

National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for Archbold Waste Water Treatment Plant
(Revised 4/21/14)

Public Notice No.: 14-04-020
Public Notice Date: April 10, 2014
Comment Period Ends: May 10, 2014

Ohio EPA Permit No.: 2PD00017*LD
Application No.: OH00020796

Name and Address of Applicant:

Village of Archbold
300 North Defiance Street
Archbold, Ohio 43502

Name and Address of Facility Where
Discharge Occurs:

Archbold Wastewater Treatment Plant
515 Short Buehrer Road
Archbold, Ohio 43502

Receiving Water: Brush Creek

Subsequent Stream Network: Tiffin River, Maumee
River, 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, Chapter 6111 of the Ohio Revised Code (ORC). 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 Environmental Protection Agency (U.S. EPA) in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the secondary treatment regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations (WLAs) are used to develop these limits based on the pollutants that have been detected in the discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the

Fact Sheet for NPDES Permit Renewal, Archbold Waste Water Treatment Plant, 2014

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 PEQ - Projected Effluent Quality. 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: flow, temperature, dissolved oxygen, ammonia, 5-day carbonaceous biochemical oxygen demand (CBOD₅), total suspended solids (TSS), total phosphorus, nitrite+nitrate-nitrogen, total Kjeldahl nitrogen, oil and grease, pH, cadmium, chromium, dissolved hexavalent chromium, copper, lead, nickel, and zinc.

Water quality based limits are proposed to continue for free cyanide. Approved testing methods are now available to accurately quantify free cyanide. Therefore the Village does not need to continue its pollutant minimization program for this pollutant.

Ohio EPA is proposing to renew the mercury variance for this treatment plant. Archbold has made progress in their pollutant minimization efforts, as shown by the Village's mercury recycling events, and continued monitoring for mercury.

Chronic toxicity limits for *Ceriodaphnia dubia* have been removed from the permit because testing has shown that toxicity is no longer a problem in the plant effluent. Annual chronic testing with the determination of acute endpoints using both *C. dubia* and fathead minnows is proposed for the life of the permit.

Monitoring is proposed for total dissolved solids, based on the WLA.

In Part II of the permit, special conditions are included that address sanitary sewer overflow (SSO) reporting; operator certification, minimum staffing and operator of record; whole effluent toxicity testing; 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. EPA

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 Ryan Gierhart, (419) 373-3053, ryan.gierhart@epa.ohio.gov or Megan Zale, megan.zale@epa.ohio.gov, (614) 644-2027.

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 Ohio Revised Code Section 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 National Pollutant Discharge Elimination System (NDPES) 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 water quality based effluent limitations 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 water quality standard(s) 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 water quality standard(s) pursuant to OAC Rule 3745-1-35. The permittee shall submit written notification regarding their intent to develop site specific water quality standards 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

Archbold WWTP discharges to Brush Creek at river mile 13.9. Figure 1 shows the approximate location of the facility.

This segment of Brush Creek is described by Ohio EPA River Code: 04-614, U.S. EPA River Reach #:04100006-004, County: Fulton, Ecoregion: Huron/Erie Lake Plains. Brush Creek is designated for the following uses under Ohio's water quality standards (OAC 3745-1-11): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Class B 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 water quality standards are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal Clean Water Act. Ohio WQS also include aquatic life use designations for waterbodies which cannot meet the Clean Water Act 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

An upgrade and expansion of the Archbold wastewater plant came on line in May 2007. Its average daily design flow is 2.5 MGD (million gallons per day). Prior to the upgrade, the final effluent discharged after a polishing lagoon through outfall 001. Since the upgrade was completed, treatment no longer includes a polishing lagoon, and final effluent is discharged through outfall 002.

Wet stream processes are screening, influent pumping, grit removal, primary settling, activated sludge aeration (contact stabilization), final clarification, chlorination, post aeration and dechlorination. Solid stream processes include anaerobic digestion, gravity belt thickening, sludge storage and disposal by land application at agronomic rates.

The Archbold plant is served by a separate sanitary sewer system.

