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 **Ohio Power Company – General James M. Gavin Plant**

Public Notice No.: 13-11-046
Public Notice Date: November 29, 2013
Comment Period Ends: December 29, 2013

Ohio EPA Permit No.: **0IB00006*ND**
Application No.: **OH0028762**

Name and Address of Applicant:

Ohio Power Company
7397 North State Route 7
Cheshire, Ohio 43215

Name and Address of Facility Where Discharge Occurs:

Ohio Power – General James M. Gavin Plant
7397 North State Route 7
Cheshire, Ohio

Receiving Water: **Stingy Run, Turkey Run, Kyger Creek, Ohio River**

Subsequent Stream Network: **Kyger Creek, Ohio River**

Introduction

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

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This Fact Sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act (CWA) and Ohio Water Pollution Control Law (Ohio Revised Code Section 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.

In accordance with the antidegradation rule, Ohio Administrative Code 3745-1-05, I have determined that a lowering of water quality in Kyger Creek is necessary. Provision (D)(1)(g) was applied to this application for mercury variances. This provision excludes the need for the submittal and subsequent review of technical alternatives and social and economic issues related to the degradation. Other rule provisions, however, including public participation and appropriate intergovernmental coordination were required and considered prior to reaching this decision.

Effluent limits based on available treatment technologies are required by Section 301(b) of the CWA. Many of these have already been established by 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 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

Several of the effluent limits in the draft permit are the same as those in the existing permit; however, Ohio EPA is proposing changes to the limits and monitoring requirements. A summary of changes:

The effluent toxicity data shows that Outfall 008 discharges exceed the acute toxicity WLA in approximately 42% of tests. Ohio EPA believes that this outfall has the reasonable potential to contribute to exceedances of toxicity WQS, and has included a limit of 1.0 TUa in the permit. Based on effluent chemistry data, it seems likely that total dissolved solids (total filterable residue) concentrations are one of the main sources of toxicity.

Because Outfalls 007 and 009 have dissolved solids concentrations equal to or greater than those in Outfall 008, we are including acute toxicity limits at these outfalls as well. The draft permit contains a compliance schedule to allow time to meet the toxicity limits at all three of these outfalls.

Toxicity monitoring requirements for Outfalls 001 and 006 would be removed because there is no reasonable potential for these outfalls to contribute to exceedances of toxicity WQS.

The draft permit contains a mercury limit based on a variance at Outfall 008. Ohio Power has demonstrated that there is currently no demonstrated treatment technology capable of meeting WQS at

this discharge. The company has included further treatment trials as part of the required Pollutant Minimization Plan (PMP).

Ohio Power is proposing two new outfalls from the landfill area, Outfalls 010 and 011, which discharge to an unnamed tributary of Turkey Run, and an unnamed tributary of Stingy Run, respectively. The draft requirements for this outfall contain limits on total dissolved solids, ammonia-nitrogen, mercury, and acute toxicity, based on data for the other landfill outfalls. Some of these requirements are based on Ohio rules that apply Warmwater Habitat water quality criteria to waters that are undesignated in the Ohio WQS (these tributaries are not designated an aquatic life use in the Ohio WQS). If an Ohio EPA use attainability assessment indicates that the tributary cannot currently achieve the Warmwater Habitat (WWH) use, or other fishable use, then the limits may be changed at a future date. However, a stream use rulemaking cannot be completed before this permit is issued, and therefore some of the limits are based on WWH criteria applied to the unnamed tributary.

Several new water quality based limits are needed, based on the new WLA and reasonable potential analysis:

Copper limits for Outfalls 002 and 006 have been lowered to meet the new WLA numbers;
Outfall 007 data triggers limits for mercury and selenium;
Outfall 009 data triggers a limit for selenium.

The permit contains a compliance schedule to meet limits for all of these pollutant parameters.

Final effluent limits are proposed at Outfall 002 for *Escherichia coli.* New Ohio River Water Sanitation Commission (ORSANCO) WQS for *E. coli* became effective in 2012. Information from the permittee indicates that this outfall can currently meet the new WQS.

The draft permit contains new storm water control / best management practices (BMP) language in Parts IV, V, and VI of the permit. Based on a review of the Application Form 2F data, the permit contains periodic monitoring for zinc at storm water outfalls 004 and 005. The permit also sets a benchmark concentration for zinc discharges from these outfalls at the inside-mixing-zone maximum water quality standard. The benchmark concentration would come into effect 4 years after the effective date of the permit. The benchmark is not a discharge limit; it is a goal to guide the development of storm water controls. If unable to meet the benchmark with storm water controls/BMPs, Ohio Power would have the option to declare that no further improvements were feasible.

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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 and Compliance Section
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 Eric Nygaard at (614) 644-2024, eric.nygaard@epa.state.oh.us or Dan Messerly at (740) 380-5218, dan.messerly@epa.state.oh.us.

Location of Discharge/Receiving Water Use Classification

The Ohio Power Gavin Plan discharges to Stingy Run at River Miles (RM) 0.81 (Outfall 001) and 0.1 (Outfall 009) and proposes to discharge to an unnamed tributary of Stingy Run (Outfall 011). Stingy Run enters Kyger Creek at RM 4.64. Gavin discharges to Turkey Run at RM 0.57 (Outfall 007) and proposes to discharge to an unnamed tributary of Turkey Run at RM 0.3 – Turkey Run RM 1.4 (Outfall 010). Gavin Plant discharges directly to Kyger Creek at RM 4.1 (Outfall 008). Kyger Creek enters the Ohio River at Mile Point (MP) 260.7. Gavin Plant discharges to the Ohio River at MPs 258.4 (Outfalls 002 and 006), MP 258.3 (Outfall 005), MP 258.1 (Outfall 004) and MP 257.9 (Outfall 003). The plant withdraws water from the Ohio River at MP 258.2. Figure 1 shows the approximate location of the facility.

Kyger Creek is described by Ohio EPA River Code: 09-057, U.S. EPA River Reach #: 05030202-058, County: Meigs, Ecoregion: Western Allegheny Plateau. This segment of Kyger Creek is designated for the following uses under Ohio's WQS (OAC 3745-1-16): Limited Resource Water (LRW – Acid Mine Drainage), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Primary Contact Recreation (PCR – Class B).

Turkey Run is described by Ohio EPA River Code: 09-059, U.S. EPA River Reach #: 05030202-NA, County: Meigs, Ecoregion: Western Allegheny Plateau. Turkey Run is designated for the following uses under Ohio's WQS (OAC 3745-1-16): LRW – Acid Mine Drainage, AWS, IWS, and PCR – Class B.

The unnamed tributaries of Stingy Run and Turkey Run are described by Ohio EPA River Code: 09-NA, U.S. EPA River Reach #: 05030202-NA, County: Meigs, Ecoregion: Western Allegheny Plateau. These unnamed tributaries are not presently designated in the Ohio WQS. Undesignated waters must meet the chemical criteria associated with the WWH use [OAC 3745-1-07(A)(4)]; these waters are also designated PCR – Class B.

Stingy Run is described by Ohio EPA River Code: 09-060, U.S. EPA River Reach #: 05030202-NA, County: Meigs, Ecoregion: Western Allegheny Plateau. Stingy Run is designated for the following uses under Ohio's WQS (OAC 3745-1-16): LRW – Acid Mine Drainage, AWS, IWS, and PCR – Class B.

This segment of the Ohio River is described by Ohio EPA River Code: 25-350, U.S. EPA River Reach #: 05030202-005, County: Meigs, Ecoregion: Western Alleghey Plateau. The Ohio River is designated for the following uses under Ohio's WQS (OAC 3745-1-16): WWH, Public Water Supply (PWS), AWS, IWS, and Bathing Waters (BW). The Ohio River must also meet WQS set forth in OAC 3745-1-32.

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 can not meet the CWA goals because of human-caused conditions that can not be

remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given 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 Gavin Plant is a pulverized coal-fired steam electric generating facility consisting of two units, each rated at 1300 megawatts of generating capacity. The Gavin Plant uses a dry fly ash handling system. The dry fly ash is mixed with flue gas desulfurization (FGD) filter cake and transported to a coal combustion byproduct landfill located north of the plant.

The process operations performed at this facility are classified by the Standard Industrial Classification (SIC) codes 4911, "Electric Power Generation". Discharges resulting from process operations are therefore subject to Federal Effluent Guideline Limitations (FEGs), contained in Chapter 40 of the CFR, Part 423, "Steam Electric Power Generating" Industrial Category.

Description of Existing Discharge and Proposed Changes

Outfall 001 contains storm water that passes through the old fly ash pond that impounds part of Stingy Run. The company has not sent fly ash wastewaters to this pond since December 1994. Treatment of this water consists of sedimentation in the pond and neutralization. Sodium hydroxide is added to raise the pH of the water.

Ohio Power will be draining and reclaiming (filling in) this pond during the life of this NPDES permit. The project would be done in phases, with each impounded tributary being reclaimed, followed by the main body of the pond. The dam would also be lowered to the level of the fill. When completed, Stingy Run and its tributaries will flow through the filled pond, and fall over the remaining embankment. As part of this project, Ohio Power is considering passive treatment of the abandoned mine drainage in the headwaters of Stingy Run.

The discharge from Outfall 002 is the sewage treatment plant for the facility. Treatment involves grinding, pre-aeration, activated sludge aeration, sedimentation, slow sand filtration and ultraviolet disinfection. Sludge is aerobically digested, and disposed of by landfilling or hauling to another NPDES facility for further treatment.

Outfalls 003, 004 and 005 contain storm water runoff from the site. These areas include the production and treatment areas of the plant. The Outfall 003 drainage area contains heating oil storage (diked). The Outfall 004 drainage area contains the main transformer area for Unit 2 (diked) and a gasoline dispensing

area. The Outfall 005 drainage area contains the main transformer area for Unit 1 (diked), a curbed oil drum storage pad with an oil/water separator, a spare transformer and a sulfuric acid storage tank.

Outfall 006 is the discharge of excess water from the reclaim pond. Sources to this pond include bottom ash pond discharges and rainfall. The bottom ash pond receives wastewater from cooling tower blowdown, bottom ash and pyrite sluice, low volume wastewaters, coal pile runoff, the fly ash transfer building sump, chemical metal cleaning wastewater and any flows from the FGD emergency overflow pond. These wastewaters are treated by sedimentation, flocculation and neutralization.

Outfalls 007, 008 and 009 are existing landfill leachate and stormwater discharges from the FGD/fly ash landfill area. Outfall 008 also includes stormwater runoff from the stacker pad (a loading area for scrubber solids). Outfalls 007 and 009 are treated by sedimentation and neutralization; Outfall 008 is treated by sedimentation, neutralization and flocculation.

Proposed Outfalls 010 and 011 would also be another and storm water discharge from the landfill area. The discharge would be needed to collect and treat leachate from an expansion of the landfill. The 010 outfall is expected to be discharging in January 2015; the 011 outfall is expected to be discharging in 2020. The treatment facilities have not yet been designed nor has a permit-to-install been submitted. Ohio Power is conducting treatment studies of the other landfill outfalls to determine the level of treatment that would need to be provided to meet limits.

Consistent with 40 CFR 122.45(h), the draft permit would include monitoring and limits at internal station 606 (chemical metal cleaning wastewater). Effluent guideline limits are applied at this outfall to ensure that these treatment standards are met prior to combining with other waste streams. If monitoring was not done at this location, it would not be possible to verify compliance with these standards due to dilution. Federal rules at 40 CFR 125.3(f) prohibit attaining these standards by dilution.

Tables 2-8 present chemical specific data compiled from the NPDES renewal application and data collected by Ohio EPA.

Table 9 presents a summary of unaltered Discharge Monitoring Report (DMR) data for the Gavin Plant outfalls. Data are presented for the period 2008-12, and current permit limits are provided for comparison.

Table 11 summarizes the chemical specific data for the Gavin Plant outfalls by presenting the average and maximum Projected Effluent Quality (PEQ) values.

Table 10 summarizes the results of acute and chronic whole effluent toxicity tests of the final effluent.

Assessment of Impact on Receiving Waters

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 meet the biocriteria or one of the organism groups reflects poor or very poor performance. 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.

Kyger Creek and selected tributaries were evaluated for aquatic life and recreational use potential during the 2008 field season. This assessment included the collection of water chemistry and biological sampling at numerous sites in Kyger Creek and eight tributaries.

No recent biological data is available for the Ohio River near the Gavin Plant and Ohio Valley Electric Corporation – Kyger Creek Plant outfalls.

Table 1. below, summarizes the use designation status and causes and sources from the 2008 biological sampling for Kyger Creek, Stingy Run and Turkey Run.

Location	**RM**	**Use Designation**	**Status**	**Causes**	**Sources**
Kyger Ck dst Bell Lick Run	8.5	WWH	NON	Sedimentation/Siltation	Channelization/Coal Mining
Kyger Ck @ SR 554	8.42	WWH	NON	Sedimentation/Siltation	Channelization/Coal Mining

Kyger Ck upst Stingy Run	4.8	LRW	FULL		
Kyger Ck dst AEP 008	4.0	LRW	NON	Sedimentation/Siltation Manganese	Acid mine drainage/ Industrial point source discharge(landfill leachate)
Kyger Ck @ Gravel Hill Rd	3.4	LRW	NON	Sedimentation/Siltation Manganese	Acid mine drainage/ Industrial point source discharge(landfill leachate)
Kyger Ck dst L. Kyger Ck	1.0	LRW	FULL		
Kyger Ck @ SR 7	0.6	LRW	NON	Sedimentation/Siltation Manganese	Acid mine drainage/ Industrial point source discharge
Stingy Run near Mouth	0.2	LRW	FULL	Comment – The stream is maintaining the LRW use despite excessive sedimentation/siltation along with evidence of elevated metals associated with AMD. The stream is also negatively influenced by discharge from the AEP - Gavin fly ash pond.	
Turkey Run @ Turkey Rn Rd.	0.95	LRW	NON	Sedimentation/Siltation Manganese/pH	Acid mine drainage
Turkey Run near Mouth	0.4	LRW	NON	Sedimentation/Siltation Manganese/pH	Acid mine drainage/ Landfill leachate

The Kyger Creek watershed has been, and continues to be, impaired by acid mine drainage in most areas of the watershed. Because abandoned mine reclamation funds are not scheduled to be allocated to this watershed in the foreseeable future, Ohio EPA has designated Kyger Creek and several of its tributaries as LRW because they are unable to support fishable aquatic communities at the current pH levels. Even with this lowered stream use, some of the Gavin Plant outfalls have a discernible negative effect on their receiving waters, notably the effect of the Outfall 008 discharge to Kyger Creek; the stream did not meet LRW biological thresholds at RMS 4.0 and 3.4. Outfall 007 is also attributed as one cause of the impairment of Turkey Run at RM 0.4.

For additional details please refer to the Ohio EPA Technical Report ***"Biological and Water Quality Study of Kyger Creek and Select Tributaries 2008"***. This document was completed in 2011 and revised in March 2012. It can be found at http://www.epa.state.oh.us/dsw/document_index/psdindx.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.

This facility is considered to be interactive with the Ohio Valley Electric Corporation, which discharges to the Ohio River and Kyger Creek in the vicinity of the Ohio Power outfalls. The effluent flows used for Ohio Power are the 95th percentile of monthly average flows for January 2007 – October 2012.

