

National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET (Revised)

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for the **Shawnee No. 2 Wastewater Treatment Works**

Public Notice No.: 15-03-048
Public Notice Date: March 24, 2015
Comment Period Ends: April 24, 2015

Ohio EPA Permit No.: **2PK00002*JD**
Application No.: **OH0023850**

Name and Address of Applicant:

Allen County Board of Commissioners
4140 Diller Rd
Lima, Ohio 45807

Name and Address of Facility Where
Discharge Occurs:

Shawnee #2 Wastewater Treatment Works
3640 Spencerville Road
Lima, Ohio 45805
Allen County

Receiving Water: **Ottawa River**

Subsequent
Stream Network: **Auglaize River**
to Maumee River
to Lake Erie

Introduction

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

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

No antidegradation review was necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the Clean Water Act. 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

The effluent limits and monitoring requirements proposed for the following parameters are the same as in the current permit, although some monitoring frequencies have changed: flow, temperature, dissolved oxygen, 5-day carbonaceous biochemical oxygen demand (CBOD₅), *E. coli*, total suspended solids, ammonia, phosphorus, nitrite+nitrate, total Kjeldahl nitrogen (TKN), oil and grease, pH, chlorine, cadmium, chromium, hexavalent chromium (VI), copper, lead, nickel, total filterable residue (dissolved solids), and zinc.

Shawnee #2 WWTP is currently on schedule to have a new ultraviolet (UV) disinfection system installed by summer 2015, after which the existing chlorination/de-chlorination system will be decommissioned. As such, total residual chlorine monitoring and limits will be removed beginning November 1, 2016.

Shawnee #2 WWTP submitted information supporting the renewal of the mercury variance. A 30-day average mercury effluent limit is proposed based on sampling data submitted by WWTP.

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 American Society for Testing and Materials (ASTM) D7237-10 or OI Analytical (OIA)-1677-09 both of which are approved methods for free cyanide listed in 40 CFR 136. Quarterly monitoring for cyanide is being proposed in order to gather low level data for the pollutant.

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

A secondary treatment bypass will be monitored at station 602. The bypass is a temporary overflow from the EQ basin.

In Part II of the permit, special conditions are included that address sanitary sewer overflow reporting; operator certification, minimum staffing and operator of record; whole effluent toxicity testing; low-level free cyanide testing; storm water compliance; 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 Chris Kosto, (614) 644-2027, christopher.kosto@epa.ohio.gov, or Peggy Christie, (419) 373-3006, peggy.christie@epa.ohio.gov.

Information Regarding Certain Water Quality Based Effluent Limits

This draft permit may contain proposed water quality based effluent limitations (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 water quality based effluent limits 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 Ohio Administrative Code (OAC) Rule 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 Rule 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 Shawnee #2 wastewater treatment plant (WWTP) discharges to the Ottawa River at River Mile (RM) 32.5 in Allen County near the City of Lima. Figure 1 shows the approximate location of the facility.

This segment of the Ottawa River is described by Ohio EPA River Code: 04-200, U.S. EPA River Reach #: 04100007-018, County: Allen, Ecoregion: Eastern Corn Belt Plains (ECBP). Ottawa River is designated for the following uses under Ohio's WQS (Ohio Administrative Code [OAC] 3745-1-11): 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 (Primary Contact) 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 agricultural and industrial water supply.

Facility Description

The Shawnee #2 WWTP is designed to treat an average daily flow of 2.0 million gallons per day (MGD). The treatment plant was originally constructed in 1994. The current treatment plant processes and/or equipment include: bar screen, comminution, sequencing batch reactor, alum addition, chlorination, de-chlorination, and post-aeration. See Figure 2 for a schematic of the treatment works.

Shawnee #2 WWTP is in the process of building a new headworks, after which the bar screen and comminution processes will be replaced by a self-cleaning fine screen. Additional improvements include an equalization (EQ) basin with chemically enhanced primary treatment (CEPT), and a UV disinfection system which will replace the chlorination and de-chlorination processes.

Sludge is processed with aerobic digestion, gravity belt thickening, and ultimately disposed by land application and transfer to another WWTP.

Collection System

The collection system, which serves a population of 9,000 in Shawnee Township, consists of 100 percent separate sanitary sewers. The estimated inflow and infiltration (I/I) rate is 0.5 MGD. The water supply sources for the service area are residential wells and a surface water reservoir.

There are no industrial users which discharge into the collection system, and the County does not operate an industrial pretreatment program for this system.

A secondary treatment bypass is represented by station 602. The bypass is a temporary overflow from the EQ basin.

In 2005, Director's Final Findings and Orders (DFFOs) were issued to address sanitary sewer overflows (SSOs) continuing to occur in the collection system. The permittee submitted a System Evaluation Capacity Assurance Plan (SECAP) to satisfy a requirement of the DFFOs. In January 2014, Modified DFFOs were issued, extending project schedules proposed by the SECAP based on funding and timing constraints. Those projects include the WWTP improvements outlined in the previous section. Improvements to the collection system include a new trunk sewer and pump station. As required by the Modified DFFOs, the temporary overflow from the EQ basin and all SSOs are to be eliminated by December 31, 2020.