The Village implements an Ohio EPA-approved industrial pretreatment program. Five categorical industrial users and two significant non-categorical industrial users discharge approximately 1.052 MGD to the plant.

Description of Existing Discharge

Table 1 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 2PD00018002. Data are presented for the period March 2009 through December 2013.

Table 2 presents chemical specific data reported in annual pretreatment reports and data collected by Ohio EPA.

Table 3 summarizes the chemical specific data for outfall 002 by presenting the average and maximum Projected Effluent Quality (PEQ) values.

Table 4 summarizes the results of whole effluent toxicity tests of the final effluent.

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

The facility reported 2 sanitary sewer overflows in 2011.

Assessment of Impact on Receiving Waters

Current water quality survey information documenting the impact of the Archbold wastewater plant on water quality in Brush Creek is not available. A total maximum daily load (TMDL) study report is scheduled for 2016, and can be found at <http://www.epa.state.oh.us/dsw/tmdl/MaumeeRiver.aspx>.

The draft *Ohio 2014 Integrated Water Quality Monitoring and Assessment Report* (Ohio EPA) lists Brush Creek as impaired for aquatic life and human health. No information was provided as to the causes of impairment. The complete draft report is available at <http://epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.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 Archbold 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)	March 2009 through December 2013
Pretreatment data	2009 through 2012
Ohio EPA compliance sampling data	2012

The data were examined, and the following values were removed from the evaluation to give a more reliable projection of effluent quality: Diethylphthalate, 188 ug/L, 5/7/2012. This value is the only one out of 6 to be above the MDL, and appears to be an outlier.

This data is evaluated statistically, and Projected Effluent Quality (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 (WQS) and allowable WLA (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 13 for a summary of the screening results.

Wasteload Allocations

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
Wildlife		Annual 90Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

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

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

The data used in the WLA are listed in Tables 3, 5, and 6. The WLA results to maintain all applicable criteria are presented in Table 7. Current ammonia limits were found to be protective of aquatic life.

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 Archbold WWTP, the WLA values are 0.4 TU_a and 1.0 TU_c.

The chronic toxicity unit (TU_c) is defined as 100 divided by the concentration of effluent which has an inhibitory effect on 25% of the test organisms for the monitored effect, as compared to the control (IC₂₅):

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

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

$$TU_c = 100/\text{geometric mean of NOEC and LOEC}$$

Where NOEC is No Observable Effect Concentration and LOEC is Lowest Observable Effect Concentration

The acute toxicity unit (TU_a) is defined as 100 divided by the concentration of effluent that is lethal to 50 percent of the exposed organisms (LC₅₀) for the most sensitive test species:

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

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

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

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

The acute WLA for Archbold is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1.2 to 1.

Reasonable Potential/ Effluent Limits/Hazard Management Decisions

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a water quality standard or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 7. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 7, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [(PEQ_{avg} ÷ PEL_{avg}) X 100, or (PEQ_{max} ÷ PEL_{max}) X 100], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 8.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 9 presents the final effluent limits and monitoring requirements proposed for Archbold Waste Water Treatment Plant outfall 002 and the basis for their recommendation.

Mercury Reasonable Potential and Mercury Variance

The Ohio EPA risk assessment (Table 8) places mercury in group 5. This placement as well as the data in Tables 1 and 2 indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality.

To comply with mercury limits, the permittee has applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the Ohio Administrative Code. Based on the results of low-level mercury monitoring, the permittee has determined that its wastewater treatment plant cannot meet the 30-day average water quality-based effluent limit (WQBEL) of 1.3 nanograms per liter (ng/L). However, the permittee believes that the plant will be able to achieve an annual average mercury effluent concentration of 12 ng/L. The variance application also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based on these factors, the permittee is eligible for coverage under the general mercury variance.

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

- A variance-based monthly average effluent limit of 2.4 ng/L, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee 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 (PMP);
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/L as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average water quality-based effluent limit for mercury has not been achieved.