The CONSWLA (conservative substance WLA) model was used to distribute effluent loadings between these two entities. A schematic of the study area, showing the outfalls included in this WLA, is shown in Figure 3.

Parameter Selection
Effluent data for Gavin Plant were used to determine what parameters should undergo WLA. The sources of effluent data are as follows:

Self-monitoring data (DMRs)	January 2007 through October 2012
2.C. Application data	2012
Ohio EPA data (compliance, survey)	2008

The effluent data were checked for outliers and the following values were eliminated from the data sets: for outfall 001, one value for copper of 31.µg/l; for outfall 002, one value for ammonia-W of 26.8 mg/l; and for outfall 006, one value for selenium of 24. µg/l.

The average and maximum projected effluent quality (PEQ) values are presented in Table 11.
For a summary of the screening results, refer to the parameter groupings in Tables 15-20.

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. 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	10% of Annual 7Q10
	Maximum	1% of Annual 7Q10
Agricultural Water Supply		Harmonic mean flow
Human Health - carcinogens		10% of Harmonic mean flow
Human Health – non carcinogens		Annual 7Q10

Allocations are developed using a percentage of stream design flow (as specified in Table 13), and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

Due to the LRW use designation, Aquatic Life average criteria do not apply in Kyger Creek, Stingy Run and Turkey Run; however outfalls discharging to those tributaries still have to meet all applicable criteria in the Ohio River. Average aquatic life criteria also apply to the unnamed, undesignated tributaries of Turkey Run and Stingy Run that would receive wastewater from Outfalls 010 and 011.

Regarding ammonia-N wasteload calculations; Ohio River discharges were screened using WLA procedures and meet applicable WQS. Outfalls discharging to the tributaries were assessed to determine whether they meet applicable WQS (see Tables 15-24).

The data used in the WLA are listed in Tables 12 and 13. The WLA results to maintain all applicable criteria are presented in Table 14.

Effluent temperature data for Outfall 006 was screened against WQS and WLA values, and meet applicable WQS.

Reasonable Potential
The preliminary effluent limits are the lowest average WLA (average PEL) and the maximum WLA (maximum PEL). To determine the reasonable potential of the discharger to exceed the WLA for each parameter, the facility's effluent quality is compared to the preliminary effluent limits. The average PEQ value (Table 11) is compared to the average PEL, and the maximum PEQ value is compared to the maximum PEL. Based on the calculated percentage of the respective average and maximum comparisons, the parameters are assigned to "groups", as listed in Table 15-20.

Since outfalls 010 and 011 are new discharge points (since the previous permit), and no PEQ data is available, it was not possible to determine reasonable potential for this outfall using the methods spelled out in rule. However, WLAs were calculated for these outfalls based on estimated effluent quality for a list of parameters using analytical data from outfall 009.

Whole Effluent Toxicity WLA
The allowable effluent toxicity (AET) is a factor considered in evaluating whole effluent toxicity. The AET calculations are similar to those for aquatic life criteria (using the chronic toxicity unit (TU_c) and 7Q10 for average and the acute toxicity unit (TU_a) and 1Q10 for maximum).

For the Gavin Plant outfalls, the AET values are as follows;

Outfall	TU_a	TU_c
001	0.30	156.1
002	1.0	33501.
006	1.0	37.1
007	0.64	1355.
008	1.0	1596.
009	1.0	1159.
010	0.30	1.0
011	0.30	1.0

Note: for AEP-Gavin outfalls 001, 007, 008 & 009 which discharge to Kyger Creek, Stingy Run and Turkey Run (all LRW), the TU_c value is calculated to meet criteria in the Ohio River.

The chronic toxicity unit (TU_c) is defined as 100 divided by the IC_{25}:

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

where IC25 is the effluent concentration that causes a 25% reduction in fish growth or water flea reproduction.

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 the No Observed Effect Concentration of the effluent, and LOEC is the Lowest Observed Effect Concentration.

The acute toxicity unit (TU_a) is defined as 100 divided by the LC_{50} for the most sensitive test species:

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

where LC50 is the effluent concentration that kills 50% of the test organisms.

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

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

The acute WLA for Outfalls 001, 010 and 011 is 30 percent mortality in 100 percent effluent based on the dilution ratio of less than 1 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 PEL based on the most restrictive average and maximum WLAs are selected from Table 14. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 11, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Tables 15-20.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Tables 21-24 presents the final effluent limits and monitoring requirements proposed for the Gavin Plant outfalls and the basis for their recommendation.

Parameter Issues Common to Most Outfalls

Ohio Power's NPDES application data shows detections of residual chlorine and bis(2-ethylhexyl)phthalate at Outfalls 002, 006, 007, 008 and 009. Detections of these parameters are not expected at most of these outfalls, given the operations tributary to them. Chlorine might be expected to be present at Outfall 006 due to the use of chlorine in the cooling tower system; the detections at the other outfalls are possibly analytical errors or interferences. Rather than include limits at Outfalls 002, 007, 008 and 009, the permit includes a chlorine source investigation study (Part II, Item N) to determine the source of these detections and ways to remove any interferences found. Outfall 006 must have limits because a federal effluent guideline limit applies to the cooling tower blowdown portion of the discharge.

Bis(2-ethylhexyl)phthalate (bis-2EHP) is a common contaminant found in the tubing of automatic sampling equipment. It can also be present in plastic sampling containers. Most of the plant outfalls have

had some detection of this parameter. The Ohio EPA risk assessment (Tables 15-20) places bis-2EHP in group 5 for some outfalls, 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 these outfalls may not be representative of its actual levels in the plant effluents because they were based on 1-2 data points. Also, the company samples may not have been collected in proper sampling containers. 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.

The permit contains the effluent guideline prohibition on discharges of polychlorinated biphenyl compounds (PCBs) in Part II, Item H. The permit contains the effluent guideline prohibition on detectable discharges of priority pollutants in Part II, Item I. This latter prohibition also applies to chromium and zinc, making numeric limitations for these pollutants unnecessary.

For several outfalls, the flows used to set loading limits vary for different parameters. In general, loads for treatment technology-based limits are based on the treatment plant design flow, or current loading limits. Loading limits for water quality-based limits are based on a reasonable measure of average flow as required by Ohio rules.

Outfall 001
Limits for this outfall are the same as those in the current permit. Monitoring requirements would change, with some parameters being removed and others added.

The limits for total suspended solids (TSS), oil&grease, and pH are based on the Best Practicable Treatment (BPT) effluent guidelines for the Steam Electric Power Industry – Fly Ash Transport wastewater. While Ohio Power has not transported ash to this treatment system for 10 years, the water discharged is in contact with old fly ash in the impoundment, and effluent guidelines are judged to be still applicable. The pH limits are BPT limits, rather than WQS, because the receiving water, Stingy Run, is designated LRW because of acid mine drainage in the watershed. The BPT limits represent an improvement in the background conditions of pH, and apply until the impoundment is closed. The impoundment closure is anticipated to occur before the abandoned mine land in the watershed is reclaimed.

The Ohio EPA risk assessment (Table 15) places zinc in group 5, which recommends limits to protect water quality. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), we are proposing monitoring, rather than limits, for these pollutants. The PEQ values calculated for zinc at this outfall may not be representative of its actual levels in the plant effluent they were based on six 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.

The current monitoring requirements for cobalt, copper, mercury and nickel would be removed because these pollutants do not have the reasonable potential to contribute to exceedances of WQS.

Outfall 002
Limits and monitoring requirements for the sewage treatment plant are very similar to the current requirements. The limits proposed for dissolved oxygen, total suspended solids, ammonia-nitrogen and 5-day carbonaceous biochemical oxygen demand ($CBOD_5$) are all based on plant design criteria. These

limits, based on Best Available Demonstrated Control Technology (BADCT) standards for sewage treatment, are protective of WQS.

Limits proposed for pH, and fecal coliform are based on WQS (OAC 3745-1-07). Limits for *E. coli* are based on ORSANCO standards. Ohio EPA is using the seasonal average as the monthly average limit for *E. coli*. The 7-day limit was derived from the average using the statistical methods in U.S. EPA's *Technical Support Document for Water Quality-based Toxics Control*. These limits apply April-October to coincide with ORSANCO's recreation season.

The Ohio EPA risk assessment (Table 16) places copper in group 5. This placement as well as the data in Tables 3, 9 and 11 indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For these parameters, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC Rule 3745-33-07(A)(1). The daily maximum limit is based on the new WLA. The permit contains a 12- month compliance schedule to allow Ohio Power time to meet the lower limit.

Outfall 006
Several limits at this outfall would be the same as those in the current permit – Oil&grease, pH, and the monthly TSS limit. The oil&grease and TSS limits are based on the federal effluent guidelines for Bottom Ash Transport and Low Volume wastewaters. The pH limits are based on WQS.

The maximum TSS limits were revised based on a reassessment of the FEG maximum limits. Outfall 006 includes coal pile runoff, which has a lower maximum TSS limit than the other wastewaters in this outfall (50 mg/l vs 100 mg/l). The coal pile area does not have a convenient place to sample the wastewater; therefore maximum TSS limits at Outfall 006 need to be reduced to account for the percentage of coal pile runoff in the final discharge.

To do this, Ohio EPA reviewed the average flow figures provided in the company's application (flow diagram):

Cooling Tower	11.52 MGD
Bottom Ash	7.24
Low Volume	8.39
Coal Pile	0.17
Fly Ash Sump	0.53
Total	27.85

The maximum TSS limit was calculated using the following formula:

TSS = [(100 mg/l x (11.52+7.24+8.39+0.53))+(50 mg/l x 0.17 MGD)]/27.85 MGD = 99 mg/l. The maximum load would be reduced by a corresponding amount. The use of average flows is appropriate in this case because of the extensive recycling of flows from the ponds back to the plant.

Limits for residual chlorine are needed because the effluent guidelines for cooling tower blowdown contain limits for free available chlorine (FAC). Using the same formula to calculate a maximum effluent guideline limit for Outfall 006:

FAC = 0.5 x 11.52/27.85 = 0.2 mg/l.

We have included the water quality based limit for total residual chlorine because that limit (0.038 mg/l) is more restrictive than 0.2 mg/l free available chlorine. The proposed 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. Ohio EPA cannot authorize discharge of a pollutant greater than WQS. The effluent limit for residual chlorine at this outfall is less than the quantification level of 0.050 mg/l. The quantification level is defined as the compliance level in Part II M of the permit. This quantification level language is required by OAC 3745-33-07(C).

The Ohio EPA risk assessment (Table 17) places copper and mercury in group 5. This placement as well as the data in Tables 4, 9 and 11 indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For these parameters, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC Rule 3745-33-07(A)(1). The copper limit is based on IMZM WQS; the mercury limits are WQS at the discharge point. No mixing zone is allowed for bioaccumulative chemicals of concern. Because Ohio Power cannot currently meet these limits, the permit contains a 42 month compliance schedule to allow time to consider treatment alternatives and meet the limits.

Internal Monitoring Station 606

This new monitoring point would be included in the permit to evaluate compliance with Best Available Technology (BAT) limits for copper and iron for chemical metal cleaning wastewaters. The draft permit does not contain the BPT limits for TSS and oil&grease because the discharge from this treatment process goes into the treatment ponds for Outfall 006, where additional removal is likely to occur. Consistent with 40 CFR 122.45(h), effluent guideline limits are applied at this outfall to ensure that these treatment standards are met prior to combining with other waste streams. If monitoring was not done at this location, it would not be possible to verify compliance with these standards due to dilution. Federal rules at 40 CFR 125.3(f) prohibit attaining these standards by dilution.

Outfall 007

The current limits for TSS and pH would be retained in the new permit. TSS limits are based on the design of the treatment pond. The pH limits are based on Ohio WQS.

The Ohio EPA risk assessment (Table 17) places mercury and selenium in group 5. This placement as well as the data in Tables 5, 9 and 11 indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For these parameters, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC Rule 3745-33-07(A)(1). The thirty day average limit for selenium is based on the Ohio River WLA. The monthly average limits for mercury are WQS at the discharge point. The permit contains a 48-month compliance schedule to allow time for Ohio Power to evaluate treatment options and meet the monthly average limits.

The permit also includes a numeric treatment technology-based daily maximum limit for mercury based on best professional judgment of best available technology (BPJ-BAT). Ohio EPA has determined that the best technology is settling followed by vertical flow wetlands, but that the technology is not immediately available to the facility. Ohio EPA has determined that the technology can be available to the facility in 48 months which reflects the time necessary for the planning, designing, bidding, constructing, etc. of the technology. The daily maximum limit becomes effective 48 months from the effective date of the permit consistent with then Ohio EPA has determined the technology becomes available to the facility.

The Ohio EPA risk assessment (Table 17) places ammonia-nitrogen and arsenic in group 5, which recommends limits to protect water quality. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), we are proposing monitoring, rather than limits, for these pollutants. The PEQ values calculated for these parameters may not be representative of its actual levels in the plant effluent they were based on six data points, and the fact that none of the data points exceed the WLA. The purpose of the proposed monitoring is to collect additional data on the frequency of occurrence and variability of these pollutants in the plant's effluent.

Ohio EPA risk assessment (Table 17) places TDS in group 4. This placement as well as the data in Tables 5, 9 and 11 supports that these parameters do not have the reasonable potential to contribute to WQS exceedances, and that limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC Rule 3745-33-07(A)(2).

The current monitoring requirement for boron would be removed because boron discharges do not have the reasonable potential to contribute to exceedances of WQS.

Outfall 008

The current limits for TSS and pH would be retained in the new permit. TSS limits are based on the design of the treatment pond. The pH limits are based on Ohio WQS.

The Ohio EPA risk assessment (Table 18) places mercury in group 5. This placement as well as the data in Tables 6, 9 and 11 indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality.

To comply with mercury limits, the permittee has applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the OAC. Based on the results of low-level mercury monitoring, the permittee has determined that its wastewater treatment plant cannot meet the 30-day average water

quality-based effluent limit (WQBEL) of 12 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 Z and AA 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 131 ng/l, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee make reasonable progress to meet the WQBEL for mercury by implementing the plan of study, which has been developed as part of the Pollutant Minimization Program (PMP). This plan of study also includes the evaluation of emerging treatment systems to reduce mercury discharges;
- 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.

Ohio EPA risk assessment (Table 18) places arsenic and selenium in group 4. This placement as well as the data in Tables 6, 9 and 11 supports that these parameters do not have the reasonable potential to contribute to WQS exceedances, and that limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC Rule 3745-33-07(A)(2).

In addition, the selenium effluent quality falls within 75 percent of the wasteload allocation. Under OAC 3745-33-07(A)(2), parameters in this range must have a tracking requirement in the permit that specifies reductions in pollutant concentrations if effluent concentrations exceed the WLA. The tracking/reduction requirements are included in Part II Item _ of the draft permit.

The draft permit also contains monitoring requirements for TDS, chloride and sulfate to characterize the effluent, and assist in toxicity identification/reduction efforts.

Outfall 009

The current limits for TSS and pH would be retained in the new permit. TSS limits are based on the design of the treatment pond. The pH limits are based on Ohio WQS.