Table 2 shows the number of overflow events from SSO stations 003-009 reported from 2009 through 2013.

Description of Existing Discharge

Table 3 shows the annual effluent flow rates for the Shawnee #2 WWTP from 2009 through 2013 based upon Discharge Monitoring Report (DMR) data.

Table 4 presents chemical specific data compiled from the NPDES renewal application, data reported in annual pretreatment reports, and data collected by Ohio EPA.

Table 5 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 001. Data are presented for the period of January 2009 to July 2014, and current permit limits are provided for comparison.

Table 6 summarizes the results of acute and chronic whole effluent toxicity tests of the final effluent.

Table 7 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

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

Assessment of Impact on Receiving Waters

The Ottawa River has been identified as a priority impaired water on Ohio's 303(d) list.

A Total Daily Maximum Load (TMDL) report was approved for the Ottawa River (Lima area) in 11/06/13. The March 24, 2015, Supreme Court of Ohio decision *Fairfield Cty. Bd. of Commrs. v. Nally, Slip Opinion No. 2015-Ohio-991* vacated all previously approved TMDLs. As of April 24, 2015, this TMDL is considered a technical guidance document pending final TMDL approval.

The TMDL is available through the OEPA, Division of Surface Water website at:
http://www.epa.state.oh.us/Portals/35/tmdl/OttawaLima_Report_Final.pdf

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 (IBI) and modified Index of Well-Being (MIwb), which indicate the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community. Numerical criteria are broken down by ecoregion, use designation, and stream or river size. Ohio has five ecoregions defined by common topography, land use, potential vegetation and soil type.

Three attainment status results are possible at each sampling location -full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails to meet the biocriteria. Nonattainment means that either none of the applicable indices meet the biocriteria or one of the organism groups indicates poor or very poor performance. An aquatic life use attainment table (see Table 1) 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 (QHEI), and comments and observations for each sampling location.

The Ottawa River was evaluated by OEPA staff for aquatic life and recreational use potential during the 2010 field season. This assessment included the collection of water chemistry and biological sampling at numerous sites in the mainstem Ottawa River and selected tributaries. A summary of the results from this assessment for the interactive segment covered in this report can be found in Table 1. More information on the 2010 sampling can be found in the OEPA document: "*Biological and Water Quality Study of the Ottawa River and Principal Tributaries, 2010*", OEPA, April 2013. This document is available through the OEPA, Division of Surface Water website at www.epa.state.oh.us/dsw/index.

The area downstream of Shawnee #2 WWTP was listed as in partial attainment. The study concluded there to be organic enrichment partially due to SSOs. This is being addressed by improvements within the collection system and WWTP as required in the previously mentioned DFFOs.

Instream conditions for the Ottawa River, including background water quality data, are summarized in Table 9.

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 Shawnee #2 WWTP discharge is considered to be interactive with the Husky Lima Refinery, PCS Nitrogen and the Lima WWTP. The conservative substance wasteload allocation (CONSWLA) model was used to

distribute the loads of those conservative parameters requiring allocations. The study area is depicted in Figure 3.

Parameter Selection Effluent data for the Shawnee #2 WWTP were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA - Discharge Monitoring Report (DMR) data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR)	January 2009 through August 2014
Ohio EPA data (compliance, survey)	2013

The effluent data were checked for outliers and no values were removed.

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 7.

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 11 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 for direct discharges to lakes are done using the following equation for average criteria: $WLA = (11 \times \text{Water Quality Criteria}) - (10 \times \text{Background Concentration})$. Allocations for maximum criteria are set equal to the Inside Mixing Zone Maximum values.

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 9, and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

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

The data used in the WLA are listed in Tables 4 and 5. The WLA results to maintain all applicable criteria are presented in Table 10. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

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

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

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU_c) and 7Q10 flow for the average and the acute toxicity unit (TU_a) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For Shawnee #2 WWTP, the WLA values are 1.0 TU_a and 12.4 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):

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

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 10. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 7, 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 11.

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

Dissolved Oxygen, Total Suspended Solids, Ammonia, CBOD₅, & TKN

The limits proposed for dissolved oxygen, total suspended solids, ammonia, and CBOD₅ are based on the existing permit. These limits are protective of WQS. Monitoring for TKN will continue in order to assist in the evaluation of effluent quality and treatment plant performance.

Oil & Grease, pH, and E. coli

Limits proposed for oil and grease, pH, and *Escherichia coli* are based on WQS (OAC 3745-1-07). Class A Primary Contact Recreation *E. coli* standards apply to the Ottawa River.

Phosphorus

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

Chlorine

Shawnee #2 WWTP is currently on schedule to have a new UV disinfection system installed by summer 2015, after which the existing chlorination/de-chlorination system will be decommissioned. As such, total residual chlorine monitoring and limits will be removed beginning November 1, 2016.

The proposed interim limit for total residual chlorine is based on WLA as limited by the inside mixing zone maximum (IMZM). The IMZM is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone. The effluent limit for chlorine at outfall 001 is less than the quantification level of 0.050 mg/L. However, a pollutant minimization program is not required because the dosing rate of de-chlorination chemicals ensures that the water quality based effluent limit is being met.