CBOD₅, TSS, Dissolved Oxygen, and Ammonia

The limits proposed for dissolved oxygen, CBOD₅ (5-day carbonaceous biochemical oxygen demand), total suspended solids and ammonia-nitrogen are design criteria for the upgraded treatment plant. They are all a continuation of existing permit limits

pH, Oil and Grease, and E.coli

The limits proposed for pH, oil and grease and E. coli are based on Ohio water quality standards (OAC 3745-1-07). These are a continuation of the existing permit.

Nitrate+Nitrite-Nitrogen, Total Kjeldahl Nitrogen

The continuation of monitoring for nitrate+nitrite-nitrogen and Total Kjeldahl Nitrogen (TKN) is proposed based on best engineering judgment. Monitoring for nitrate+nitrite and TKN is proposed because the Archbold WWTP discharges to effluent-dominated water. The purpose of the monitoring is to maintain a data set tracking nutrient levels in Maumee River basin.

Copper, Total Recoverable Chromium, Lead, Nickel, and Zinc

Based on reasonable potential for requiring monitoring in NPDES permits [OAC 3745-33-07(A)], monitoring is proposed to continue for copper, total recoverable chromium, lead, nickel, and zinc. Because these contaminants were included in Group 2 and 3 under the risk assessment procedures (Table 8), monitoring at a frequency of once per quarter is proposed. The purpose of the monitoring is to maintain a current data base on the level of these contaminants in the plant effluent. This data will be used to assess reasonable potential at future permit renewals.

Free Cyanide and Dissolved Hexavalent Chromium

Based on reasonable potential for requiring final effluent limits in NPDES permits [OAC 3745-33-07 (A)], water quality based effluent limits are proposed for free cyanide. Monitoring will continue for dissolved hexavalent chromium. Both parameters were included in Group 5 under the risk assessment procedures (Table 8) The grouping for dissolved hexavalent chromium may not be accurate because the risk assessment was based on only one value above detection. The limits for free cyanide are carried over from the previous permit and are based on wasteload allocation. Approved testing methods are now available for free cyanide.

Phosphorus

Phosphorus is limited based on provisions of OAC 3745-33-06(C) The limits are the same as in the existing permit

Total Residual Chlorine

The proposed total residual chlorine limit is based on the wasteload allocation. The effluent limit for chlorine at outfall 002 is than the quantification level of 0.050 mg/l. However, a Pollutant Minimization program is not required because the dosing rate of dechlorination chemicals ensures that the water quality based effluent limit is being met.

Total Dissolved Solids

The Ohio EPA risk assessment (Table 8) places Total Dissolved Solids in group 5, which recommends limits to protect water quality. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), we are proposing monitoring, rather than limits, for this pollutant. The PEQ values calculated for Total Dissolved Solids (Table 3) may not be representative of its actual levels in the plant effluent they were based on two data points. The purpose of the proposed monitoring is to collect additional data on the frequency of occurrence and variability of these pollutants in the plant's effluent.

Whole Effluent Toxicity Reasonable Potential

Prior to October 2009, chronic toxicity to *Ceriodaphnia dubia* was detected in several tests, and this was traced to problems in the upstream control water. After identifying this problem, lab water was used as the primary control beginning in June 2010. From June 2010 through March 2014, 13 chronic toxicity tests using *C. dubia* showed that toxicity was below detection. See Table 4. Evaluating these results under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, shows no reasonable potential for chronic toxicity to *C. dubia*.

Considering these results, annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. Both *C. dubia* and fathead minnows will be tested. This testing is 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 and transfer to another facility with an NPDES permit.

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

Other Requirements

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.

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 Archbold 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 of this NPDES permit is included to implement rule 3745-7-02 of the Ohio Administrative Code (OAC). It requires the permittee to designate one or more operator of record to oversee the technical operation of Archbold WWTP.

Storm Water Compliance

The City obtained a no exposure certification, permit number 2GRN00461*EG, on April 28, 2014 for stormwater discharges from the WWTP. Coverage under this permit must be renewed when it expires on April 28, 2019.

Outfall Signage

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

Compliance Schedule

A 6 month compliance schedule is proposed for the City to submit a technical justification for either revising its local industrial user limits or retaining its existing local limits. If revisions to local limits are required, the City/County must also submit a pretreatment program modification request.

