	0	0-0
Lead	Annual	µg/L	Monitor		60	0	0	0-20
Chromium	Annual	µg/L	Monitor		60	0	0	0-10
Copper	Annual	µg/L	Monitor		60	14	53.2	0-116
Chromium, Dissolved Hexavalent	Annual	µg/L	Monitor		60	0	0	0-0
Fecal Coliform	Annual	#/100 mL	1000	2000 ^a	366	33	900	0-32000
Flow Rate	Annual	MGD	Monitor		1811	1.28	1.68	0.418-159
Mercury	Annual	ng/L	12	1700	10	2.34	7.09	0-8.6
Mercury	Annual	kg/day	0.00019	0.028	10	-	-	-

Table 2. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
Acute Toxicity, <i>Ceriodaphnia dubia</i>	Annual	TU _a	Monitor		5	0	0.08	0-0.1
Acute Toxicity, <i>Pimephales promelas</i>	Annual	TU _a	Monitor		5	0	8.02	0-10
pH, Maximum	Annual	S.U.	9.0 maximum		1823	7.8	8.1	6.6-8.7
pH, Minimum	Annual	S.U.	6.5 minimum		1823	7.7	8.1	6.6-8.8
Carbonaceous Biochemical Oxygen Demand (5 day)	Summer	mg/L	10	15 ^a	370	0	4	0-13
Carbonaceous Biochemical Oxygen Demand (5 day)	Winter	mg/L	10	15 ^a	363	1.1	6	0-18
Carbonaceous Biochemical Oxygen Demand (5 day)	Annual	kg/day	167	250 ^a	733	-	-	-
<u>Outfall 002</u>								
pH	Annual	S.U.	6.5 - 9.0		26	7.8	8.6	7.6-8.9
Total Suspended Solids	Annual	mg/L	50 maximum		26	13.5	26.5	1-46
Flow Rate	Annual	MGD	Monitor		215	0.166	0.313	0.0153-0.323
<u>Station 300</u>								
Overflow Occurrence	Annual	No./Month	Monitor		0	0	0	0
<u>Station 581</u>								
Ammonia	Annual	mg/kg	Monitor		4	99	5280	42-6190
Total Kjeldahl Nitrogen	Annual	mg/kg	Monitor		4	23400	47300	3800-50000
Arsenic	Annual	mg/kg	75 maximum		4	39	49.2	36-51
Cadmium	Annual	mg/kg	85 maximum		4	1.52	3.89	0-4.22
Copper	Annual	mg/kg	4300 maximum		4	624	948	478-984

Table 2. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
Lead	Annual	mg/kg	840 maximum		4	34.9	70.5	15-73.5
Nickel	Annual	mg/kg	420 maximum		4	17.6	26.6	16-28.1
Zinc	Annual	mg/kg	7500 maximum		4	659	1100	567-1160
Selenium	Annual	mg/kg	100 maximum		4	3.95	8.91	0-9.6
Fecal Coliform	Annual	MPN/G	2000000 maximum		4	16900	1190000	0-1390000
Sludge Fee Weight	Annual	dry tons	Monitor		4	112	175	84.3-184
Sludge Weight	Annual	dry tons	Monitor		4	112	175	84.3-184
Mercury	Annual	mg/kg	57 maximum		4	1.58	2.46	0.34-2.5
Molybdenum	Annual	mg/kg	75 maximum		4	11.5	14.1	10.2-14.5
<u>Internal Monitoring Station 601</u>								
pH	Annual	S.U.	Monitor		1826	7.9	8.2	5.9-9.1
Total Suspended Solids	Annual	mg/L	Monitor		821	112	480	0-3970
Carbonaceous Biochemical Oxygen Demand (5 day)	Summer	mg/L	Monitor		369	67.4	134	6-722
Carbonaceous Biochemical Oxygen Demand (5 day)	Winter	mg/L	Monitor		362	86	150	4.3-630
<u>Monitoring Station 801</u>								
48-Hr. Acute Toxicity, <i>Ceriodaphnia dubia</i>	Annual	% Affected	Monitor		5	0	0.0008	0-0.001
96-Hr. Acute Toxicity, <i>Pimephales promelas</i>	Annual	% Affected	Monitor		5	0	9	0-10
<u>Monitoring Station 901</u>								
Total Hardness	Annual	mg/L	Monitor		60	285	339	146-400