Mercury Reasonable Potential and Mercury Variance

The Shawnee #2 WWTP permit was renewed on April 1, 2011 to include a mercury variance, and variance-based limits for mercury. Based on the monitoring results from January 2009 through August 2014, and the new application information, the Shawnee #2 WWTP has determined that the facility will not meet the 30-day average permit limit of 1.3 nanograms per liter (ng/L). However, the effluent data shows that the permittee can meet the mercury annual average value of 12 ng/L. The permittee's application has also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based upon these demonstrations, the Shawnee #2 WWTP is eligible for the mercury variance under Rule 3745-33-07(D)(10)(a) of the Ohio Administrative Code (OAC).

The Shawnee #2 WWTP submitted information supporting the renewal of the variance. The permittee identified a sub-basin in the collection system which contained relatively high mercury concentrations. Site visits were made to businesses identified as potential sources and customers were informed of proper mercury disposal procedures. Although no significant sources were identified, subsequent samples collected in the sub-basin have shown lower mercury concentrations. The calculation of the PEQavg value from 2009 to 2014 compared to the PEQavg (7.759 ng/L) calculated at the time the original variance was issued shows a reduction from 7.759 to 4.692 ng/L. The PMP schedule developed from the original variance continues to be implemented, and further reductions in mercury may be possible.

Ohio EPA has reviewed the mercury variance application and has determined that the application meets the requirements of the OAC. As a result, the variance is proposed to be issued as a condition in Part II of the NPDES permit, and the following requirements have been incorporated into the draft permit:

- mercury effluent limits developed from sampling data submitted by the Shawnee #2 WWTP of 7.5 ng/L for the 30-day average limit;
- a requirement that the Shawnee #2 WWTP make reasonable progress to meet the water-quality-based effluent limit for mercury by implementing the plan of study which has been developed as part of the pollutant

minimization program;

- influent and effluent monitoring for mercury;

- a requirement that the average annual effluent concentration for mercury is less than or equal to 12 ng/L as specified in the plan of study;

- a summary of the elements of the plan of study;

- a requirement for the Shawnee #2 WWTP to use the most sensitive analytical method approved by U.S. EPA; and

- a requirement that the Shawnee #2 WWTP submit a certification to Ohio EPA stating that all required permit conditions for the plan of study have been satisfied once these have been completed. In addition, the certification must state that compliance with the WQBEL for mercury has not been achieved.

Free Cyanide

Quarterly monitoring for free cyanide is being proposed as no data has been gathered using the new testing methods which have a lower detectable limit than the previous method.

Cadmium, Chromium, Chromium VI, Copper, Lead, Nickel, Nitrate + Nitrite, Total Filterable Residue, & Zinc
Ohio EPA risk assessment (Table 11) places cadmium, chromium, chromium VI, copper, lead, nickel, nitrate + nitrite, total filterable residue (dissolved solids), and zinc in groups 2 and 3. This placement as well as the data in Tables 4, 5, and 6 support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at a reduced frequency is proposed to document that these pollutants continue to remain at low levels.

Whole Effluent Toxicity Reasonable Potential

Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. Evaluating the toxicity data presented in Table 6 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6 does not show reasonable potential with respect to whole effluent toxicity. 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.

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 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

Compliance Schedule

Phosphorus Optimization

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

Sanitary Sewer Overflow Reporting

Provisions for reporting sanitary sewer overflows (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.

Also, the permit includes the addition of monitoring stations for the SSOs which are required to be monitored under the Director's Findings and Orders referenced on page 7 of this document. SSOs should be reported under each of these stations with the total system-wide SSO occurrences reported under Station 300.

Operator Certification

Operator certification requirements have been included in Part II, Item A of the permit in accordance with rules adopted in December 2006. These rules require the Shawnee #2 WWTP to have a Class III wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001.

Operator of Record

In December 2006, Ohio Administrative Code rule revisions became effective that affect the requirements for certified operators for sewage collection systems and treatment works regulated under NPDES permits. Part II, Item A(2) of this NPDES permit is included to implement rule 3745-7-02 of the OAC. It requires the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

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 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.

Storm Water Compliance

To comply with industrial storm water regulations, the permittee submitted a form for "No Exposure Certification" which was signed on August 12, 2014. Compliance with the industrial storm water regulations must be re-affirmed every five years. No later than August 12, 2019, the permittee must submit a new form for "No Exposure Certification" or make other provisions to comply with the industrial storm water regulations.

Outfall Signage

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



Figure 1. Location of Shawnee #2 WWTP Monitoring Stations.