Figure 1. Location of Archbold WWTP



Table 1. Effluent Characterization Using Self-Monitoring Data

Summary of unaltered discharge monitoring report data for Archbold outfall 2PD00017002 (March 2009 – December 2013). All values are based on annual records unless otherwise indicated.

Parameter	Season	Units	# Obs.	Percentiles		Data Range
				50 th	95 th	
Water Temperature	Annual	C	1692	20	27	8-30
Dissolved Oxygen	Summer	mg/l	910	6.5	7.7	2.2-8.7
Dissolved Oxygen	Winter	mg/l	782	7.3	9	3.3-10.3
Total Suspended Solids	Annual	mg/l	717	14	38	0-76
Oil and Grease	Annual	mg/l	135	0	5.23	0-41.6
Nitrogen, Ammonia (NH ₃)	Summer	mg/l	362	0.5	1.93	0.08-4.95
Nitrogen, Ammonia (NH ₃)	Winter	mg/l	334	0.8	3.13	0.05-11.4
Nitrogen Kjeldahl, Total	Annual	mg/l	76	2.75	9.18	0-13.2
Nitrite Plus Nitrate, Total	Annual	mg/l	60	1.42	20.2	0.21-28.5
Phosphorus, Total (P)	Annual	mg/l	265	0.58	1.62	0.12-3.41
Cyanide, Free	Annual	mg/l	79	0	0.006	0-0.015
Nickel, Total Recoverable	Annual	ug/l	38	0	6.3	0-9
Zinc, Total Recoverable	Annual	ug/l	38	18	33.3	0-64
Cadmium, Total Recoverable	Annual	ug/l	38	0	0	0-0
Lead, Total Recoverable	Annual	ug/l	38	0	0	0-0
Chromium, Total Recoverable	Annual	ug/l	37	0	0	0-0
Copper, Total Recoverable	Annual	ug/l	38	0	6.15	0-19
Chromium, Dissolved Hexavalent	Annual	ug/l	72	0	0	0-14
Fecal Coliform	Annual	#/100 ml	143	170	20000	7-21000
E. coli	Annual	#/100 ml	286	67.5	2420	1-2420
Flow Rate	Summer	MGD	920	1.52	2.36	0.401-4.99
Flow Rate	Winter	MGD	847	1.78	3.15	0.525-5.63
Flow Rate	Annual	MGD	1767	1.64	2.73	0.401-5.63
Chlorine, Total Residual	Annual	mg/l	910	0.02	0.02	0-1.03
Mercury, Total (Low Level)	Annual	ng/l	48	0.693	2.49	0-6.78
Mercury, Total (Low Level, PQL=1000)	Annual	ng/l	14	1.49	2.78	0-3.51
Chronic Toxicity, Ceriodaphnia dubia	Annual	TUc	18	0	1.15	0-1.4
pH, Maximum	Annual	S.U.	1692	7.32	7.78	6.63-8.98
pH, Minimum	Annual	S.U.	1692	7.18	7.51	6.34-8.41
CBOD 5 day	Summer	mg/l	332	3.9	8.89	0-64.5
CBOD 5 day	Winter	mg/l	278	6	15.3	0-31.4

Table 2. Effluent Characterization Using Ohio EPA and Pretreatment Data

PT=Pretreatment tests; OEPA=tests conducted by Ohio EPA during compliance monitoring