The Ohio EPA risk assessment (Table 19) places selenium in group 5. This placement as well as the data in Tables 7, 9 and 11 indicate that the reasonable potential to exceed WQS exists and limits are necessary

to protect water quality. For these parameters, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC Rule 3745-33-07(A)(1). The thirty day average limit for selenium is based on the Ohio River WLA. The permit contains a 48 month compliance schedule to allow time to consider treatment alternatives and meet the limits.

The Ohio EPA risk assessment (Table 19) places ammonia-nitrogen in group 5, which recommends limits to protect water quality. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), we are proposing monitoring, rather than limits, for these pollutants. The PEQ values calculated for ammonia-N may not be representative of its actual levels in the plant effluent they were based on six data points. Also, all of the individual data points were well below the WLA. 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.

While there is no available effluent data for mercury at this outfall, we have included limits based on the similarities between this outfall and Outfall 007. Outfall 007 has the reasonable potential to contribute to exceedances of mercury WQS, and has similar wastewater characteristics and treatment systems.

Ohio EPA risk assessment (Table 19) places TDS and copper in group 4. This placement as well as the data in Tables 7, 9 and 11 supports that these parameters do not have the reasonable potential to contribute to WQS exceedances, and that limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC Rule 3745-33-07(A)(2).

Monitoring requirements for boron would be removed because boron discharges do not have the reasonable potential to contribute to exceedances of WQS.

Proposed Outfalls 010 / 011

The TSS limits for these new discharges are based on the design limits for Outfalls 007-009. Outfall 010 limits are shown in the table in Part I. A. of the permit because this outfall will begin discharging during the life of this permit. Outfall 011 will not begin discharging until 2020, after this permit expires. However, due to Antidegradation Rule requirements, limits for Outfall 011 must be included in the permit. These are included in narrative form in Part II, Item CC.

Limits for pH are based on WQS.

Ohio EPA evaluated this proposed discharge for the reasonable potential to contribute to excursions above WQS using the WLA, projected effluent concentrations from the company's Form 2D application and data from similar outfalls, particularly Outfalls 007 and 009.

Based on the evaluation of this data, Ohio EPA is proposing water quality-based limits for TDS, ammonia-nitrogen (summer), and mercury. The Form 2D data (Table 8) show that effluent concentrations for TDS, ammonia-N (summer) and mercury will likely be exceeded in the absence of limits. The Table 8 data, combined with data from the other landfill outfalls, indicate that arsenic and selenium will approach, and could exceed WLA values. As a result, Ohio EPA has included limits for all of these parameters in the draft permit.

WQ-based limits for these outfalls are different from the existing outfalls because the receiving waters for Outfalls 010 (unnamed tributary to Turkey Run) and Outfall 011 (unnamed tributary of Stingy Run) are not designated in the Ohio WQS, and therefore must be protected using criteria to protect the WWH use. The draft permit limits in the permit protect these criteria in the tributary. Ohio EPA intends to set a designated use for this tributary during the life of this permit. If that evaluation shows that the designated use should be LRW (as many of the streams in the Kyger Creek watershed are), limits could be modified to protect only the LRW criteria.

Ohio EPA and Ohio Power have discussed the possibility of Outfalls 010 and 011 discharging directly to Turkey Run and Stingy Run, respectively. If these discharges are routed to these streams, effluent limits for ammonia and TDS would not be needed because average WQS for aquatic life do not apply to streams designated LRW.

Ohio Power is proposing engineered wetlands as the treatment systems for these outfalls. Pilot testing of these systems indicates that, when fully functional, they will likely meet the 12 ng/l monthly average WQS; however, the company has requested an interim mercury variance for these outfalls to allow time for plant growth in the proposed engineered wetland treatment systems, and to evaluate whether treatment beyond the wetlands will be needed to meet WQS. Ohio EPA has included a 12-month mercury variance for these outfalls in the draft permit to allow for these evaluations and improvements. The 30-day variance limit of 79 ng/l is based on the effluent quality of Outfall 007 (as measured by the PEQavg.).

Monitoring would be required for ammonia-N (winter), copper, chloride and sulfate to assess whether the discharge has reasonable potential for these pollutants. Ohio EPA is not proposing maximum discharge limits for sulfate or chloride in this discharge because the sensitive organisms that those criteria are used to protect are not likely to be present. Ohio EPA is setting a maximum acute toxicity limit for water flea species to protect narrative WQS for aquatic toxicity.

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.

Whole Effluent Toxicity Reasonable Potential
Based on evaluating the WET data presented in Table 10 and other pertinent data under the provisions of OAC 3745-33-07(B), the Gavin Outfalls 001 and 006 are placed in Category 4 with respect to whole effluent toxicity; Outfalls 007-011 are placed in Category 1 with respect to whole effluent toxicity.

Outfalls 001 and 006 have not shown acute toxicity – Outfall 001 has had no significant toxicity in the last four years (17 test results), and Outfall 006 has not shown toxicity in any of the tests conducted during the last permit cycle. These outfalls do not have the reasonable potential to contribute to exceedances of narrative toxicity standards. Testing requirements for these outfalls would be removed in the new permit. Based on the WLAs for these outfalls presented above and normal acute-to-chronic ratios for effluents ($\leq$18:1) acute toxicity is considered the limiting factor at these outfalls, and chronic testing is not needed.

Outfall 008 has shown the reasonable potential to contribute to exceedances of toxicity WQS. Factors pointing to reasonable potential include: (1) the relatively high percentage of test results exceeding the WLA (42%); (2) three test results that exceeded the WLA by a factor of 2 or more; (3) effluent chemical

results for TDS and chloride that are often associated with acute toxicity values >1.0 TUa; and (4) an impairment of the LRW stream use measured biologically downstream from Outfall 008 during the last Ohio EPA survey. All of these factors point to the need for limits. Again, based on the toxicity WLA, acute toxicity is the limiting toxicity factor and chronic toxicity tests are not needed. A 42-month compliance schedule is included in the draft permit to allow time to meet the discharge limit. The timing of this schedule is intended to dovetail with the compliance schedules for chemical-specific limits so that solutions to both issues may be coordinated.

While there is no toxicity data for Outfalls 007 and 009, Ohio EPA is including these outfalls in the compliance schedule requirements because the effluent chemical results strongly suggest that these outfalls have reasonable potential for acute toxicity if Outfall 008 does. The likely cause of toxicity at Outfall 008 is the discharge of TDS and its constituents. The chemical data for Outfalls 007 and 009 indicate that these pollutant parameters are similar or higher in Outfalls 007/009 than they are in Outfall 008. This makes it likely that Outfalls 007 and 009 are acutely toxic. Based on this, we have included acute toxicity limits for these outfalls, and included them in the compliance schedule for toxicity.

At Ohio Power's request, Ohio EPA is allowing the use of *Daphnia magna*, rather than *Ceriodaphnia*, as the test organism. Ohio Power has submitted data to indicate that *D. magna* is similar to *Ceriodaphnia* in sensitivity to TDS. While Ohio EPA is uncertain that the data makes this point, other data available to the Agency indicates that *D. magna* toxicity results are protective of streams with use designations less than WWH. Specifically, data for Dicks Creek shows that Modified Warmwater Habitat communities are attained in conjunction with a steel finishing discharge that routinely meets chronic toxicity limits for *D. magna*. Historically, Ohio Electropolishing Company met biological performance benchmarks for LRW while meeting acute toxicity limits using D. magna. Based on this information, Ohio EPA is proposing to use *D. magna* for acute toxicity testing for these outfalls. Fathead minnow testing is not being required because the existing test data show that daphnids are consistently more sensitive to the discharges than fish are.

By extension, new Outfalls 010 and 011 are also likely to have acute toxicity if the same level of control is applied to this outfall, as it has been to Outfalls 007-009. These outfalls would be limited to 1.0 TUa from the start of discharge. Limits on chronic toxicity are not included because chemical-specific limits given for TDS and other pollutant parameters are likely to ensure that chronic standards are protected in the unnamed tributary.

Other Requirements

Operator Certification
Operator certification requirements have been included in Part II A. of the permit in accordance with rules adopted in December 2006. These rules require the Ohio Power Gavin to have a Class A wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 002.

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 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 the treatment works.

Storm Water Compliance
The draft permit contains storm water control, pollution prevention and monitoring language in Parts IV, V and VI of the draft permit. The permit contains monitoring for zinc at some of the storm water outfalls, and benchmark concentrations because the Form 2F application data shows that some of these outfalls contain zinc concentrations greater than IMZM values. These benchmarks are not effluent limitations, they identify the goals of the storm water pollution prevention plans. The goal for Ohio Power Gavin is to meet the benchmark concentrations as an annual average within four years from the effective date of the permit. The role of the benchmarks is to guide when further controls or pollution prevention are warranted. A permittee may make and justify a finding that no further controls are technically feasible or economically reasonable.

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

Section 316(b) Compliance
The current permit for Gavin Plant required Ohio Power to submit the following information with this application:

- Intake design flow;
- Percentage of intake flow used for cooling purposes;
- Estimate of the intake flow reduction at the facility based on the use of a 100% closed-cycle re-circulating cooling system compared to a conventional once-through cooling system;
- The through screen design intake flow velocity;
- A detailed description of any changes in the operation of the intake structure, or changes in the type of technologies used at the intake structure such as screens or other technologies affecting rates of impingement and/or entrainment of fish.

The current application provides these responses:

- Design intake flow of the intake structure = 43.25 MGD;
- Percentage of intake flow used for cooling = 92.5%;
- Facility is already at 100% closed-cycle recirculating cooling water use;
- Through screed design intake velocity = 0.38 feet/sec (estimated);
- No change in intake structure or design since operation began in 1974.

Ohio EPA believes that these facts make the case that this intake structure is Best Technology Available. The through-screen velocity meets the federal New Source criterion (<0.5 feet/sec), and 100% of cooling water is recirculated. These factors make it unlikely that there is any significant impingement of fish at Gavin Plant.

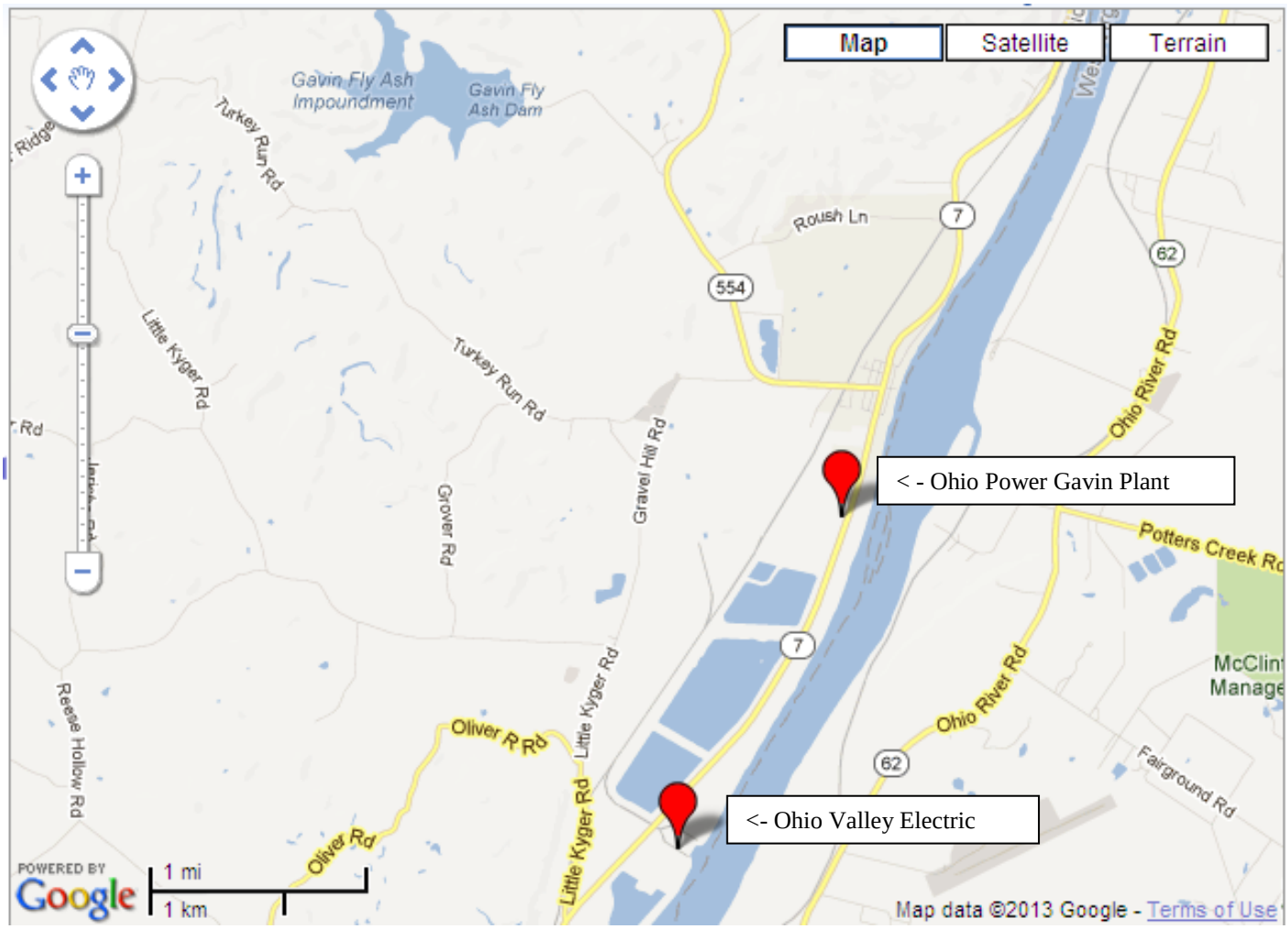

Figure 1. Approximate location of the Gavin Plant.