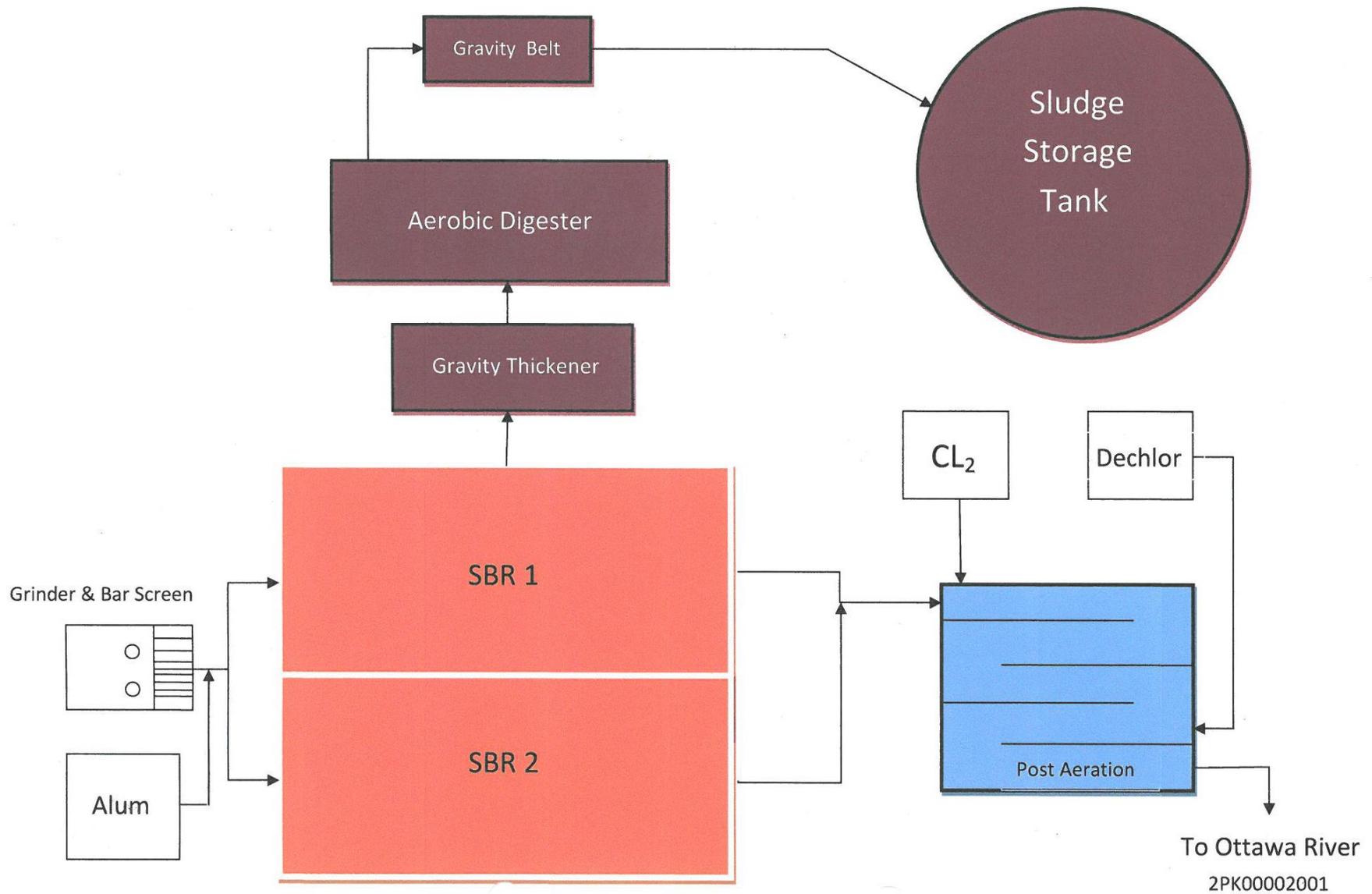


Figure 2. Shawnee #2 WWTP Schematic.

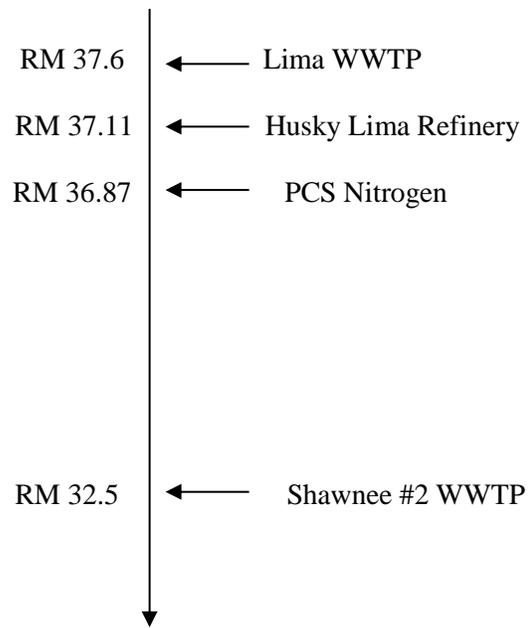


Figure 3. Ottawa River Study Area.

Table 1. Summary of the Ottawa River Use Designation Status, and Causes/Sources of Impairment.