Parameter	PT				OEPA	
	3/30/2009	4/20/2010	3/30/2011	3/23/2012	3/26/2012	5/7/2012
Aluminum					<200	<201
Ammonia					0.896	1.19
Antimony	<5.0	<5.0	<5.0	<5.0		
Arsenic	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0
Barium					19	<15
Beryllium	<3.0	<3.0	<3.0	<3.0		
Bromodichloromethane					0.63	1.09
Bromomethane					0.85	<0.50
Cadmium	<3.0	<3.0	<3.0	<3.0	<0.20	<0.20
Calcium					82	79
CBOD5					7.1	6.9
Chloroform	6.9	9.2	9.8	8.1	8.24	8.86
Chromium	<7.0	<7.0	<7.0	<7.0	<2.0	<2.1
Copper	9.0	<8.0	<8.0	<8.0	5.8	6.0
Cyanide, free					<5	<6
Diethylphthalate	<10.0	<10.0	<10.0	<10.0	<5.2	188
Dimethylphthalate	<10.0	<10.0	<10.0	<10.0	<5.2	26.8
Hardness					295	267
Iron					1010	665
Lead	<10.0	<10.0	<10.0	<10.0	<2.0	<2.1
Magnesium					22	17
Manganese					19	37
Mercury	<0.2	<0.2	<0.2	<0.2		
Nickel	<8.0	<8.0	<8.0	<8.0	3.5	3.8
Nitrate+nitrite					8.28	11.6
Oil & Grease					2.5	<2.2
Potassium					12	28
Selenium	<4.0	<4.0	<4.0	<4.0	<2.0	<2.1
Silver	<5.0	<5.0	<5.0	<5.0		
Strontium					768	629
Thallium	<5.0	<5.0	<5.0	<5.0		
TKN					2.47	2.87
Toluene	<5.0	<5.0	<5.0	<5.0	0.58	0.90
Total Dissolved Solids					566	636
Total Phosphorus					0.408	0.505
Total Suspended Solids					20	11
Zinc	31	22	40	18	13	26

Table 3. Projected Effluent Quality Values

MDL= Method Detection Limit; PEQ=Projected Effluent Quality

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Arsenic - TR	ug/l	6	0	--	--
Cadmium - TR	ug/l	42	0	--	--
Chlorine (wwh,ewh, mwh,cwh) - TRes	mg/l	849	824	0.02	0.035
Chromium - TR	ug/l	41	0	--	--
Chromium VI - Diss	ug/l	49	1	10.22	14
Copper - TR	ug/l	42	10	7.7445	12.619
Cyanide - free	mg/l	76	8	0.005261	0.007733
Dissolved solids (ave)	mg/l	2	2	1764.264	2416.8
Iron - TR	ug/l	2	2	2801.74	3838
Lead - TR	ug/l	42	0	--	--
Mercury - TR (BCC)	ng/l	44	30	2.39	3.89
Molybdenum	ug/l			--	--
Nickel - TR	ug/l	42	12	5.5926	8.557
Nitrate-N + Nitrite-N	mg/l	58	58	15.849	22.978
Selenium - TR	ug/l	6	0	--	--
Silver (wwh,ewh,mwh)	ug/l	4	0	--	--
Strontium	ug/l	2	2	2130.432	2918.4
Zinc - TR	ug/l	42	39	30.989	44.182
Ammonia-S	mg/l	231	231	1.038	2.1535
Ammonia-W	mg/l	145	145	2.2686	4.9578
Barium	ug/l	2	1	52.706	72.2
Bromodichloromethane	ug/l	2	2	3.02366	4.142
Bromomethane	ug/l	2	1	2.3579	3.23
Chloroform (Trichloromethane)	ug/l	5	5	16.4542	22.54
Diethyl phthalate	ug/l	5	0	--	--
Dimethyl phthalate	ug/l	6	1	41.0844	56.28
Magnesium	mg/l	2	2	61.028	83.6
Manganese - TR	ug/l	2	2	102.638	140.6
Phosphorus	mg/l	251	251	1.2065	1.853
TKN	mg/l	73	71	6.442	9.7387
Toluene	ug/l	2	2	2.4966	3.42

Table 4. Summary of Archbold WWTP C. Dubia Chronic Toxicity Tests

All tests are reported by permittee except where noted (O), which are Ohio EPA tests.
 AA=no detection; TUC=chronic toxicity units