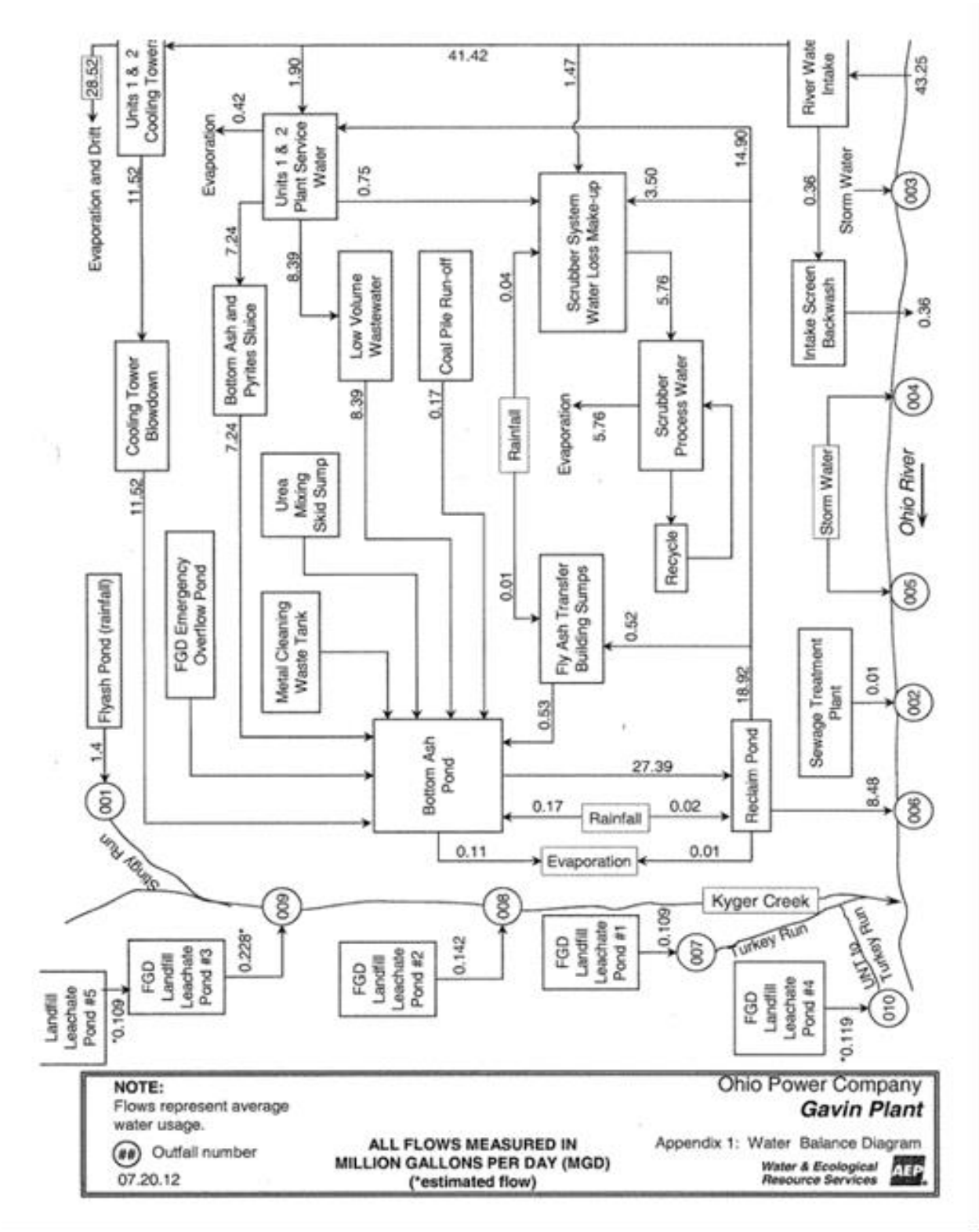

Figure 2. Water Balance Diagram for the Ohio Power Gavin Plant

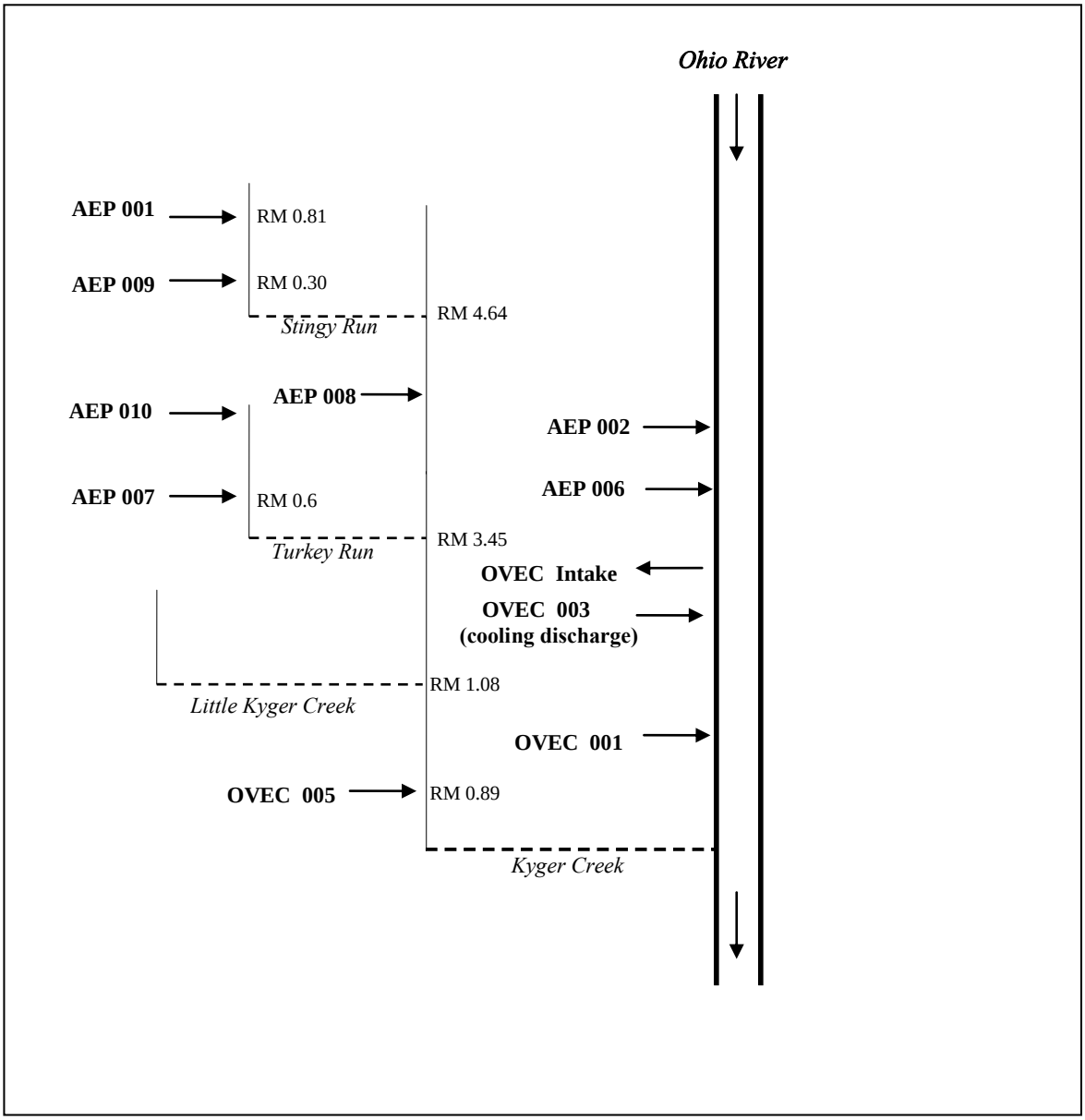

Figure 3. Kyger Creek Study Area. Outfalls are identified for AEP's Ohio Power Gavin Plant and Ohio Valley Electric Corporation's Kyger Creek Plant.

Table 2. Effluent Characterization Using Ohio EPA Data and NPDES Application Form 2C Data – Outfall 001

Summary of analytical results for the Ohio Power Gavin outfall 0IB00006001. All values are in µg/l unless otherwise indicated. 2C = Data from application form 2C; Ohio EPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

PARAMETER	Ohio EPA 07/10/08	Ohio EPA 08/11/08	Ohio EPA 09/03/08	Ohio EPA 09/22/08	Ohio EPA 10/09/08	Ohio Power App. Form 2C N	mean	max.	DECISION CRITERIA PEQ_{avg}	PEQ_{max}
BOD5 mg/l	NA	NA	NA	NA	NA	1	--	2.8		
COD mg/l	<10	12	<10	<10	<10	1	--	<5		
Sus. Solids mg/l	31	5	5	26	46	1	--	<10		
Diss. Solids mg/l	596	584	588	634	760	NA	NA	NA	1276	1748
Chloride mg/l	<5	<5	<5	<5	7.4	NA	NA	NA	12.41	17.02
Sulfate mg/l	381	392	340	347	446	1	--	336	684	937
Hardness mg/l	329	342	336	356	436	NA	NA	NA		
Fluoride mg/l	NA	NA	NA	NA	NA	1	--	0.35	0.549	0.677
Ammonia-N mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	1	--	0.07	0.107	0.147
NO3/NO2-N mg/l	0.15	0.12	0.12	0.14	<0.10	1	--	<0.2	0.23	0.315
Kjeldahl N mg/l	<0.20	1.19	<0.02	<0.02	<0.02	1	--	<0.5		
Phosphorus mg/l	<0.010	<0.010	<0.010	<0.010	<0.010	1	--	0.06	0.092	0.126
Chlorine, TR mg/l	NA	NA	NA	NA	NA	1	--	0.04	0.181	0.248
Aluminum	1320	1190	1020	2420	3070	1	--	164	4706	6447
Antimony	NA	NA	NA	NA	NA	1	--	0.05	0.226	0.31
Arsenic	<2.0	<2.0	<2.0	<2.0	<2.0	1	--	0.99	3.07	4.20
Barium	26	26	26	29	37	1	--	19	57	78
Beryllium	NA	NA	NA	NA	NA	1	--	0.09	0.41	0.56
Boron	NA	NA	NA	NA	NA	1	--	1010	1689	2035
Cadmium	0.46	0.44	0.41	0.36	0.38	1	--	0.08	0.70	0.97

Table 2. continued

PARAMETER	Ohio EPA 07/10/08	Ohio EPA 08/11/08	Ohio EPA 09/03/08	Ohio EPA 09/22/08	Ohio EPA 10/09/08	Ohio Power App. Form 2C N	mean	max.	DECISION CRITERIA PEQ_{avg}	PEQ_{max}
Chromium	<2.0	<2.0	<2.0	<2.0	<2.0	1	--	0.4	1.81	2.48
Cobalt	NA	NA	NA	NA	NA	1	--	4.9	39.4	54.0
Copper	2.3	2.0	<2.0	3.3	4.4	1	--	1.32	5.22	7.15
Iron	138	<50	110	319	730	1	--	75	1119	1533
Lead	<2.0	<2.0	<2.0	<2.0	<2.0	1	--	0.17	0.77	1.05
Magnesium mg/l	26	26	27	24	32	1	--	19.4	49.1	67.2
Manganese	4050	4170	3840	2800	2750	1	--	949	6393	8757
Molybdenum	NA	NA	NA	NA	NA	1	--	30.1	139.2	186.6
Nickel	72.2	65.7	57.3	52.8	59.4	1	--	12.0	52.7	72.2
Potassium mg/l	3	3	3	3	5	NA	NA	NA	8	12
Strontium	445	460	495	511	772	NA	NA	NA	1296	1776
Thallium	NA	NA	NA	NA	NA	1	--	0.39	1.76	2.42
Titanium	NA	NA	NA	NA	NA	1	--	1.1	5.0	6.8
Zinc	132	119	80	152	157	1	--	17.7	240.7	329.7

Table 3. Effluent Characterization Using Ohio EPA Data and NPDES Application Form 2C Data – Outfall 002

Summary of analytical results for the Ohio Power Gavin outfall 0IB00006002. All values are in µg/l unless otherwise indicated. 2C = Data from application form 2C; Ohio EPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

	Ohio Power App. Form 2C			DECISION CRITERIA	
PARAMETER	N	mean	max.	PEQ_{avg}	PEQ_{max}
BOD5 mg/l	1	--	2.8		
COD mg/l	1	--	14		
Sulfate mg/l	1	--	100	453	620
Fluoride mg/l	1	--	0.82	0.86	1.05
Ammonia-N mg/l	1	--	0.12	0.59	1.07
NO3/NO2-N mg/l	1	--	96.9	438.6	600.8
Kjeldahl N mg/l	1	--	0.92		
Phosphorus mg/l	1	--	5.54	25.07	34.35
Chlorine, TR mg/l	1	--	0.12	0.54	0.74
Aluminum	1	--	14	63	87
Antimony	1	--	0.39	1.76	2.42
Arsenic	1	--	2.73	12.36	16.93
Barium	1	--	13	59	81
Boron	1	--	397	1797	2461
Cadmium	1	--	0.07	0.32	0.43

Table 3. continued

PARAMETER	Ohio Power App. Form 2C N	mean	max.	DECISION CRITERIA PEQ_{avg}	PEQ_{max}
Copper	1	--	16.8	44.7	65.6
Iron	1	--	24	109	149
Lead	1	--	0.063	0.285	0.391
Magnesium mg/l	1	--	13.8	62.5	85.6
Manganese	1	--	6.2	28.1	38.4
Nickel	1	--	5.3	24.0	32.9
Selenium	1	--	1.2	5.4	7.4
Thallium	1	--	0.06	0.27	0.37
Zinc	1	--	13.5	61.1	83.7
Bis(2-ethylhexyl)-Phthalate	1	--	49.9	225.8	309.4

Table 4. Effluent Characterization Using Ohio EPA Data and NPDES Application Form 2C Data – Outfall 006

Summary of analytical results for the Ohio Power Gavin outfall 0IB00006006. All values are in µg/l unless otherwise indicated. PT = data from, pretreatment program reports; 2C = Data from application form 2C; Ohio EPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

	Ohio Power App. Form 2C			DECISION CRITERIA	
PARAMETER	N	mean	max.	PEQ_{avg}	PEQ_{max}
BOD5 mg/l	1	--	11.7		
COD mg/l	1	--	17		
Sus. Solids mg/l	1	--	24		
Temperature ^{o}C	1	--	20		
Oil & grease mg/l	1	--	5.2		
Sulfate mg/l	1	--	417	1887	2585
Fluoride mg/l	1	--	0.44	1.05	1.55
Ammonia-N mg/l	1	--	0.17	5.79	7.93
NO3/NO2-N mg/l	1	--	6.32	28.60	39.18
Kjeldahl N mg/l	1	--	1.57		
Phosphorus mg/l	1	--	0.17	0.77	1.05
Chlorine, TR mg/l	1	--	0.68	3.08	4.22
Aluminum	1	--	958	4336	5940
Antimony	1	--	0.44	1.99	2.73
Arsenic	1	--	5.35	24.21	33.17
Barium	1	--	127	575	787
Beryllium	1	--	0.11	0.50	0.68
Boron	1	--	359	839	1304
Cadmium	1	--	0.18	0.82	1.12
Chromium	1	--	2.8	12.7	17.4

Table 4. continued

PARAMETER	Ohio Power App. Form 2C N	mean	max.	DECISION CRITERIA PEQ_{avg}	PEQ_{max}
Cobalt	1	--	2	9	12
Copper	1	--	18.2	31.6	40.6
Iron	1	--	1500	6789	9300
Lead	1	--	1.45	6.56	8.99
Magnesium mg/l	1	--	31.1	140.8	192.8
Manganese	1	--	237	1073	1469
Molybdenum	1	--	4.4	19.9	27.3
Nickel	1	--	7.24	32.77	44.89
Selenium	1	--	2.2	4.1	5.5
Silver	1	--	0.017	0.077	0.105
Thallium	1	--	0.5	2.3	3.1
Zinc	1	--	8.7	39.4	53.9
Cyanide, T.	1	--	12.5	56.6	77.5
Methylene Chloride	1	--	1.18	5.34	7.32
Bis(2-ethylhexyl)-Phthalate	1	--	58.7	265.7	363.9

Table 5. Effluent Characterization Using Ohio EPA Data and NPDES Application Form 2C Data – Outfall 007

Summary of analytical results for the Ohio Power Gavin outfall 0IB00006007. All values are in µg/l unless otherwise indicated. 2C = Data from application form 2C; Ohio EPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

	Ohio EPA	Ohio EPA	Ohio EPA	Ohio EPA	Ohio EPA	Ohio Power App. Form 2C			DECISION CRITERIA	
PARAMETER	07/10/08	08/11/08	09/03/08	09/22/08	10/09/08	N	mean	max.	PEQ_{avg}	PEQ_{max}
BOD5 mg/l	NA	NA	NA	NA	NA	1	--	6.1		
COD mg/l	250	111	<100	228	63	1	--	14		
Sus. Solids mg/l	18	18	6	8	5	1	--	<20		
Diss. Solids mg/l	6380	5580	7090	10900	11000	NA	NA	NA	18469	25300
Chloride mg/l	2650	1500	2470	3580	3640	NA	NA	NA	6112	8372
Sulfate mg/l	1200	1410	1330	1270	1370	1	--	744	2162	2961
Hardness mg/l	3560	2620	3550	5700	5010	NA	NA	NA		
Ammonia-N mg/l	2.35	1.19	3.12	4.45	5.49	1	--	1.64	8.42	11.53
NO3/NO2-N mg/l	0.19	0.17	0.11	0.11	<0.10	1	--	1.17	1.79	2.46
Nitrite-N mg/l	0.162	0.127	0.230	0.336	0.327	NA	NA	NA	0.56	0.77
Kjeldahl N mg/l	4.19	4.11	7.62	6.44	7.15	1	--	2.64		
Phosphorus mg/l	0.011	0.047	0.492	0.018	0.028	1	--	0.14	0.75	1.03
Chlorine, TR mg/l	NA	NA	NA	NA	NA	1	--	0.16	0.72	0.99
Aluminum	403	253	<200	<200	<200	1	--	116	618	846
Antimony	NA	NA	NA	NA	NA	1	--	0.72	3.26	4.46
Arsenic	37.5	25.7	38.8	59.4	61.9	1	--	32.6	94.9	130.0
Barium	103	96	121	152	157	1	--	77	241	330
Boron	NA	NA	NA	NA	NA	1	--	2390	6234	8540
Cadmium	0.24	<0.20	0.21	0.28	0.32	1	--	<0.05	0.49	0.67

Table 5. continued.