Table 2. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
48-Hr. Acute Toxicity, <i>Ceriodaphnia dubia</i>	Annual	% Affected	Monitor		5	0	0.0008	0-0.001
96-Hr. Acute Toxicity, <i>Pimephales promelas</i>	Annual	% Affected	Monitor		5	0	5	0-5

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

Table 3. Projected Effluent Quality Values for Outfall 001

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Ammonia (Summer)	mg/L	223	46	0.11226	0.1992
Ammonia (Winter)	mg/L	143	30	0.2336	0.32
Barium	µg/L	1	1	429.97	589
Cadmium	µg/L	51	0	--	--
Chromium	µg/L	49	1	7.3	10
Chromium, Dissolved Hexavalent	µg/L	50	0	--	--
Copper	µg/L	51	41	33.507	51.532
Cyanide, Free	mg/L	40	2	0.00803	0.011
Lead	µg/L	48	1	16.06	22
Manganese	µg/L	1	1	162.936	223.2
Mercury	ng/L	9	8	11.3004	15.48
Nickel	µg/L	51	6	32.12	44
Nitrate + Nitrite	mg/L	51	50	17.812	24.4
Phosphorus	mg/L	51	51	1.9263	2.2355
Strontium	µg/L	1	1	2299.208	3149.6
Total Kjeldahl Nitrogen	mg/L	51	37	2.4823	3.8785
Zinc	µg/L	51	50	63.838	99.612

MDL = method detection limit
PEQ = projected effluent quality

Table 4. Summary of Ohio EPA Bioassay Acute Toxicity Results

Collection Date	<i>Ceriodaphnia dubia</i>								<i>Pimephales promelas</i>							
	24 Hours				48 Hours				24 Hours				48 Hours			
	UP	C	%M	TU _a	UP	C	%M	TU _a	UP	C	%M	TU _a	UP	C	%M	TU _a
2/11/2013	0	0	5	ND	0	0	5	ND	0	0	0	ND	0	0	0	ND
2/12/2013	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND
2/11/13-2/12/13 ^a	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND

^a = 24-hour composite sample

C = laboratory control water

%M = percent mortality in 100% effluent

ND = not determined

TU_a = acute toxicity units

UP = percent mortality in upstream control water

Table 5. Summary of Chillicothe Correctional Institute Acute Toxicity Results

	<i>Ceriodaphnia Dubia</i>	<i>Pimephales promelas</i>
Date	Acute Toxicity (TU _a)	Acute Toxicity (TU _a)
9/3/2008	AA	AA
9/8/2009	AA	AA
9/15/2010	0.1	0.1
9/27/2011	AA	AA
9/27/2012	AA	0.2

AA = not detected (detection limit of 0.1 TU_a)

Table 6. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Ammonia (Summer)	mg/L	--	--	1.1	--	--
Ammonia (Winter)	mg/L	--	--	1.9	--	--
Barium	µg/L	--	--	220	2000	4000
Cadmium	µg/L	--	50	5.6	15	29
Chromium	µg/L	--	100	190	1500	2900
Chromium, Dissolved Hexavalent	µg/L	--	--	11	16	31
Copper	µg/L	1300	500	23	37	74
Cyanide, Free	mg/L	220	--	0.012	0.046	0.092
Lead	µg/L	--	100	55	1100	2100
Manganese	µg/L	--	--	--	--	--
Mercury	ng/L	12	10000	910	1700	3400
Nickel	µg/L	4600	200	130	1100	2300
Nitrate + Nitrite	mg/L	--	100	--	--	--
Phosphorus	mg/L	--	--	--	--	--
Strontium	µg/L	--	--	21000	40000	81000
Total Kjeldahl Nitrogen	mg/L	--	--	--	--	--
Zinc	µg/L	69000	25000	290	290	580