Test Date	<i>C. dubia</i>			<i>P. promelas</i>	
	TUC	% mortality (24 hr screening)	% mortality (48 hr screening)	% mortality (24 hr screening)	% mortality (48 hr screening)
3/3/2009	1.4	-	-	-	-
6/2/2009	AA	-	-	-	-
8/2/2009	1.1	-	-	-	-
8/4/2009	1.4				
9/22/2009	1.2				
10/6/2009	AA				
12/1/2009	AA	-	-	-	-
3/2/2010	AA				
6/7/2010	AA	-	-	-	-
8/2/2010	AA	-	-	-	-
12/7/2010	AA	-	-	-	-
3/7/2011	AA	-	-	-	-
6/6/2011	AA	-	-	-	-
12/7/2011	AA	-	-	-	-
3/5/2012	AA	-	-	-	-
3/26/2012 (O)	-	0	0	0	0
5/7/2012 (O)	-	0	0	0	0
6/4/2012	AA	-	-	-	-
8/7/2012	AA	-	-	-	-
3/5/2013	AA	-	-	-	-
6/3/2013	AA	-	-	-	-
8/5/2013	AA	-	-	-	-
12/3/2013	AA	-	-	-	-
3/3/2014	AA				

Table 5. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria					Maximum Aquatic Life	Inside Mixing Zone Maximum
		Wildlife	Average					
			Human Health	Agri-culture	Aquatic Life			
Arsenic	ug/l	--	580	100	150	340	680	
Cadmium	ug/l	--	730	50	5.5	14	29	
Chlorine	mg/l	--	--	--	0.011	0.019	0.038	
Chromium	ug/l	--	14000	100	200	4200	8300	
Chromium VI – Dissolved	ug/l	--	14000	--	11	16	31	
Copper	ug/l	--	64000	500	22	37	73	
Cyanide - free	mg/l	--	48	--	0.0052	0.022	0.044	
Dissolved solids	mg/l	--	--	--	1500	--	--	
Iron	ug/l	--	--	5000	--	--	--	
Lead	ug/l	--	--	100	24	450	900	
Mercury	ng/l	1.3	3.1	10000	910	1700	3400	
Molybdenum	ug/l	--	10000	--	20000	190000	370000	
Nickel	ug/l	--	43000	200	120	1100	2200	
Nitrate + Nitrite	mg/l	--	--	100	--	--	--	
Selenium	ug/l	--	3100	50	5	--	--	
Silver	ug/l	--	11000	--	1.3	9.3	19	
Strontium	ug/l	--	1400000	--	21000	40000	81000	
Zinc	ug/l	--	35000	25000	280	280	570	
Ammonia-Summer	mg/l	--	--	--	1.8	--	--	
Ammonia-Winter	mg/l	--	--	--	5.3	--	--	
Barium	ug/l	--	160000	--	220	2000	4000	
Bromodichloromethane	ug/l	--	180c	--	340	3100	6200	
Bromomethane	ug/l	--	2600	--	16	38	75	
Chloroform (Trichloromethane)	ug/l	--	1700c	--	140	1300	2600	
Diethyl phthalate	ug/l	--	--	--	220	980	2000	
Dimethyl phthalate	ug/l	--	--	--	1100	3200	6400	
Magnesium	mg/l	--	--	--	--	--	--	
Manganese	ug/l	--	61000	--	--	--	--	
Phosphorus	mg/l	--	--	--	--	--	--	
TKN	mg/l	--	--	--	--	--	--	
Toluene	ug/l	--	51000	--	62	560	1100	