Location	RM	Aquatic Life Use Desig.	Attain. Status	Causes of Impairment	Sources of Impairment
Ottawa at Fetter Rd.	44.3	WWH	FULL		
Ottawa dst. Metzger Dam	43.4	WWH	PARTIAL	Low Flow Alteration, Nutrient/Eutrophication Biol. Indicators, Nutrients	Flow Alteration from Water Diversions, Impoundment, Crop Production with Subsurface Drainage
Ottawa dst. Roush Rd.	42.5	WWH	PARTIAL	Low Flow Alteration Nutrient/Eutrophication Biol. Indicators, Nutrients, DO (Low, Range)	Flow Alteration from Water Diversions, Impoundment, Crop Production with Subsurface Drainage
Ottawa at Sugar St.	41.3	WWH	FULL		
Ottawa dst. Lovers Lane Dam	40.1	WWH	PARTIAL	Nutrient/Eutrophication Biol. Indicators, Nutrients DO (Range)	SSOs, CSOs
Ottawa dst. Elm St. Dam	39.6	WWH	FULL		
Ottawa dst Erie RR Dam, Upst Lima WWTP	37.9	WWH	PARTIAL	Nutrient/Eutrophication Biol. Indicators, DO (Range), Organic Enrichment (Sewage), Biological Indicators, Nutrients, Other Anthropomorphic Substrate Alteration	CSOs, Impoundment, Historic Bottom Deposits
Ottawa dst Lima WWTP	37.4	WWH	PARTIAL	Nutrient/Eutrophication Biol. Indicators, Ammonia-N, Nutrients	Municipal Point Source Discharges, CSOs
Ottawa dst Husky Refinery	37.0	WWH	NON	Nutrient/Eutrophication Biol. Indicators, Ammonia-N, Nutrients, Excess Algae, Chronic Toxicity (Impairment Unknown)	Municipal Point Source Discharges, Industrial Point Source Discharge, Source Unknown
Ottawa dst PCS Nitrogen	36.1	WWH	NON	Nutrient/Eutrophication Biol. Indicators, Ammonia-N, Nutrients, DO (Range), Chronic Toxicity (Impairment Unknown)	Municipal Point Source Discharges, Industrial Point Source Discharges, Source Unknown

Ottawa adj. Westfield Dr. (dst major dischargers)	34.6	WWH	PARTIAL	Nutrient/Eutrophication Biol. Indicators, DO (Minimum, Range), Nutrients, Chronic Toxicity (Impairment Unknown)	Municipal Point Source Discharges, Industrial Point Source Discharges, Source Unknown

Table 1, Continued.

Location	RM	Aquatic Life Use Desig.	Attain. Status	Causes of Impairment	Sources of Impairment
Ottawa at Elm St./Dst Shawnee WWTP	31.1	WWH	PARTIAL	Nutrient/Eutrophication Biol. Indicators, DO (Minimum, Range), Nutrients, Organic Enrichment (Sewage), Biological Indicators,	SSOs, Municipal Point Source Discharges, Industrial Point Source Discharges, Urban Runoff/Storm Sewers
Ottawa at Allentown Dam Pool	28.9	WWH	PARTIAL	Nutrient/Eutrophication Biol. Indicators, Nutrients, Fish-Passage Barriers	SSOs, Municipal Point Discharge, Impoundment
Ottawa at Piquad Rd.	25.8	WWH	FULL		

CSO – combined sewer overflow

DO – dissolved oxygen

RM – river mile

SSO – sanitary sewer overflow

WWH – warmwater habitat

Table 2. Sanitary Sewer Overflows for Shawnee #2 WWTP.

Discharge Location	Events Per Year					Totals
	2009	2010	2011	2012	2013	
Cam Court (003)	24	21	24	22	51	142
Elmview Drive (004)	--	--	--	--	--	--
Riverview Drive (005)	48	57	124	69	88	386
Shawnee Country Club (006)	35	30	87	40	70	262
Shawnee Country Club Main (007)	33	47	99	30	49	258
Zurmehly Road (009)	27	38	57	31	54	207

Table 3. Effluent Flow Rates for Shawnee #2 WWTP.

Year	Annual Flow (MGD)		
	50 th Percentile	95 th Percentile	Maximum
2009	1.534	3.2435	4.3147
2010	1.5649	2.954	3.5465
2011	2.061	3.5468	4.388
2012	1.544	3.2673	3.725
2013	1.627	3.1498	3.897

Table 4. Outfall 001 Effluent Characterization Using OEPA Data.

Parameter (Units)	Result (MDL)	
	3/27/2013	5/9/2013
Barium (µg/L)	32	34
Copper (µg/L)	4.3	4.3
Chloroform (µg/L)	24	26
Iron (µg/L)	2	2.6
Magnesium (mg/L)	50	50
Manganese (µg/L)	21	33
Nickel (µg/L)	2.3	2.5
Strontium (µg/L)	493	698
Total Dissolved Solids (mg/L)	468	478
Zinc (µg/L)	13	20

AA - below detectable limit

MDL – Method Detection Limit

OEPA – Ohio Environmental Protection Agency

Table 5. Effluent Data Using Self-Monitoring Reports for Shawnee #2 WWTP.