Table 7. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
<i>Stream Flows</i>				
1Q10	cfs	annual	205	USGS 03231500
7Q10	cfs	annual	215	USGS 03231500
30Q10	cfs	summer	242	USGS 03231500
	cfs	winter	428	USGS 03231500
Harmonic Mean	cfs	annual	921	USGS 03231500
Mixing Assumption	%	average	93.3	
	%	maximum	93.3	
<i>Hardness</i>				
	mg/l	annual	285	Station 901; n=50
<i>pH</i>				
	S.U.	summer	8	BWQR; Scioto River, n=402
		winter	8.3	BWQR; Scioto River, n=24
<i>Temperature</i>				
	C	summer	22.8	BWQR; Scioto River, n=637
		winter	5	BWQR; Scioto River, n=200
<i>Ross Correctional Institute flow</i>				
	cfs	annual	6.81	NPDES application ADF
<i>Background Water Quality</i>				
Ammonia (Summer)	mg/L		0.03	Ohio EPA; 2011; n=6; 1<MDL; Station 301543
Ammonia (Winter)	mg/L		0	No representative data available.
Barium	µg/L		70.5	Ohio EPA; 2011; n=6; 0<MDL; Station 301543
Cadmium	µg/L		0.14	Ohio EPA; 2011; n=6; 5<MDL; Station 301543
Chromium	µg/L		1.47	Ohio EPA; 2011; n=6; 5<MDL; Station 301543
Chromium, Dissolved Hexavalent	µg/L		0	No representative data available.
Copper	µg/L		4.73	Ohio EPA; 2011; n=6; 0<MDL; Station 301543
Cyanide, Free	mg/L		0	No representative data available.
Lead	µg/L		2.85	Ohio EPA; 2011; n=6; 3<MDL; Station 301543
Manganese	µg/L		0	No representative data available.
Mercury	ng/L		0	No representative data available.
Nickel	µg/L		5.03	Ohio EPA; 2011; n=6; 0<MDL; Station 301543
Nitrate + Nitrite	mg/L		2.22	Ohio EPA; 2011; n=6; 0<MDL; Station 301543
Phosphorus	mg/L		0.24	Ohio EPA; 2011; n=6; 0<MDL; Station 301543
Strontium	µg/L		1095	Ohio EPA; 2011; n=6; 0<MDL; Station 301543
Total Kjeldahl Nitrogen	mg/L		0.72	Ohio EPA; 2011; n=6; 0<MDL; Station 301543
Zinc	µg/L		21	Ohio EPA; 2011; n=6; 2<MDL; Station 301543

ADF = average design flow

BWQR = *Analysis of Unimpacted Stream Data for the State of Ohio*, Ohio EPA, 1988.

NPDES = National Pollutant Discharge Elimination System

Ohio EPA = Ohio Environmental Protection Agency

USGS = United States Geological Survey

Table 8. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Ammonia (Summer)	mg/L	--	--	--	--	--
Ammonia (Winter)	mg/L	--	--	--	--	--
Barium	µg/L	--	--	4625	56206	4000
Cadmium	µg/L	--	6343	167	433	29
Chromium	µg/L	--	12536	5745	43599	2900
Chromium, Dissolved Hexavalent	µg/L	--	--	335	465	31
Copper	µg/L	164782	63010	561	943	74
Cyanide, Free	mg/L	27987	--	0.37	1.3	0.092
Lead	µg/L	--	12362	1592	31923	2100
Manganese	µg/L	--	--	--	--	--
Mercury	ng/L	12	10000	910	1700	3400
Nickel	µg/L	584554	24808	3812	31861	2300
Nitrate + Nitrite	mg/L	--	12442	--	--	--
Phosphorus	mg/L	--	--	--	--	--
Strontium	µg/L	--	--	607489	1132986	81000
Total Kjeldahl Nitrogen	mg/L	--	--	--	--	--
Zinc	µg/L	8775193	3177728	8216	7847	580