Table 6. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
<i>Stream Flows</i>				
1Q10	cfs	annual	0.614	USGS 4185000
7Q10	cfs	annual	0.699	USGS 4185000
		summer	0	
		winter	0	
30Q10	cfs	summer	0.938	USGS 4185000
		winter	2.898	USGS 4185000
90Q10	cfs	annual	0	
Harmonic Mean	cfs	annual	5.115	USGS 4185000
Mixing Assumption	%	average	25	
	%	maximum	100	
<i>Hardness</i>	mg/l	annual	278	Station 901 2009-2013 n=54
<i>pH</i>	S.U.	summer	7.51	Station 901 2009-2013 n=19
		winter	7.74	Station 901 2009-2013 n=12
<i>Temperature</i>	C	summer	22.5	Station 901 2009-2013 n=19
		winter	9	Station 901 2009-2013 n=12
<i>Archbold WWTP flow</i>	cfs	annual	3.868	DSW
<i>Background Water Quality</i>				
Arsenic	ug/l		0	No representative data available. Maumee Basin; thru 1988; n=107;
Cadmium	ug/l		0.25	69<MDL; 50th percentile
Chlorine – Total Residual	mg/l		0	No representative data available. Maumee Basin; thru 1988; n=102;
Chromium	ug/l		15	72<MDL; 50th percentile Maumee Basin; thru 1988; n=22;
Chromium VI - Dissolved	ug/l		0	4<MDL; 50th percentile Maumee Basin; thru 1988; n=269;
Copper	ug/l		5	75<MDL; 50th percentile
Cyanide - free	mg/l		0	No representative data available. Maumee Basin; thru 1988; n=81;
Dissolved solids	mg/l		448	0<MDL; 50th percentile Maumee Basin; thru 1988; n=225;
Iron	ug/l		1090	0<MDL; 50th percentile Maumee Basin; thru 1988; n=247;
Lead	ug/l		2	92<MDL; 50th percentile Maumee Basin; thru 1988; n=32;
Mercury	ng/l		250	11<MDL; 50th percentile
Molybdenum	ug/l		0	No representative data available. Maumee Basin; thru 1988; n=62;
Nickel	ug/l		20	51<MDL; 50th percentile Maumee Basin; thru 1988; n=466;
Nitrate + Nitrite	mg/l		0.87	57<MDL; 50th percentile
Selenium	ug/l		0	No representative data available.
Silver	ug/l		0	No representative data available.

Table 6.

Instream Conditions and Discharger Flow (continued)

<u>Parameter</u>	<u>Units</u>	<u>Season</u>	<u>Value</u>	<u>Basis</u>
Strontium	ug/l		696	statewide; 1999-2003; n=68; 0<MDL; Median Maumee Basin; thru 1988; n=130; 42<MDL;
Zinc	ug/l		15	50th percentile
Ammonia-Summer	mg/l		0.22	Station 801; 2008-2013; n=20; 0<MDL; station 801 2008-2013, Median N=20
Ammonia-Winter	mg/l		0.2	Station 801; 2008-2013; n=20; 0<MDL; station 801 2008-2013, Median N=12
Barium	ug/l		54	statewide; 1999-2003; n=68; 0<MDL; Median
Bromodichloromethane	ug/l			No representative data available.
Bromomethane	ug/l			No representative data available.
Chloroform				
(Trichloromethane)	ug/l			No representative data available.
Diethyl phthalate	ug/l			No representative data available.
Dimethyl phthalate	ug/l			No representative data available.
Magnesium	mg/l		18	STORET; 2012; n=2; 2<MDL; P07K22
Manganese	ug/l			No representative data available.
Phosphorus	mg/l			No representative data available.
TKN	mg/l			No representative data available.
Toluene	ug/l			No representative data available.

Table 7. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Wildlife	Average			Maximum	
			Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Arsenic	ug/l	--	772	133	157	394	680
Cadmium	ug/l	--	971	66	5.7	16	29
Chlorine – Total Residual	mg/l	--	--	--	0.011	0.022	0.038
Chromium	ug/l	--	18623	128	208	4864	8300
Chromium VI – Dissolved	ug/l	--	18628	--	11	19	31
Copper	ug/l	--	85157	664	23	42	73
Cyanide - free	mg/l	--	64	--	0.0054	0.025	0.044
Dissolved solids	mg/l	--	--	--	1548	--	--
Iron	ug/l	--	--	6293	--	--	--
Lead	ug/l	--	--	132	25	521	900
Mercury	ng/l	1.3	3.1	10000	910	1700	3400
Molybdenum	ug/l	--	13306	--	20904	220160	370000
Nickel - TR	ug/l	--	57209	260	125	1271	2200
Nitrate + Nitrite	mg/l	--	--	133	--	--	--
Selenium	ug/l	--	4125	67	5.2	--	--
Silver	ug/l	--	14637	--	1.4	11	19
Strontium	ug/l	--	1862606	--	21917	46239	81000
Zinc	ug/l	--	46566	33260	292	322	570
Ammonia-Summer	mg/l	--	--	--	--	--	--
Ammonia-Winter	mg/l	--	--	--	--	--	--
Barium	ug/l	--	212878	--	227	2309	4000
Bromodichloromethane	ug/l	--	240	--	355	3592	6200
Bromomethane	ug/l	--	3460	--	17	44	75
Chloroform (Trichloromethane)	ug/l	--	2262	--	146	1506	2600
Diethyl phthalate	ug/l	--	--	--	230	1136	2000
Dimethyl phthalate	ug/l	--	--	--	1150	3708	6400
Magnesium	mg/l	--	--	--	--	--	--
Manganese	ug/l	--	81166	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--
TKN	mg/l	--	--	--	--	--	--
Toluene	ug/l	--	67860	--	65	649	1100