Parameter	Season	Units	Current Permit Limits		Current Permit Loading Limits		# Obs.	Percentiles		Data Range
			30 day	Daily	30 day	Daily		50 th	95 th	
<u>Outfall 001</u>										
Water Temperature	Annual	°C	--	--	--	--	1415	16	22.3	6-29
Dissolved Oxygen	Summer	mg/L	--	5.0 ^a	--	--	721	7.8	8.9	5-13.5
Dissolved Oxygen	Winter	mg/L	--	5.0 ^a	--	--	694	8.2	10.2	5.1-13.9
Total Filterable Residue	Annual	mg/L	--	--	--	--	9	469	678	317-770
Total Suspended Solids	Annual	mg/L	15.7	23.6 ^b	118.8	178.7 ^b	821	0	7.6	0-24.4
Oil and Grease	Annual	mg/L	--	10.0	--	--	143	0	0	0-29
Ammonia	Summer	mg/L	3.6	5.4 ^b	27.3	40.9 ^b	413	0.1	0.746	0-3.9
Ammonia	Winter	mg/L	--	--	--	--	408	0.4	3.12	0-7.47
Total Kjeldahl Nitrogen	Annual	mg/L	--	--	--	--	72	2.06	4.26	0-6.4
Nitrite + Nitrate	Annual	mg/L	--	--	--	--	72	3.35	5.91	0.7-7.7
Phosphorus	Annual	mg/L	1.0	1.5 ^b	7.6	11.4 ^b	283	0.6	1	0-1.3
Nickel	Annual	µg/L	--	--	--	--	27	0	0	0-0
Strontium	Annual	µg/L	--	--	--	--	9	645	931	467-1060
Zinc	Annual	µg/L	--	--	--	--	27	29	54.4	0-75
Cadmium	Annual	µg/L	--	--	--	--	27	0	0	0-0
Lead	Annual	µg/L	--	--	--	--	27	0	0	0-0
Chromium	Annual	µg/L	--	--	--	--	27	0	0	0-0
Copper	Annual	µg/L	--	--	--	--	54	0	2.8	0-15
Chromium VI	Annual	µg/L	--	--	--	--	34	0	0	0-0
Fecal Coliform	Annual	#/100 ml	--	--	--	--	142	33	602	1-3000
E. coli	Annual	#/100 ml	126	284 ^b	--	--	270	14	173	1-2050
Flow Rate	Summer	MGD	--	--	--	--	1043	1.42	3.12	0.195-4.39

Table 5, Continued.

Parameter	Season	Units	Current Permit Limits		Current Permit Loading Limits		# Obs.	Percentiles		Data Range
			30 day	Daily	30 day	Daily		50 th	95 th	
Flow Rate	Winter	MGD	--	--	--	--	1026	1.97	3.45	0.81-4.31
Flow Rate	Annual	MGD	--	--	--	--	2069	1.65	3.33	0.195-4.39
Chlorine	Annual	mg/L	--	0.038	--	--	721	0.02	0.03	0-0.05
Mercury, Total (Low Level)	Annual	ng/L	7.8	1700	0.000059	0.013	55	1.37	7.74	0.36-18.9
Acute Toxicity, Ceriodaphnia dubia	Annual	TUa	--	--	--	--	4	0	0	0-0
Chronic Toxicity, Ceriodaphnia dubia	Annual	TUc	--	--	--	--	4	0	0.935	0-1.1
Acute Toxicity, Pimephales promelas	Annual	TUa	--	--	--	--	4	0	0	0-0
Chronic Toxicity, Pimephales promelas	Annual	TUc	--	--	--	--	4	0	0	0-0
pH, Maximum	Annual	S.U.	--	9.0	--	--	1415	6.9	7.2	6.5-8.5
pH, Minimum	Annual	S.U.	--	6.5	--	--	1415	6.9	7.2	6.2-8.5
Residue, Total Filterable	Annual	mg/L	--	--	--	--	45	474	565	298-616
CBOD 5 day	Summer	mg/L	10.9	16.4 ^b	82.5	124.2 ^b	415	2.6	4.3	0-6.8
CBOD 5 day	Winter	mg/L	10.9	16.4 ^b	82.5	124.2 ^b	407	3.1	5.7	0-11

^a minimum

^b weekly limit

^c CBOD – carbonaceous biochemical oxygen demand

Table 6. Summary of Acute and Chronic Toxicity Results.

Date	Ceriodaphnia dubia		Pimephales promelas	
	Acute Toxicity (TU _a)	Chronic Toxicity (TU _c)	Acute Toxicity (TU _a)	Chronic Toxicity (TU _c)
7/22/2011	AA	AA	AA	AA
7/17/2012	AA	AA	AA	AA
7/19/2013	AA	AA	AA	AA
7/14/2014	AA	1.1	AA	AA

Table 7. Effluent Data and Summary of PEQs for Shawnee #2 WWTP.

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Ammonia – Summer	mg/L	280	195	0.191	0.398
Ammonia – Winter	mg/L	204	190	3.0	4.109
Barium	µg/L	2	2	94.32	129.2
Cadmium	µg/L	27	0	--	--
Chlorine	µg/L	720	422	21.9	30.
Chloroform ^A	µg/L	2	2	2.996	4.104
Chromium	µg/L	270	0	--	--
Chromium VI	µg/L	34	0	--	--
Iron	µg/L	2	2	152.6	209.0
Lead	µg/L	27	0	--	--
Magnesium	mg/L	2	2	74.90	102.6
Manganese	µg/L	2	2	91.54	125.4
Mercury	ng/L	55	55	4.634	7.336
Nickel	µg/L	2	2	6.935	9.5
Nitrate + Nitrite	mg/L	72	72	5.379	7.513
Phosphorus	mg/L	283	282	0.664	0.910
Strontium	µg/L	11	11	873.6	1155
Total filterable residue	mg/L	56	56	548.7	626.6
Zinc	µg/L	29	27	48.63	72.01

^A Carcinogen

PEQ – Projected effluent quality

Table 8. Water Quality in the Study Area for Shawnee #2 WWTP.