PARAMETER	Ohio EPA 07/10/08	Ohio EPA 08/11/08	Ohio EPA 09/03/08	Ohio EPA 09/22/08	Ohio EPA 10/09/08	Ohio Power App. Form 2C N	mean	max.	DECISION CRITERIA PEQ_{avg}	PEQ_{max}
Cobalt	NA	NA	NA	NA	NA	1	--	1.8	8.1	11.2
Copper	6.3	5.1	7.6	8.3	8.8	1	--	0.92	13.5	18.5
Iron	339	<50	80	<50	<50	1	--	189	520	712
Lead	<2.0	2.5	<2.0	2.8	<2.0	1	--	0.196	4.3	5.9
Magnesium mg/l	16	12	14	15	15	1	--	10.1	24.5	33.6
Manganese	1310	367	1140	1740	2070	1	--	464	3173	4347
Molybdenum	NA	NA	NA	NA	NA	1	--	20.5	92.8	127.1
Nickel	20.8	14.1	25.5	32.1	28.7	1	--	2.7	49.2	67.4
Potassium mg/l	367	234	325	604	579	NA	NA	NA	1014	1389
Selenium	49	41.4	64	92.4	84.4	1	--	8.8	141.6	194.0
Strontium	7260	4090	6460	11900	11300	NA	NA	NA	9658	12230
Thallium	NA	NA	NA	NA	NA	1	--	0.15	0.68	0.93
Titanium	NA	NA	NA	NA	NA	1	--	1.9	8.6	11.8
Zinc	<10	<10	<10	<10	<10	1	--	12.6	19.3	26.5
Methylene Chloride	NA	NA	NA	NA	NA	1	--	1.06	4.80	6.57
Bis(2-ethylhexyl)-Phthalate	NA	NA	NA	NA	NA	1	--	14.9	67.4	92.4

Table 6. Effluent Characterization Using Ohio EPA Data and NPDES Application Form 2C Data – Outfall 008

Summary of analytical results for the Ohio Power Gavin outfall 0IB00006008. All values are in µg/l unless otherwise indicated. 2C = Data from application form 2C; Ohio EPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results. Ohio EPA results for 11/27/12 are averages of two grab samples taken during the day.

PARAMETER	Ohio EPA 07/10/08	Ohio EPA 08/11/08	Ohio EPA 09/03/08	Ohio EPA 09/22/08	Ohio EPA 11/27/12	Ohio Power App. Form 2C N	mean	max.	DECISION CRITERIA PEQ_{avg}	PEQ_{max}
BOD5 mg/l	NA	NA	NA	NA	NA	1	--	26.9		
COD mg/l	20	50	27	29	NA	1	--	7		
Sus. Solids mg/l	15	<5	<5	<5	<5	1	--	<20		
Diss. Solids mg/l	2460	2790	3330	3330	4965	NA	NA	NA	8336	11420
Chloride mg/l	461	592	770	773	1615	NA	NA	NA	2712	3714
Sulfate mg/l	1010	1180	1330	1050	1440	1	--	1450	2223	3045
Hardness mg/l	1390	1110	1650	1810	2135	NA	NA	NA		
Bromide mg/l	NA	NA	NA	NA	NA	1	--	15.7	71.1	97.3
Fluoride mg/l	NA	NA	NA	NA	NA	1	--	0.4	1.1	1.7
Ammonia-N mg/l	0.455	0.447	0.669	0.549	1.78	1	--	1.27	2.73	3.74
NO3/NO2-N mg/l	0.23	1.26	0.65	1.60	0.30	1	--	0.65	2.69	3.68
Nitrite-N	0.085	0.469	0.556	0.993	NA	NA	NA	NA	1.885	2.582
Kjeldahl N mg/l	1.47	1.92	2.39	2.67	NA	1	--	1.27		
Phosphorus mg/l	0.174	0.258	0.437	0.316	0.011	1	--	<0.05	0.73	1.01
Chlorine, TR mg/l	NA	NA	NA	NA	NA	1	--	0.06	0.27	0.37
Sulfide mg/l	NA	NA	NA	NA	NA	1	--	9.8	44.4	60.8
Aluminum	<200	<200	<200	<200	<200	1	--	43	195	267
Antimony	NA	NA	NA	NA	NA	1	--	0.5	2.3	3.1
Arsenic	5.9	8.2	16.6	11.4	53	1	--	37.4	81.2	111

Table 6. continued

PARAMETER	Ohio EPA 07/10/08	Ohio EPA 08/11/08	Ohio EPA 09/03/08	Ohio EPA 09/22/08	Ohio EPA 11/27/12	Ohio Power App. Form 2C N	mean	max.	DECISION CRITERIA PEQ_{avg}	PEQ_{max}
Barium	72	96	145	166	86.5	1	--	107	279	382
Beryllium	NA	NA	NA	NA	NA	1	--	0.021	0.095	0.13
Boron	NA	NA	NA	NA	NA	1	--	5030	4533	5810
Cadmium	<0.20	<0.20	<0.20	<0.20	<0.20	1	--	0.1	0.34	0.46
Chromium	<2.0	<2.0	<2.0	2.1	<2.0	1	--	<0.2	3.5	4.8
Cobalt	NA	NA	NA	NA	NA	1	--	1.5	6.8	9.3
Copper	2.5	5.4	5.9	7.1	6.95	1	--	2.25	11.9	16.3
Iron	62	<50	139	<50	185	1	--	142	284	388
Lead	<2.0	<2.0	<2.0	<2.0	<2.0	1	--	0.22	1.00	1.36
Magnesium mg/l	4	21	38	7	7	1	--	4.67	63.8	87.4
Manganese	23	77	188	42	166	1	--	39.1	315.7	432.4
Molybdenum	NA	NA	NA	NA	NA	1	--	49	222	304
Nickel	7.0	7.6	10.8	11.4	19.8	1	--	2.87	30.4	41.6
Potassium mg/l	74	85	101	134	227	NA	NA	NA	381	522
Selenium	26.6	29.8	35.8	56.2	67.6	1	--	13.5	48.9	72.0
Strontium	1440	1710	2360	2640	4090	NA	NA	NA	6867	9407
Thallium	NA	NA	NA	NA	NA	1	--	0.09	0.41	0.56
Zinc	<10	<10	<10	<10	28	1	--	6.2	42.9	58.8
Cyanide, T.	NA	NA	NA	NA	NA	1	--	5.76	26.07	35.71
Bis(2-ethylhexyl)-Phthalate	NA	NA	NA	NA	<11.1	1	--	67.6	188.	257.

Table 7. Effluent Characterization Using Ohio EPA Data and NPDES Application Form 2C Data – Outfall 009

Summary of analytical results for the Ohio Power Gavin outfall 0IB00006009. All values are in µg/l unless otherwise indicated. 2C = Data from application form 2C; Ohio EPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

	Ohio EPA	Ohio EPA	Ohio EPA	Ohio EPA	Ohio EPA	Ohio Power App. Form 2C			DECISION CRITERIA	
PARAMETER	07/10/08	08/11/08	09/03/08	09/22/08	10/09/08	N	mean	max.	PEQ_{avg}	PEQ_{max}
BOD5 mg/l	NA	NA	NA	NA	NA	1	--	45.6		
COD mg/l	120	14	<100	<100	<100	1	--	52		
Sus. Solids mg/l	12	19	7	<5	6	1	--	<20		
Diss. Solids mg/l	6020	4380	5700	7900	8710	NA	NA	NA	14624	20033
Chloride mg/l	1490	1080	1690	2460	2530	NA	NA	NA	4248	5819
Sulfate mg/l	1460	1570	1580	1680	1780	1	--	1560	2729	3738
Hardness mg/l	2270	1530	2310	3870	3370	NA	NA	NA		
Bromide mg/l	NA	NA	NA	NA	NA	1	--	14.4	65.2	89.3
Fluoride mg/l	NA	NA	NA	NA	NA	1	--	0.5	0.4	0.6
Ammonia-N mg/l	2.95	1.36	2.88	3.35	5.26	1	--	3.97	8.06	11.05
NO3/NO2-N mg/l	0.13	0.10	<0.10	0.38	0.17	1	--	<0.02	0.58	0.80
Nitrite-N mg/l	0.115	0.164	0.491	1.3	1.02	NA	NA	NA	2.18	2.99
Kjeldahl N mg/l	3.79	2.57	3.16	4.21	5.62	1	--	4.77		
Phosphorus mg/l	0.018	0.032	0.025	0.019	0.030	1	--	0.05	0.077	0.105
Chlorine, TR mg/l	NA	NA	NA	NA	NA	1	--	0.30	1.36	1.86
Oil & grease mg/l	NA	NA	NA	NA	NA	1	--	21.2		
Sulfide mg/l	NA	NA	NA	NA	NA	1	--	23.9	108.2	148.2
Aluminum	285	270	<200	<200	<200	1	--	79	437	598
Antimony	NA	NA	NA	NA	NA	1	--	1.25	5.66	7.75
Arsenic	22.5	19.4	22.5	25.2	31.3	1	--	106	52.5	72.0

Table 7. continued

PARAMETER	Ohio EPA 07/10/08	Ohio EPA 08/11/08	Ohio EPA 09/03/08	Ohio EPA 09/22/08	Ohio EPA 10/09/08	Ohio Power App. Form 2C N	mean	max.	DECISION CRITERIA PEQ_{avg}	PEQ_{max}
Barium	91	84	94	106	120	1	--	86	184	252
Boron	NA	NA	NA	NA	NA	1	--	4250	6412	8784
Cadmium	<0.20	<0.20	<0.20	<0.20	<0.20	1	--	0.06	0.27	0.37
Chromium	<20	2.4	<2.0	<2.0	<2.0	1	--	<0.2	3.7	5.0
Cobalt	NA	NA	NA	NA	NA	1	--	1.8	8.1	11.2
Copper	6.6	6.9	9.3	10.4	10.7	1	--	1.08	16.4	22.5
Iron	288	175	90	87	54	1	--	76	442	605
Lead	<2.0	<2.0	<2.0	2.9	<2.0	1	--	0.115	4.4	6.1
Magnesium mg/l	16	14	17	17	18	1	--	11.3	28	38
Manganese	881	483	405	533	950	1	--	0.4	1456	1995
Molybdenum	NA	NA	NA	NA	NA	1	--	9.2	41.6	57.0
Nickel	14.1	11.1	17.0	20.3	18.4	1	--	3.34	31.1	42.6
Potassium mg/l	309	198	320	547	542	NA	NA	NA	918	1258
Selenium	34.0	26.8	49.2	69.8	48.7	1	--	2.2	107.0	146.6
Strontium	4180	2710	4280	7190	6890	NA	NA	NA	12072	16537
Thallium	NA	NA	NA	NA	NA	1	--	0.05	0.23	0.31
Zinc	<10	<10	<10	<10	<10	1	--	9.7	15	21
Bis(2-ethylhexyl)-Phthalate	NA	NA	NA	NA	NA	1	--	40.7	184.2	252.3

Table 8. Effluent Characterization Using Ohio EPA Data and NPDES Application Form 2D Data

Summary of analytical results Ohio Power Gavin proposed outfalls 0IB000006010 and 0IB00006011. Data is estimated effluent quality data based on analytical data for Outfall 0IB00006009 All values are in µg/l unless otherwise indicated; ND = below detection (detection limit); NA = not analyzed. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

PARAMETER		Ohio Power App. Form 2D mean	max.
Flow	MGD	0.119	0.39
BOD5	mg/l	26.2	45.6
COD	mg/l	26	52
Organic Carbon, tot.	mg/l	1.50	2.09
Diss. Solids	mg/l	6070	8984
Suspended Solids	mg/l	5.8	11.6
Chloride	mg/l	1570	2355
Sulfate, T.	mg/l	1590	1733
Ammonia-N	mg/l	2.29	3.97
Nitrate/nitrite-N	mg/l	0.47	0.94
Phosphorus		0.11	0.22
Aluminum		28	30
Antimony		1.31	2.03
Arsenic		26	--
Barium		114.1	126
Boron		4070	5800
Cadmium		<0.01	0.01
Chromium		0.09	0.17
Cobalt		0.55	0.73
Copper		0.9	2.9
Lead		0.09	0.31
Magnesium	mg/l	14.3	16.9
Mercury	ng/l	2.6	3.6
Molybdenum		21.5	25.2
Nickel		1.3	1.56
Selenium		0.52	0.93
Zinc		1.5	4.5

Table 9. Effluent Characterization Using Self-Monitoring Data

Summary of current permit limits and unaltered monthly operating report (MOR) data for Ohio Power Gavin existing outfalls. All values are based on annual records unless otherwise indicated. N = Number of Analyses. ** = Fecal coliform limits for Outfall 002 – Summer: 200 avg., 400 daily; Winter: 1000 avg., 2000 daily. Decision Criteria: PEQ_{avg} = monthly average; PEQ_{max} = daily maximum analytical results.