Table 9. Parameter Assessment for Outfall 001

<i>Group 1:</i>	Due to a lack of criteria, the following parameters could not be evaluated at this time.		
	Manganese	Total Kjeldahl Nitrogen	Phosphorus
<i>Group 2:</i>	PEQ < 25 percent of WQS or all data below minimum detection limit. WLA not required. No limit recommended; monitoring optional.		
	Cadmium	Chromium	Nickel
	Chromium ⁺⁶	Nitrate + Nitrite	Strontium
<i>Group 3:</i>	PEQ _{max} < 50 percent of maximum PEL and PEQ _{avg} < 50 percent of average PEL. No limit recommended; monitoring optional.		
	Barium	Cyanide, Free	Lead
	Zinc		
<i>Group 4:</i>	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	Mercury ^a	
<i>Group 5:</i>	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>Period</u>	<u>Recommended Effluent Limits</u>	
			<u>Average</u>	<u>Maximum</u>

No parameters meet these criteria.

^a = Mercury requires a permit tracking requirement in accordance with OAC 3745-33-07(A)(2) since the PEQ is > or = 75 percent of the PEL.

OAC = Ohio Administrative Code

PEL = preliminary effluent limit

PEQ = projected effluent quality

WLA = wasteload allocation

WQS = water quality standard

Table 10. Final Effluent Limits for Outfall 001

Parameter	Units	Concentration		Loading (kg/day) ^a		Basis ^b
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Water Temperature	C	----- Monitor -----				M ^c
Dissolved Oxygen	mg/L	6.0 minimum		--	--	EP/PD
Total Suspended Solids	mg/L	12	18 ^d	200	300 ^d	EP/PD
Oil & Grease	mg/L	--	10	--	167	WQS
Ammonia	mg/L	1.0	2.0 ^d	16.7	33.3 ^d	EP/PD
Total Kjeldahl Nitrogen	mg/L	----- Monitor -----				EP
Nitrate+Nitrite	mg/L	----- Monitor -----				EP
Phosphorus	mg/L	----- Monitor -----				EP
Total Filterable Residue	mg/L	----- Monitor -----				BPJ
Cyanide, Free	mg/L	----- Monitor -----				EP
Nickel	µg/L	----- Monitor -----				EP
Zinc	µg/L	----- Monitor -----				EP
Cadmium	µg/L	----- Monitor -----				EP
Lead	µg/L	----- Monitor -----				EP
Chromium	µg/L	----- Monitor -----				EP
Copper	µg/L	----- Monitor -----				RP
Chromium, Dissolved Hexavalent	µg/L	----- Monitor -----				EP
<i>E. coli</i>	#/100 mL	126	284 ^d	-	-	WQS
Flow rate	MGD	----- Monitor -----				M ^c
Mercury	ng/L	----- Monitor -----				RP
Acute Toxicity						
<i>Ceriodaphnia dubia</i>	TUa	----- Monitor -----				WET
<i>Pimephales promelas</i>	TUa	----- Monitor -----				WET
pH	SU	6.5 - 9.0		-	-	WQS
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	10	15 ^d	167	250 ^d	EP/PD

^a Effluent loadings based on average design discharge flow of 4.4 MGD.

^b Definitions: **BPJ** = Best Professional Judgment
EP = Existing Permit
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
PD = Plant Design
RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (OAC 3745-33-07(A))
WET = Whole Effluent Toxicity (OAC 3745-33-07(B))
WLA = Wasteload Allocation procedures (OAC 3745-2)
WQS = Ohio Water Quality Standards (OAC 3745-1)

- ^c 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.