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Ammonia-Summer	mg/L	--	--	1.8	--	--
Ammonia-Winter	mg/L	--	--	6.1	--	--
Alpha-Hexachlorocyclohexane ^D	µg/L	0.0053	--	--	--	--
Aluminum	µg/L	4500.	--	--	--	--
Antimony	µg/L	780.	--	190.	900.	1800.
Arsenic	µg/L	580.	100.	150.	340.	680.
Barium	µg/L	160000.	--	220. ^A	2000. ^A	4000. ^A
Bis(2-ethylhexyl)phthalate	µg/L	32.	--	8.4 ^A	1100. ^A	2100. ^A
Boron	µg/L	200000.	--	3900. ^A	33000.	65000.
Bromoform	µg/L	890.	--	230. ^A	1100. ^A	2200. ^A
Cadmium	µg/L	730.	50.	6.0	16.	32.
Chlorine	µg/L	--	--	11.	19.	38.
Chloroform	µg/L	1700.	--	140. ^A	1300. ^A	2600. ^A
Chromium	µg/L	14000.	100.	220.	4500.	9100.
Chromium VI	µg/L	14000.	--	11	16	31
Copper	µg/L	64000.	500.	24	40	81
Cyanide – free	µg/L	48000.	--	5.2	22	44
Fluoride	µg/L	--	2000.	--	--	--
Iron	µg/L	--	5000.	--	--	--
Lead	µg/L	--	100.	27	510.	1000.
Manganese	µg/L	61000.	--	--	--	--
Mercury ^{B,D}	ng/L	3.1	10000.	910.	1700.	3400.
Molybdenum	µg/L	10000.	--	20000. ^A	190000. ^A	370000. ^A
Nickel	µg/L	43000.	200.	140.	1200.	2400.
Nitrate + Nitrite	mg/L	--	100.	--	--	--
Selenium	µg/L	3100.	50.	5.0	--	--
Silver	µg/L	11000.	--	1.3	11	22
Strontium	µg/L	1400000.	--	21000. ^A	40000.	81000.
Total filterable residue	mg/L	--	--	1500.	--	--
Urea	µg/L	--	--	17000. ^A	150000. ^A	300000. ^A
Zinc	µg/L	35000.	25000.	310.	310.	620.

^A Tier II

^B Wildlife criteria also apply; 1.3 ng/L.

^C Bioaccumulative Chemical of Concern (BCC)

Table 9. Instream Conditions and Discharger Flow for Shawnee #2 WWTP.

Parameter	Units	Season	Value	Basis
<i>Stream Flows</i>				
1Q10	cfs	annual	0.0	USGS 04187100, 1988-2013 data ^A
7Q10	cfs	annual	0.17	USGS 04187100, 1988-2013 data ^A
		summer	0	
		winter	0	
30Q10	cfs	summer	2.15	USGS 04187100, 1988-2013 data ^A
		winter	3.48	USGS 04187100, 1988-2013 data ^A
90Q10	cfs	annual	4.36	USGS 04187100, 1988-2013 data ^A
Harmonic Mean	cfs	annual	5.06	USGS 04187100, 1988-2013 data ^A
Mixing Assumption	%	average	25	Stream-to-discharge ratio
	%	maximum	100	Stream-to-discharge ratio
<i>Hardness</i>	mg/L	annual	308	Lima 901 & STORET, N=115, 2009-2014
<i>Background Water Quality</i>				
Alpha-Hexachlorocyclohexane	µg/L	annual	0	No representative data available.
Arsenic	µg/L	annual	2.25	STORET; 40 values, 12<MDL, 2010-11
Barium	µg/L	annual	47.0	STORET; 40 values, 0<MDL, 2010-11
Bis(2-ethylhexyl)phthalate	µg/L	annual	0	No representative data available.
Cadmium	µg/L	annual	0	STORET; 40 values, 40<MDL, 2010-11
Chlorine	mg/L	annual	0	No representative data available.
Chromium	µg/L	annual	0	STORET; 40 values, 40<MDL, 2010-11
Chromium VI	µg/L	annual	0	No representative data available.
Copper	µg/L	annual	2.45	STORET; 40 values, 2<MDL, 2010-11
Cyanide - free	mg/L	annual	0	No representative data available.
Fluoride	µg/L	annual	0	No representative data available.
Iron	µg/L	annual	441	STORET; 40 values, 0<MDL, 2010-11
Lead	µg/L	annual	1.0	STORET; 40 values, 39<MDL, 2010-11
Mercury	ng/L	annual	0	No representative data available.

Table 9, Continued.