			Current Permit Limits			Percentiles			Decision Criteria		
Parameter	**Season**	**Units**	**30 day**	**Daily**	**# Obs.**	**50th**	**95th**	**Data Range**	**# Obs.**	**PEQ_{ave}**	**PEQ_{max}**
Outfall 001											
pH	Annual	S.U.	6.0 to 9.0		71	6.8	7.7	6.1-8.8			
Total Suspended Solids	Annual	mg/l	30	100	64	3	18.7	0-28			
Total Suspended Solids	Annual	kg/day	475	1582	64	10.6	113	0-188			
Oil and Grease, Total	Annual	mg/l	15	20	66	0	2	0-4			
Oil and Grease, Total	Annual	kg/day	237	316	66	0	4.84	0-22.7			
Fluoride, Total (F)	Annual	mg/l	--	--	7	0.43	0.474	0.25-0.48	20	0.55	0.68
Fluoride, Total (F)	Annual	kg/day	--	--	7	2.36	3.68	0.45-3.96			
Cobalt, Total Recoverable	Annual	µg/l	Monitor		56	15	37	0-42	72	39	54
Cobalt, Total Recoverable	Annual	kg/day	--	--	56	0.0235	0.305	0-0.58			
Boron, Total	Annual	µg/l	--	--	7	1230	1700	1020-1730	20	1689	2035
Boron, Total	Annual	kg/day	--	--	7	9.06	11.8	1.3-12.1			
Cobalt, Total (Co)	Annual	µg/l	--	--	7	44	46.7	29-47			
Cobalt, Total (Co)	Annual	kg/day	--	--	7	0.243	0.402	0.0395-0.446			
Nickel, Total Recoverable	Annual	µg/l	Monitor		57	31	57.2	0-67	59	52.7	72.2
Nickel, Total Recoverable	Annual	kg/day	--	--	57	0.0615	0.535	0-0.966			
Copper, Total Recoverable	Annual	µg/l	Monitor		57	0	0.664	0-31	25	5.2	7.15
Copper, Total Recoverable	Annual	kg/day	--	--	57	0	0.00332	0-0.0141			
Flow Rate	Annual	MGD	Monitor		1302	0.8	3.77	0.01-79			
Mercury, Total (Low Level)	Annual	ng/l	Monitor		31	0.6	2.15	0-2.4	28	2.1	2.9
Mercury, Total (Low Level)	Annual	kg/day	--	--	31	8.33E-08	9.66E-06	0-0.0000121			

Acute Toxicity, Ceriodaphnia dubia	Annual	TUa	Monitor		19	0	2.4	0-3.3		
Acute Toxicity, Pimephales promelas	Annual	TUa	Monitor		18	0	0.275	0-0.7		

Outfall 002

Color, Severity	Annual	Units	Observation		1184	0	0	0-0		
Dissolved Oxygen	Summer	mg/l	--	5.0 min	12	7.22	8.98	5.7-9.2		
Dissolved Oxygen	Winter	mg/l	--	5.0 min	13	9.39	11.5	5.5-11.6		
pH	Annual	S.U.	6.5 to 9.0		56	7	7.53	6.6-7.9		
Total Suspended Solids	Annual	mg/l	12	18	25	3	6.6	1-12		
Total Suspended Solids	Annual	kg/day	1.09	1.64	25	0.0908	0.241	0.0189-0.246		
Nitrogen, Ammonia (NH3)	Summer	mg/l	2	3	12	0.19	0.367	0.04-0.4	15	0.59	1.07
Nitrogen, Ammonia (NH3)	Winter	mg/l	Monitor		13	0.17	11.9	0.02-26.8	8	2.64	3.61
Nitrogen, Ammonia (NH3)	Summer	kg/day	0.18	0.27	12	0.00428	0.01	0.00114-0.0103		
Nitrogen, Ammonia (NH3)	Winter	kg/day	--	--	13	0.00515	0.257	0.000454-0.507		
Fluoride, Total (F)	Annual	mg/l	--	--	7	0.6	0.762	0.49-0.78	20	0.86	1.05
Fluoride, Total (F)	Annual	kg/day	--	--	7	0.0182	0.0498	0.0125-0.0572		
Copper, Total Recoverable	Annual	µg/l	--	50	66	20	56.8	0-84	75	44.7	65.6
Copper, Total Recoverable	Annual	kg/day	--	0.0045	66	0.000568	0.00172	0-0.00413		
Odor, Severity	Annual	Units	Observation		1184	0	0	0-0		
Turbidity, Severity	Annual	Units	Observation		1184	0	0	0-0		
Fecal Coliform	Annual	#/100 ml	**	**	25	1	1	1-12		
Flow Rate	Annual	MGD	Monitor		1284	0.006	0.014	0.001-0.027		
CBOD 5 day	Summer	mg/l	10	15	12	3.2	7.17	1-7.5		
CBOD 5 day	Winter	mg/l	10	15	16	3.4	12.2	1-13.1		
CBOD 5 day	Summer	kg/day	0.91	1.36	12	0.0823	0.311	0.0204-0.312		
CBOD 5 day	Winter	kg/day	0.91	1.36	15	0.092	0.258	0.0303-0.281		

Outfall 006

pH	Annual	S.U.	6.5 to 9.0		272	6.9	7.7	6.5-8.2			
Total Suspended Solids	Annual	mg/l	30	100	281	23	33	6-60			
Total Suspended Solids	Annual	kg/day	1328	4428	277	784	1510	166-3190			
Oil and Grease, Total	Annual	mg/l	15	20	65	0	1	0-3			
Oil and Grease, Total	Annual	kg/day	664	885	65	0	31.8	0-95.6			
Nitrogen, Total	Annual	mg/l	Monitor		56	7.58	13.4	1.51-27.2			
Nitrogen, Total	Annual	kg/day	--	--	56	289	601	77.2-1070			
Nitrogen, Ammonia (NH3)	Summer	mg/l	--	--	13	1.26	4.85	0.34-5.6	26	5.79	7.93
Nitrogen, Ammonia (NH3)	Winter	mg/l	--	--	18	1.43	2.97	0.54-5.6	22	2.74	3.76
Nitrogen, Ammonia (NH3)	Summer	kg/day	--	--	13	56.3	220	15.6-226			
Nitrogen, Ammonia (NH3)	Winter	kg/day	--	--	18	35.3	106	18.3-174			
Fluoride, Total (F)	Annual	mg/l	--	--	7	0.47	0.55	0.39-0.58	20	1.05	1.55
Fluoride, Total (F)	Annual	kg/day	--	--	7	15.6	24.8	12-27.5			
Selenium, Total Recoverable	Annual	µg/l	--	--	7	3	3.86	2-4.1	19	4.1	5.5
Selenium, Total Recoverable	Annual	kg/day	--	--	7	0.115	0.14	0.0693-0.142			
Boron, Total	Annual	µg/l	--	--	7	340	350	240-350	20	839	1304
Boron, Total	Annual	kg/day	--	--	7	10.1	15.6	8.48-16.6			
Cadmium, Total Recoverable	Annual	µg/l	--	--	7	0	0	0-0	20	0.82	1.12
Cadmium, Total Recoverable	Annual	kg/day	--	--	7	0	0	0-0			
Copper, Total Recoverable	Annual	µg/l	--	50	63	22	37	11.8-53.6	72	31.6	40.6
Copper, Total Recoverable	Annual	kg/day	--	2.214	63	0.798	1.39	0.482-2.74			
Flow Rate	Annual	MGD	Monitor		1273	9.41	13.5	4.08-22.9			
Mercury, Total (Low Level)	Annual	ng/l	Monitor		20	11.2	27.3	1.3-60.8	19	37.0	64.9
Mercury, Total (Low Level)	Annual	kg/day	--	--	20	0.000417	0.00113	0.0000387-0.00331			
Acute Toxicity, Ceriodaphnia dubia	Annual	TUa	Monitor		18	0	0	0-0			
Acute Toxicity, Pimephales promelas	Annual	TUa	Monitor		18	0	0.03	0-0.2			

Outfall 007

pH	Annual	S.U.	6.5 to 9.0		271	7.2	8.35	6.5-8.9			
Total Suspended Solids	Annual	mg/l	35	70	72	21	31.4	0-42			
Total Suspended Solids	Annual	kg/day	71	142	69	8.37	33.5	0-66.7			
Fluoride, Total (F)	Annual	mg/l	--	--	32	0.355	0.646	0-1.1	84	0.72	0.99
Fluoride, Total (F)	Annual	kg/day	--	--	31	0.155	0.448	0-1.2			
Boron, Total	Annual	µg/l	Monitor		270	4380	8140	830-9910	307	6234	8540
Boron, Total	Annual	kg/day	--	--	268	2.29	6.26	0.109-2390			
Strontium, Total (Sr)	Annual	µg/l	--	--	31	7380	10500	4080-14100	88	9658	13230
Strontium, Total (Sr)	Annual	kg/day	--	--	31	3.34	9.6	1.49-10.5			
Flow Rate	Annual	MGD	Monitor		270	0.125	0.56	0.012-134			
Mercury, Total (Low Level)	Annual	ng/l	Monitor		26	34.3	72.6	9.2-120	25	78.7	126.1
Mercury, Total (Low Level)	Annual	kg/day	--	--	20	2.05E-05	5.59E-05	0.00000369-0.0000712			

Outfall 008

Water Temperature	Annual	C	--	--	2	17	22.4	11-23			
pH	Annual	S.U.	6.5 to 9.0		274	7.2	8.7	6.5-8.9			
Total Suspended Solids	Annual	mg/l	35	70	72	15	27	0-33			
Total Suspended Solids	Annual	kg/day	52.1	104.1	70	8.34	37.5	0-42.1			
Fluoride, Total (F)	Annual	mg/l	--	--	8	0.32	0.57	0-0.58	21	1.09	1.69
Fluoride, Total (F)	Annual	kg/day	--	--	7	0.161	0.915	0-0.999			
Selenium, Total Recoverable	Annual	µg/l	--	--	8	20.2	31.7	10.4-34.3	25	48.9	72.0
Selenium, Total Recoverable	Annual	kg/day	--	--	7	0.0179	0.0338	0.00838-0.0353			
Boron, Total	Annual	µg/l	--	--	8	3500	3980	2150-4100	21	4533	5810
Boron, Total	Annual	kg/day	--	--	7	3.62	6	1.28-6.32			
Flow Rate	Annual	MGD	Monitor		271	0.165	0.5	0.01-0.98			

Mercury, Total (Low Level)	Annual	ng/l	12	1700	27	61.5	150	19.9-151	26	130.9	210.8
Mercury, Total (Low Level)	Annual	kg/day	0.000018	0.003	24	3.21E-05	0.000104	0.0000121-0.000232			
Acute Toxicity, Ceriodaphnia dubia	Annual	TUa	Monitor		18	0.8	3.52	0-4.18			
Acute Toxicity, Pimephales promelas	Annual	TUa	Monitor		18	0	1.27	0-2.8			
Mercury, Total Recoverable	Annual	µg/l	--	--	7	0.0179	0.0344	0.0024-0.0354			
Mercury, Total Recoverable	Annual	kg/day	--	--	4	1.99E-05	3.25E-05	0.00000431-0.0000329			

Outfall 009

Water Temperature	Annual	C	--	--	2	17	22.4	11-23			
pH	Annual	S.U.	6.5 to 9.0		276	7.4	8.6	6.6-9			
Total Suspended Solids	Annual	mg/l	35	70	79	24	35.2	0-52			
Total Suspended Solids	Annual	kg/day	52.1	104.1	78	8.2	42.9	0-63.6			
Fluoride, Total (F)	Annual	mg/l	--	--	55	0.25	0.5	0-0.605	52	0.43	0.60
Fluoride, Total (F)	Annual	kg/day	--	--	54	0.0303	0.303	0-0.504			
Boron, Total	Annual	µg/l	Monitor		68	5010	7120	1880-8150	81	6412	8784
Boron, Total	Annual	kg/day	--	--	65	1.85	6.19	0.128-9.64			
Flow Rate	Annual	MGD	Monitor		281	0.103	0.49	0.003-0.793			

Table 10. Summary of effluent acute toxicity test results**.**

Test Date(a)	*Ceriodaphnia dubia 48 hours*						*Fathead Minnows 96 hour*					
	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]
Outfall 001												
03/11/08 (E)	NR	NR	30	>50	3.3	NT	NR	NR	>100	35	<1.0	NT
06/17/09 (E)	NR	NR	43	>50	2.3	NT	NR	NR	>100	<10	<1.0	NT
09/09/08 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
11/14/08 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
01/13/09 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	10	<1.0	NT
03/10/09 (E)	NR	NR	>100	15	<1.0	NT	NR	NR	>100	<10	<1.0	NT
05/12/09 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	10	<1.0	NT
07/14/09 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
09/08/09 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
11/03/09 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
01/05/10 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT

[a] O = EPA test; E = entity test
[b] UP = upstream control water
[c] C = laboratory water control
[d] LC_{50} = median lethal concentration
[e] %M = percent mortality in 100% effluent
[f] TUa = acute toxicity units
[g] NF = near field sample in the receiving water
NR = not reported in Ohio EPA database
NT = not tested

Table 10. Summary of effluent acute toxicity test results - continued**.**

Test Date(a)	*Ceriodaphnia dubia 48 hours*						*Fathead Minnows 96 hour*					
	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]
03/09/10 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
05/18/10 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
07/20/10 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
09/20/10 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
11/16/10 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
01/18/11 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
09/13/11 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
09/18/12 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
Outfall 006												
08/12/08 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	10	<1.0	NT
12/09/08 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
03/17/09 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT

[a] O = EPA test; E = entity test
[b] UP = upstream control water
[c] C = laboratory water control
[d] LC_{50} = median lethal concentration
[e] %M = percent mortality in 100% effluent
[f] TUa = acute toxicity units
[g] NF = near field sample in the receiving water
NR = not reported in Ohio EPA database
NT = not tested

Table 10. Summary of effluent acute toxicity test results - continued**.**

Test Date(a)	*Ceriodaphnia dubia 48 hours*						*Fathead Minnows 96 hour*					
	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]
06/16/09 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
08/11/09 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
12/08/09 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
03/16/10 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
06/15/10 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
08/03/10 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
12/14/10 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
03/15/11 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
06/14/11 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
08/16/11 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
12/06/11 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
03/13/12 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT

[a] O = EPA test; E = entity test
[b] UP = upstream control water
[c] C = laboratory water control
[d] LC_{50} = median lethal concentration
[e] %M = percent mortality in 100% effluent
[f] TUa = acute toxicity units
[g] NF = near field sample in the receiving water
NR = not reported in Ohio EPA database
NT = not tested

Table 10. Summary of effluent acute toxicity test results - continued**.**

Test Date(a)	*Ceriodaphnia dubia 48 hours*						*Fathead Minnows 96 hour*					
	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]
06/26/12 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
08/22/12 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
12/18/12 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
Outfall 008												
08/12/08 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
12/09/08 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
03/10/09 (E)	NR	NR	100	50	1.0	NT	NR	NR	>100	<10	<1.0	NT
06/16/09 (E)	NR	NR	>100	10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
08/18/09 (E)	NR	NR	29	>50	3.4	NT	NR	NR	36	>50	2.8	NT
12/08/09 (E)	NR	NR	>100	30	<1.0	NT	NR	NR	>100	<10	<1.0	NT
03/09/10 (E)	NR	NR	23.9	>50	4.18	NT	NR	NR	>100	<10	<1.0	NT
06/15/10 (E)	NR	NR	68.5	>50	1.46	NT	NR	NR	>100	<10	<1.0	NT