Table 9. Final Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations				Basis ^b
		Concentration		Loading (kg/day) ^a		
		Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	
Temperature	°C	----- Monitor -----				M ^d
Dissolved Oxygen	mg/L	----- Not less than 5.3 -----				EP/PD
Suspended Solids	mg/L	24.6	36.9 ^c	233	350 ^c	EP/PD
Oil and Grease	mg/L	--	10	--	--	WQS, EP
Ammonia	mg/L					
Mar-May & Oct-Nov	mg/L	4.5	6.8 ^c	42.6	64.4 ^c	EP, PD
June-Sep	mg/L	1.3	2.1 ^c	12.4	19.9 ^c	EP, PD
Dec-Feb	mg/L	7.6	11.4 ^c	72	108 ^c	EP, PD
Total Kjeldahl-N	mg/L	----- Monitor -----				BEJ
Nitrite + Nitrate	mg/L	----- Monitor -----				BEJ
Phosphorus	mg/L	1.0	1.5 ^c	9.47	14.2 ^c	PT/TMDL
Cyanide, free	mg/L	0.0054	0.025	0.051	0.24	WLA, EP
Nickel	µg/L	----- Monitor -----				M
Zinc	µg/L	----- Monitor -----				M
Cadmium	µg/L	----- Monitor -----				M
Lead	µg/L	----- Monitor -----				M
Chromium	µg/L	----- Monitor -----				M
Copper	µg/L	----- Monitor -----				M
Dissolved Hexavalent Chromium	µg/L	----- Monitor -----				BEJ
<i>E. coli</i>						
Summer	#/100ml	161	362 ^c	--	--	WQS
Chlorine	mg/L	0.038	--	--	--	WLA, EP
Flow	MGD	----- Monitor -----				M ^d
Mercury	ng/L	2.4	1700	0.000023	0.0161	VAR, WLA
Whole Effluent Toxicity						
C. dubia Acute	TUa	----- Monitor -----				WET
C. dubia Chronic	TUc	----- Monitor -----				WET
P. promelas Acute	TUa	----- Monitor -----				WET
P. promelas Chronic	TUc	----- Monitor -----				WET
pH	S.U.	----- 6.5 to 9.0 -----				WQS, EP
Total Filterable Residue (Dissolved Solids)	mg/L	----- Monitor -----				BEJ
CBOD ₅	mg/L					
Summer		10	15 ^c	94.7	142 ^c	EP/PD
Winter		20.5	32.5 ^c	194	308 ^c	EP/PD

^a Effluent loadings based on average design discharge flow of 3.0 MGD.

^b **Definitions:** BEJ = Best Engineering Judgment; BPO/APO = Before/After mixing zone phase out, mixing zones for mercury are not allowed after November 15, 2010 [OAC 3745-2-05(A)(2)(iv) and 3745-2-08(L)]; EP = Existing Permit; M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges; PD = Plant Design Criteria; PT = Phosphorus treatment required under OAC 3745-33-06(C); RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits [OAC 3745-33-07(A)]; VAR = mercury variance-based limits, OAC 3745-33-07(D)(10); WET = Reasonable potential

for requiring water quality-based effluent limits and monitoring requirements for whole effluent toxicity in NPDES permits [40 CFR Part 132, Appendix F, Procedure 6 and OAC 3745-33-07(B)]; WLA = WLA procedures (OAC 3745-2); WQS = Ohio WQS (OAC 3745-1-07).

^c Weekly average limit.

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