Parameter	Units	Season	Value	Basis
Molybdenum	µg/L	annual	0	No representative data available.
Nickel	µg/L	annual	4.6	STORET; 40 values, 0<MDL, 2010-11
Selenium	µg/L	annual	1.0	STORET; 40 values, 38<MDL, 2010-11
Silver	µg/L	annual	0	No representative data available.
Strontium	µg/L	annual	1855	STORET; 40 values, 0<MDL, 2010-11
Total filterable residue	mg/L	annual	488	STORET; 45 values, 0<MDL, 2010-11
Zinc	µg/L	annual	5.0	STORET; 40 values, 30<MDL, 2010-11
<i>Discharger Flows</i>				
Shawnee #2 WWTP	cfs (MGD)	design	3.09 (2.0)	OEPA
Lima WWTP	cfs (MGD)	design	28.62 (18.5)	OEPA
Husky Lima Refinery	cfs (MGD)	design	4.64 (3.0)	OEPA
PCS Nitrogen	cfs (MGD)	design	6.4 (4.33)	OEPA

^A Actual period of record is October 1988 to September 1999, and September 2009 to September 2013.

MDL – Method detection limit

OEPA – Ohio Environmental Protection Agency

STORET – EPA Storage and Retrieval data repository

USGS – United States Geological Survey

Table 10. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria for Shawnee #2 WWTP.

Parameter	Units	Outside Mixing Zone Criteria			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Average				
		Human Health	Agri-culture	Aquatic Life		
Barium	µg/L	165300 ^A	--	220	2000	4000
Chlorine	µg/L	--	--	35	60 ^A	38
Copper	µg/L	66120 ^A	517 ^A	24	40	81
Mercury ^{B,C}	ng/L	3.1	10000 ^A	910	1700	3400
Total filterable residue	mg/L	--	--	1501	--	--

^A Allocation must not exceed the Inside Mixing Zone Maximum

^B Wildlife criteria limit; 1.3 ng/L.

^C Bioaccumulative Chemical of Concern (BCC); no mixing zone allowed after 11/15/2010, WQS must be met at end-of-pipe, unless the requirements for an exclusion are met as listed in Ohio Administrative Code (OAC) 3745-2-08 (L).

Table 12. Final Effluent Limits and Monitoring Requirements for Shawnee #2 WWTP Outfall 001.

Parameter	Units	Effluent Limits				Basis ^b
		Concentration		Loading (kg/day) ^a		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Flow	MGD	----- Monitor -----				M ^c
Temperature	°C	----- Monitor -----				M ^c
Dissolved Oxygen	mg/L	----- Not less than 5.0 -----				EP
Carbonaceous biochemical oxygen demand (5-day)	mg/L	10.9	16.4 ^d	82.5	124.2 ^d	EP
Total Suspended Solids	mg/L	15.7	23.6 ^d	118.8	178.7 ^d	EP
Total Filterable Residue	mg/L	----- Monitor -----				M
Ammonia – Summer	mg/L	3.6	5.4 ^d	27.3	40.9 ^d	EP
Ammonia – Winter	mg/L	--	--	--	--	EP
Total Kjeldahl Nitrogen	mg/L	----- Monitor -----				EP/M ^c
Nitrite + Nitrate	mg/L	----- Monitor -----				EP/M ^c
Phosphorus	mg/L	1.0	1.5 ^d	7.6	11.4 ^d	PTS
Oil and Grease	mg/L	----- Not greater than 10.0 -----				WQS
pH	S.U.	6.5 - 9.0				WQS
<i>E. coli</i> – Summer	#/100mL	126	284 ^d	--	--	WQS
Chlorine (Interim)	mg/L	--	0.038	--	--	RP/PD
Cyanide, Free	µg/L	----- Monitor -----				M
Cadmium	µg/L	----- Monitor -----				EP/M
Chromium	µg/L	----- Monitor -----				EP/M
Chromium IV	µg/L	----- Monitor -----				EP/M
Copper	µg/L	----- Monitor -----				M
Lead	µg/L	----- Monitor -----				EP/M
Mercury	ng/L	7.5	1700	0.000057	0.013	VAR/WLA
Nickel	µg/L	----- Monitor -----				EP/M
Zinc	µg/L	----- Monitor -----				EP/M
Whole Effluent Toxicity						
Acute, <i>Ceriodaphnia dubia</i>	TU _a	----- Monitor w/o Trigger -----				WET
Chronic, <i>Ceriodaphnia dubia</i>	TU _c	----- Monitor w/o Trigger -----				WET
Acute, <i>Pimephales promelas</i>	TU _a	----- Monitor w/o Trigger -----				WET
Chronic, <i>Pimephales promelas</i>	TU _c	----- Monitor w/o Trigger -----				WET

^a Effluent loadings based on average design discharge flow of 2.0 MGD.

- ^b Definitions: **EP** = Existing Permit
 M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
 PD = Plant Design
 PTS = Phosphorus Treatment Standards (OAC 3745-33-06 (C))
 RP = Reasonable Potential (Risk Assessment Group 4 or 5)
 VAR = Mercury variance (OAC 3745-33-07(D)(10)(a))
 WET = Whole Effluent Toxicity (OAC 3745-33-07(B))
 WLA = Wasteload Allocation procedures (OAC 3745-2)
 WQS = Ohio Water Quality Standards (OAC 3745-1)
- ^c 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.