[a] O = EPA test; E = entity test
[b] UP = upstream control water
[c] C = laboratory water control
[d] LC_{50} = median lethal concentration
[e] %M = percent mortality in 100% effluent
[f] TUa = acute toxicity units
[g] NF = near field sample in the receiving water
NR = not reported in Ohio EPA database
NT = not tested

Table 10. Summary of effluent acute toxicity test results - continued**.**

Test Date(a)	*Ceriodaphnia dubia 48 hours*						*Fathead Minnows 96 hour*					
	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]
08/03/10 (E)	NR	NR	>100	15	<1.0	NT	NR	NR	>100	<10	<1.0	NT
12/14/10 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
03/15/11 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
06/07/11 (E)	NR	NR	70.9	>50	1.41	NT	NR	NR	100	50	1.0	NT
08/09/11 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	<10	<1.0	NT
12/06/11 (E)	NR	NR	94.3	>50	1.06	NT	NR	NR	>100	<10	<1.0	NT
03/13/12 (E)	NR	NR	71	>50	1.4	NT	NR	NR	>100	<10	<1.0	NT
06/26/12 (E)	NT	NT	NT	NT	NT	NT	NR	NR	>100	<10	<1.0	NT
08/22/12 (E)	NR	NR	51.8	>50	1.93	NT	NR	NR	>100	<10	<1.0	NT
11/27/12 (E)	NR	NR	78.1	>50	1.28	NT	NT	NT	NT	NT	NT	NT
11/27/12 (O)	5	0	29.8	60-100	3.36	70	0	0	61.6	100	1.62	80
12/19/12 (E)	NR	NR	>100	<10	<1.0	NT	NR	NR	>100	35	<1.0	NT

[a] O = EPA test; E = entity test
[b] UP = upstream control water
[c] C = laboratory water control
[d] LC_{50} = median lethal concentration
[e] %M = percent mortality in 100% effluent
[f] TUa = acute toxicity units
[g] NF = near field sample in the receiving water (1:1 manual mixing zone for Ohio EPA tests)
NT = not tested
NR = not reported in Ohio EPA database

Table 11. Effluent Data for AEP-Gavin

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Outfall 001					
Self-Monitoring (DMR) Data					
Fluoride [A]	µg/l	20	20	548.6	676.9
Cobalt [A]	µg/l	72	65	39.42	54.0
Boron [A]	µg/l	20	20	1689.	2035.
Nickel [A]	µg/l	59	55	52.71	72.2
Copper [A]	µg/l	25	10	5.22	7.15
Mercury	ng/l	28	15	2.102	2.88
2. C. Application Data					
Total Dissolved Solids	mg/l	5	5	1276.	1748.
Chloride	mg/l	5	1	12.42	17.02
Sulfates	mg/l	6	6	683.7	936.6
Ammonia	mg/l	6	1	0.107	0.147
NO_3+NO_2	mg/l	6	4	0.23	0.315
Phosphorus	mg/l	6	1	0.092	0.126
Chlorine, tot. res.	µg/l	6	1	181.0	248.0
Aluminum	µg/l	6	6	4706.	6447.
Antimony	µg/l	1	1	0.226	0.31
Arsenic	µg/l	6	1	3.066	4.20
Barium	µg/l	6	6	56.72	77.70
Beryllium	µg/l	1	1	0.407	0.558
Cadmium	µg/l	6	6	0.705	0.966
Chromium, tot.	µg/l	6	1	1.81	2.48
Iron	µg/l	6	6	1119.	1533.
Lead	µg/l	6	1	0.769	1.054
Magnesium	mg/l	6	6	49.06	67.20
Manganese	µg/l	6	6	6393.	8757.
Molybdenum	µg/l	1	1	139.2	186.6
Potassium	mg/l	5	5	8.395	11.50
Strontium	µg/l	5	5	1296.	1776.
Thallium	µg/l	1	1	1.765	2.418
Titanium	µg/l	1	1	4.979	6.82
Zinc	µg/l	6	6	240.7	329.7

[A] Combined DMR data with 2.C. Application Data

Table 11. Effluent Data for AEP-Gavin (Continued)

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Outfall 002					
Self-Monitoring (DMR) Data					
Ammonia – S	mg/l	15	15	0.592	1.072
Ammonia – W	mg/l	8	8	2.635	3.61
Fluoride [A]	µg/l	20	20	858.0	1.049
Copper [A]	µg/l	75	74	44.69	65.63
2. C. Application Data					
Sulfates	mg/l	1	1	452.6	620.0
NO_3+NO_2	mg/l	1	1	438.6	600.8
Phosphorus	mg/l	1	1	25.07	34.35
Chlorine, tot. res.	µg/l	1	1	543.1	744.0
Aluminum	µg/l	1	1	63.36	86.8
Antimony	µg/l	1	1	1.765	2.418
Arsenic	µg/l	1	1	12.36	16.93
Barium	µg/l	1	1	58.84	80.60
Boron	µg/l	1	1	1797.	2461.
Cadmium	µg/l	1	1	0.317	0.434
Iron	µg/l	1	1	108.6	148.8
Lead	µg/l	1	1	0.285	0.391
Magnesium	mg/l	1	1	62.46	85.56
Manganese	µg/l	1	1	28.06	38.44
Nickel	µg/l	1	1	23.99	32.86
Selenium	µg/l	1	1	5.431	7.44
Thallium	µg/l	1	1	0.272	0.372
Zinc	µg/l	1	1	61.10	83.70
Bis(2-ethylhexyl)phthalate	µg/l	1	1	225.8	309.4

[A] Combined DMR data with 2.C. Application Data

Table 11. Effluent Data for AEP-Gavin (Continued)

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Outfall 006					
Self-Monitoring (DMR) Data					
Ammonia – S	mg/l	26	26	5.789	7.93
Ammonia – W	mg/l	22	22	2.743	3.757
Fluoride [A]	µg/l	20	20	1052.	1545.
Selenium [A]	µg/l	19	19	4.129	5.501
Boron [A]	µg/l	20	20	839.2	1304.
Cadmium [A]	µg/l	20	1	0.815	1.116
Copper [A]	µg/l	72	71	31.57	40.62
Mercury	ng/l	19	19	36.98	64.92
2. C. Application Data					
Sulfates	mg/l	1	1	1887.	2585.
NO_3+NO_2	mg/l	1	1	28.60	39.18
Phosphorus	mg/l	1	1	0.769	1.054
Chlorine, tot. res.	µg/l	1	1	3078.	4216.
Aluminum	µg/l	1	1	4336.	5940.
Antimony	µg/l	1	1	1.991	2.728
Arsenic	µg/l	1	1	24.21	33.17
Barium	µg/l	1	1	574.8	787.4
Beryllium	µg/l	1	1	0.498	0.682
Chromium, tot.	µg/l	1	1	12.67	17.36
Cobalt	µg/l	1	1	9.052	12.40
Iron	µg/l	1	1	6789.	9300.
Lead	µg/l	1	1	6.563	8.99
Magnesium	mg/l	1	1	140.8	192.8
Manganese	µg/l	1	1	1073.	1469.
Molybdenum	µg/l	1	1	19.91	27.28
Nickel	µg/l	1	1	32.77	44.89
Silver	µg/l	1	1	0.077	0.105
Thallium	µg/l	1	1	2.263	3.10
Zinc	µg/l	1	1	39.38	53.94
Cyanide, tot.	µg/l	1	1	56.58	77.50
Methylene Chloride	µg/l	1	1	5.341	7.316
Bis(2-ethylhexyl)phthalate	µg/l	1	1	265.7	363.9

[A] Combined DMR data with 2.C. Application Data

Table 11. Effluent Data for AEP-Gavin (Continued)

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Outfall 007					
Self-Monitoring (DMR) Data					
Fluoride	µg/l	84	83	722.7	990.
Boron [A]	µg/l	307	307	6234.	8540.
Strontium [A]	µg/l	88	88	9658.	13230.
Mercury	ng/l	25	25	78.74	126.1
2. C. Application Data					
Total Dissolved Solids	mg/l	5	5	18469.	25300.
Chloride	mg/l	5	5	6112.	8372.
Sulfates	mg/l	6	6	2162.	2961.
Ammonia	mg/l	6	6	8.416	11.53
NO_3+NO_2	mg/l	6	5	1.794	2.457
Nitrite	mg/l	5	5	0.564	0.773
Phosphorus	mg/l	6	6	0.754	1.033
Chlorine, tot. res.	µg/l	1	1	724.2	992.0
Aluminum	µg/l	6	3	617.8	846.3
Antimony	µg/l	1	1	3.259	4.464
Arsenic	µg/l	6	6	94.89	130.0
Barium	µg/l	6	6	240.7	329.7
Cadmium	µg/l	6	4	0.491	0.672
Cobalt	µg/l	1	1	8.147	11.16
Copper	µg/l	6	6	13.49	18.48
Iron	µg/l	6	3	519.7	711.9
Lead	µg/l	6	3	4.292	5.88
Magnesium	mg/l	6	6	24.53	33.60
Manganese	µg/l	6	6	3173.	4347.
Molybdenum	µg/l	1	1	92.78	127.1
Nickel	µg/l	6	6	49.21	67.41
Potassium	mg/l	5	5	1014.	1389.
Selenium	µg/l	6	6	141.6	194.0
Thallium	µg/l	1	1	0.679	0.93
Titanium	µg/l	1	1	8.599	11.78
Zinc	µg/l	6	1	19.32	26.46
Methylene Chloride	µg/l	1	1	4.798	6.572
Bis(2-ethylhexyl)phthalate	µg/l	1	1	67.44	92.38

[A] Combined DMR data with 2.C. Application Data

Table 11. Effluent Data for AEP-Gavin (Continued). [A] Combined DMR data with 2.C. Application Data

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Outfall 008					
Self-Monitoring (DMR) Data					
Fluoride [A]	µg/l	21	20	1091.	1691.
Selenium [A]	µg/l	25	25	48.86	71.97
Boron [A]	µg/l	21	21	4533.	5810.
Mercury	ng/l	26	26	130.9	210.8
2. C. Application Data					
Total Dissolved Solids	mg/l	5	5	8336.	11420.
Chloride	mg/l	5	5	2712.	3714.
Sulfates	mg/l	6	6	2223.	3045.
Bromide	mg/l	1	1	71.06	97.34
Ammonia	mg/l	6	6	2.73	3.74
NO_3+NO_2	mg/l	5	5	2.686	3.68
Nitrite	mg/l	4	4	1.885	2.582
Phosphorus	mg/l	5	4	0.734	1.005
Chlorine, tot. res.	µg/l	1	1	271.6	372.0
Sulfide	mg/l	1	1	44.35	60.76
Aluminum	µg/l	5	1	194.6	266.6
Antimony	µg/l	1	1	2.263	3.10
Arsenic	µg/l	5	5	81.2	111.
Barium	µg/l	5	5	278.7	381.8
Beryllium	µg/l	1	1	0.095	0.13
Cadmium	µg/l	5	1	0.336	0.46
Chromium, tot.	µg/l	5	1	3.526	4.83
Cobalt	µg/l	1	1	6.789	9.30
Copper	µg/l	5	5	11.92	16.33
Iron	µg/l	6	4	284.	388.
Lead	µg/l	5	1	0.996	1.364
Magnesium	mg/l	5	5	63.80	87.40
Manganese	µg/l	5	5	315.7	432.4
Molybdenum	µg/l	1	1	221.8	303.8
Nickel	µg/l	6	6	30.4	41.6
Potassium	mg/l	5	5	381.	522.
Strontium	µg/l	5	5	6867.	9407.
Thallium	µg/l	1	1	0.407	0.558
Zinc	µg/l	6	2	42.9	58.8
Cyanide, tot.	µg/l	1	1	26.07	35.71
Bis(2-ethylhexyl)phthalate	µg/l	2	1	188.	419.1

Table 11. Effluent Data for AEP-Gavin (Continued)

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Outfall 009					
Self-Monitoring (DMR) Data					
Fluoride [A]	µg/l	52	27	428.1	602.1
Boron [A]	µg/l	81	81	6412.	8784.
2. C. Application Data					
Total Dissolved Solids	mg/l	5	5	14624.	20033.
Chloride	mg/l	5	5	4248.	5819.
Sulfates	mg/l	6	6	2729.	3738.
Bromide	mg/l	1	1	65.17	89.28
Ammonia	mg/l	6	6	8.064	11.05
NO_3+NO_2	mg/l	6	4	0.583	0.798
Nitrite	mg/l	5	5	2.183	2.99
Phosphorus	mg/l	6	6	0.077	0.105
Chlorine, tot. res.	µg/l	1	1	1358.	1860.
Sulfide	mg/l	1	1	108.2	148.2
Aluminum	µg/l	6	3	436.9	598.5
Antimony	µg/l	1	1	5.658	7.75
Arsenic	µg/l	5	5	52.55	71.99
Barium	µg/l	6	6	184.0	252.0
Cadmium	µg/l	6	1	0.272	0.372
Chromium, tot.	µg/l	6	1	3.679	5.04
Cobalt	µg/l	1	1	8.147	11.16
Copper	µg/l	6	6	16.40	22.47
Iron	µg/l	6	6	441.5	604.8
Lead	µg/l	6	2	4.446	6.09
Magnesium	mg/l	6	6	27.59	37.80
Manganese	µg/l	6	6	1456.	1995.
Molybdenum	µg/l	1	1	41.64	57.04
Nickel	µg/l	6	6	31.12	42.63
Potassium	mg/l	5	5	918.4	1258.
Selenium	µg/l	6	6	107.0	146.6
Strontium	µg/l	5	5	12072.	16537.
Thallium	µg/l	1	1	0.226	0.31
Zinc	µg/l	6	1	15.33	21.0
Bis(2-ethylhexyl)phthalate	µg/l	1	1	184.2	252.3

[A] Combined DMR data with 2.C. Application Data

Table 12. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria: Average: Human Health	Outside Mixing Zone Criteria: Average: Agri-culture	Outside Mixing Zone Criteria: Average: Aquatic Life	Outside Mixing Zone Criteria: Maximum Aquatic Life	Inside Mixing Zone Maximum
Water Quality Criteria for the Ohio River						
Antimony	µg/l	14.	--	190.	900.	1800.
Arsenic	µg/l	50.	100.	150.	340.	680.
Barium	µg/l	--	--	220.	2000.	4000.
Beryllium	µg/l	16.	100.	15.	130.	250.
Bis (2-ethylhexyl) phthalate	µg/l	18.	--	8.4	1100.	2100.
Boron	µg/l	--	--	3900.	33000.	65000.
Cadmium	µg/l	--	50.	2.8	5.5	11.
Chloride	mg/l	250.	--	--	--	--
Chlorine, total res.	µg/l	--	--	11.	19.	38.
Chromium , total	µg/l	--	100.	100.	2100.	4200.
Cobalt	µg/l	--	--	24.	220.	440.
Copper	µg/l	1300.	500.	11.	17.	33.
Cyanide, free	µg/l	700.	--	5.2	22.	44.
Fluoride	µg/l	1000.	2000.	--	--	--
Iron	µg/l	--	5000.	--	--	--
Lead	µg/l	--	100.	8.1	150.	310.
Mercury [B]	ng/l	12.	10000.	910.	1700.	3400.
Nickel	µg/l	610.	200.	61.	550.	1100.
Nitrite	mg/l	1.0	--	--	--	--
NO_3+NO_2	mg/l	10.	100.	--	--	--
Phenolics, tot.	µg/l	5.0	--	--	--	--
Selenium	µg/l	170.	50.	5.0	--	--
Silver	µg/l	50.	--	1.3	2.2	4.4
Strontium	µg/l	--	--	21000.	40000.	81000.
Sulfates	mg/l	250.	--	--	--	--
Thallium	µg/l	1.7	--	17.	79.	160.
Total Dissolved Solids	mg/l	--	--	1500.	--	--
Vanadium	µg/l	--	--	44.	150.	300.
Zinc	µg/l	9100.	25000.	140.	140.	280.

[B] Bioaccumulative Chemical of Concern

Table 12. Water Quality Criteria in the Study Area (Continued)

Parameter	Units	Outside Mixing Zone Criteria: Average: Human Health	Outside Mixing Zone Criteria: Average: Agri-culture	Outside Mixing Zone Criteria: Average: Aquatic Life[A]	Outside Mixing Zone Criteria: Maximum Aquatic Life	Inside Mixing Zone Maximum
Water Quality Criteria for Kyger Creek, Turkey Run and the unnamed tributary of Turkey Run						
Ammonia - S	mg/l	--	--	1.8	13.	--
Ammonia - W	mg/l	--	--	5.6	13.	--
Antimony	µg/l	4300.	--	190.	900.	1800.
Arsenic	µg/l	--	100.	150.	340.	680.
Barium	µg/l	--	--	220.	2000.	4000.
Beryllium	µg/l	280.	100.	100.	870.	1700.
Bis(2-ethylhexyl)phthalate	µg/l	59.	--	8.4	1100.	2100.
Boron	µg/l	--	--	3900.	33000.	65000.
Cadmium	µg/l	--	50.	7.3	22.	43.
Chlorine, tot. res.	µg/l	--	--	11.	19.	38.
Chromium , total	µg/l	--	100.	270.	5600.	11000.
Cobalt	µg/l	--	--	24.	220.	440.
Copper	µg/l	1300.	500.	30.	52.	100.
Cyanide, free	µg/l	220000.	--	12.	46.	92.
Fluoride	µg/l	--	2000.	--	--	--
Iron	µg/l	--	5000.	--	--	--
Lead	µg/l	--	100.	37.	710.	1400.
Mercury [B]	ng/l	12.	10000.	910.	1700.	3400.
Nickel	µg/l	4600.	200.	170.	1500.	3000.
NO_3+NO_2	mg/l	--	100.	--	--	--
Selenium	µg/l	11000.	50.	5.0	--	--
Silver	µg/l	--	--	1.3	17.	35.
Strontium	µg/l	--	--	21000.	40000.	81000.
Thallium	µg/l	6.3	--	17.	79.	160.
Vanadium	µg/l	--	--	44.	150.	300.
Zinc	µg/l	69000.	25000.	390.	390.	780.

[A] These criteria apply only to the unnamed tributary of Turkey Run
[B] Bioaccumulative Chemical of Concern

Table 12. Water Quality Criteria in the Study Area (Continued)

Parameter	Units	Outside Mixing Zone Criteria: Average: Human Health	Average: Agri-culture	Average: Aquatic Life	Maximum Aquatic Life	Inside Mixing Zone Maximum
Water Quality Criteria for Stingy Run						
Ammonia - S	mg/l	--	--	--	13.	--
Ammonia - W	mg/l	--	--	--	13.	--
Antimony	µg/l	4300.	--	--	900.	1800.
Arsenic	µg/l	--	100.	--	340.	680.
Barium	µg/l	--	--	--	2000.	4000.
Beryllium	µg/l	280.	100.	--	740.	1500.
Bis(2-ethylhexyl)phthalate	µg/l	59.	--	--	1100.	2100.
Boron	µg/l	--	--	--	33000.	65000.
Cadmium	µg/l	--	50.	--	19.	38.
Chlorine, tot. res.	µg/l	--	--	--	19.	38.
Chromium , total	µg/l	--	100.	--	5200.	10000.
Cobalt	µg/l	--	--	--	220.	440.
Copper	µg/l	1300.	500.	--	47.	94.
Cyanide, free	µg/l	220000.	--	--	46.	92.
Fluoride	µg/l	--	2000.	--	--	--
Iron	µg/l	--	5000.	--	--	--
Lead	µg/l	--	100.	--	630.	1300.
Mercury [B]	µg/l	12.	10000.	--	1700.	3400.
Nickel	µg/l	4600.	200.	--	1400.	2800.
NO_3+NO_2	mg/l	--	100.	--	--	--
Selenium	µg/l	11000.	50.	--	--	--
Silver	µg/l	--	--	--	15.	29.
Strontium	µg/l	--	--	--	40000.	81000.
Thallium	µg/l	6.3	--	--	79.	160.
Vanadium	µg/l	--	--	--	150.	300.
Zinc	µg/l	69000.	25000.	--	360.	710.

[B] Bioaccumulative Chemical of Concern

Table 13. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Ohio River				
7Q10	cfs	annual	6700.	ORSANCO
Harmonic Mean Flow	cfs	annual	26000.	ORSANCO
Instream Hardness	mg/l	annual	120.	STORET
Mixing Assumption	%	average	10.	Stream-to-discharge ratio
	%	maximum	1.0	Stream-to-discharge ratio

Background Water Quality for the Ohio River (µg/l)

Antimony	0.16	ORSANCO; 50 values, 2000-2008
Arsenic	0.90	ORSANCO; 50 values, 2000-2008
Barium	42.6	ORSANCO; 50 values, 2000-2008
Bis (2-ethylhexyl) phthalate	0.	No representative data available.
Boron	0.	No representative data available.
Cadmium	0.05	ORSANCO; 50 values, 2000-2008
Chloride (mg/l)	22.	BWQR; 2879 values, 0 <MDL
Chlorine, tot. res.	0.	No representative data available.
Chromium, total	1.14	ORSANCO; 50 values, 2000-2008
Cobalt	0.	No representative data available.
Copper	2.3	ORSANCO; 50 values, 2000-2008
Cyanide, free	0.	No representative data available.
Fluoride	0.	No representative data available.
Iron	406.	ORSANCO; 50 values, 2000-2008
Lead	0.48	ORSANCO; 50 values, 2000-2008
Mercury (ng/l)	0.	No representative data available.
Nickel	2.96	ORSANCO; 50 values, 2000-2008
Nitrite (mg/l)	0.02	BWQR; 5001 values
NO_3+NO_2 (mg/l)	0.97	ORSANCO; 46 values, 2000-2008
Phenolics, tot.	2.5	ORSANCO; 43 values, 2000-2008
Selenium	0.56	ORSANCO; 50 values, 2000-2008
Silver	0.02	ORSANCO; 50 values, 2000-2008
Strontium	854.	BWQR; 1126 values
Sulfate (mg/l)	74.	ORSANCO; 48 values, 2000-2008
Thallium	0.	No representative data available.
Total Dissolved Solids (mg/l)	382.	BWQR; 3755 values, 0 <MDL
Vanadium	0.	No representative data available.
Zinc	4.78	ORSANCO; 50 values, 2000-2008

BWQR – Background Water Quality Report
ORSANCO – Ohio River Sanitation Commission

Table 13. Instream Conditions and Discharger Flow (Continued)

Parameter	Units	Season	Value	Basis
Kyger Creek Upst Stingy Run				
7Q10	cfs	annual	0.14.	USGS gage #03202000, 1938-97 data
1Q10	cfs	annual	0.11	USGS gage #03202000, 1938-97 data
Harmonic Mean Flow	cfs	annual	1.89	USGS gage #03202000, 1938-97 data
Stingy Run Upst Gavin 001				
7Q10	cfs	annual	0.02	USGS gage #03202000, 1938-97 data
1Q10	cfs	annual	0.01	USGS gage #03202000, 1938-97 data
30Q10	cfs	summer	0.02	USGS gage #03202000, 1938-97 data
30Q10	cfs	winter	0.22	USGS gage #03202000, 1938-97 data
Harmonic Mean Flow	cfs	annual	0.21	USGS gage #03202000, 1938-97 data
Turkey Run Upst Gavin 010				
7Q10	cfs	annual	0.01	USGS gage #03202000, 1938-97 data
1Q10	cfs	annual	0.01	USGS gage #03202000, 1938-97 data
30Q10	cfs	summer	0.02	USGS gage #03202000, 1938-97 data
30Q10	cfs	winter	0.16	USGS gage #03202000, 1938-97 data
Harmonic Mean Flow	cfs	annual	0.16	USGS gage #03202000, 1938-97 data
Little Kyger Creek				
7Q10	cfs	annual	0.04.	USGS gage #03202000, 1938-97 data
1Q10	cfs	annual	0.03	USGS gage #03202000, 1938-97 data
Harmonic Mean Flow	cfs	annual	0.54	USGS gage #03202000, 1938-97 data
Kyger Creek and Turkey Run				
Mixing Assumption	%	average	100	Stream-to-discharge ratio
	%	maximum	100	Stream-to-discharge ratio
Instream Hardness	mg/l	annual	400.	STORET; 22 values, 2008
Instream Temperature	°C	summer	23	BWQR – SE Ohio River Tributaries
	°C	winter	7	BWQR – SW Ohio River Tributaries
Instream pH	S.U.	summer	7.7	BWQR – SE Ohio River Tributaries
	S.U.	winter	7.7	same as summer – insufficient winter data

Table 13. Instream Conditions and Discharger Flow (Continued)

Parameter	Units	Season	Value	Basis

Stingy Run

Mixing Assumption	%	average	100	Stream-to-discharge ratio
	%	maximum	100	Stream-to-discharge ratio
Instream Hardness	mg/l	annual	361.	STORET; 5 values, 2008

Background Water Quality for Kyger Creek and Stingy Run (µg/l)

Ammonia – S&W (mg/l)	0.05	STORET; 6 values, 4<MDL, 2008
Antimony	0.16	ORSANCO; 50 values, 2000-2008 (Ohio R)
Arsenic	0.	STORET; 5 values, 5<MDL, 2008
Barium	57.6	STORET; 5 values, 0<MDL, 2008
Bis (2-ethylhexyl) phthalate	0.	No representative data available.
Boron	0.	No representative data available.
Cadmium	0.12	STORET; 5 values, 4<MDL, 2008
Chlorine, tot. res.	0.	No representative data available.
Chromium, total	0.	STORET; 5 values, 5<MDL, 2008
Cobalt	0.	No representative data available.
Copper	1.2	STORET; 5 values, 4<MDL, 2008
Cyanide, free	0.	No representative data available.
Fluoride	0.	No representative data available.
Iron	621.	STORET; 5 values, 0<MDL, 2008
Lead	0.	STORET; 5 values, 5<MDL, 2008
Mercury	0.	No representative data available.
Nickel	21.4	STORET; 5 values, 0<MDL, 2008
NO_3+NO_2 (mg/l)	0.13	STORET; 5 values, 0<MDL, 2008
Selenium	0.	STORET; 5 values, 5<MDL, 2008
Silver	0.02	ORSANCO; 50 values, 2000-2008 (Ohio R)
Strontium	321.	STORET; 5 values, 0<MDL, 2008
Thallium	0.	No representative data available.
Total Dissolved Solids (mg/l)	460.	STORET; 5 values, 0<MDL, 2008
Vanadium	0.	No representative data available.
Zinc	22.	STORET; 5 values, 2<MDL, 2008

Table 13. Instream Conditions and Discharger Flow (Continued)

Parameter	Units	Season	Value	Basis

Background Water Quality for Turkey Run (µg/l)

Ammonia – S&W (mg/l)	0.18	STORET; 6 values, 0<MDL, 2008
Antimony	0.16	ORSANCO; 50 values, 2000-2008 (Ohio R)
Arsenic	0.	STORET; 5 values, 5<MDL, 2008
Barium	37.4	STORET; 5 values, 0<MDL, 2008
Bis (2-ethylhexyl) phthalate	0.	No representative data available.
Boron	0.	No representative data available.
Cadmium	0.46	STORET; 5 values, 0<MDL, 2008
Chlorine, tot. res.	0.	No representative data available.
Chromium, total	0.	STORET; 5 values, 5<MDL, 2008
Cobalt	0.	No representative data available.
Copper	3.5	STORET; 5 values, 0<MDL, 2008
Cyanide, free	0.	No representative data available.
Fluoride	0.	No representative data available.
Iron	911.	STORET; 5 values, 0<MDL, 2008
Lead	0.	STORET; 5 values, 5<MDL, 2008
Mercury	0.	No representative data available.
Nickel	113.	STORET; 5 values, 0<MDL, 2008
NO_3+NO_2 (mg/l)	0.15	STORET; 5 values, 1<MDL, 2008
Selenium	0.	STORET; 5 values, 5<MDL, 2008
Silver	0.02	ORSANCO; 50 values, 2000-2008 (Ohio R)
Strontium	336.	STORET; 5 values, 0<MDL, 2008
Thallium	0.	No representative data available.
Total Dissolved Solids (mg/l)	700.	STORET; 5 values, 0<MDL, 2008
Vanadium	0.	No representative data available.
Zinc	213.	STORET; 5 values, 0<MDL, 2008

Discharge flows for Ohio Power- Gavin and Ohio Valley Electric Corporation

Gavin 001	cfs	annual	4.66	DMRs – 95th percentile of monthly avgs.
Gavin 002	cfs	annual	0.02	DMRs – 95th percentile of monthly avgs.
Gavin 006	cfs	annual	18.57	DMRs – 95th percentile of monthly avgs.
Gavin 007	cfs	annual	0.537	DMRs – 95th percentile of monthly avgs.
Gavin 008	cfs	annual	0.456	DMRs – 95th percentile of monthly avgs.
Gavin 009	cfs	annual	0.628	DMRs – 95th percentile of monthly avgs.
Gavin 010	cfs	annual	0.603	DMRs – 95th percentile of monthly avgs.
Gavin 011	cfs	annual	0.603	DMRs – 95th percentile of monthly avgs.
OVEC 001	cfs	annual	6.70	DSW
OVEC 003	cfs	annual	1823.	DSW
OVEC 005	cfs	annual	25.27	DSW

Table 14. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average		Maximum		Inside
		Human Health	Agri Supply	Aquatic Life	Aquatic Life	Mixing Zone Maximum
Outfall 001						
Barium	µg/l	--	--	2290. [B]	2004.	4000.
Boron	µg/l	--	--	72600. [A B]	33060.	65000.
Cadmium	µg/l	--	52. [A]	84. [A B]	19.	38.
Chlorine, tot. res.	µg/l	--	--	322. [A B]	19.	38.
Cobalt	µg/l	--	--	686. [A B]	220.	440.
Copper	µg/l	1352. [A]	520. [A]	127. [A B]	38.	94.
Fluoride	µg/l	46800. [B]	2079.	--	--	--
Nickel	µg/l	4782. [A]	207.	1648. [B]	1403.	2800.
Sulfate	mg/l	8306. [B]	--	--	--	--
Thallium	µg/l	6.6	--	520. [A B]	79.	160.
Total Dissolved Solids	mg/l	--	--	25680. [B]	--	--
Zinc	µg/l	72110. [A]	26130. [A]	3203. [A B]	361.	710.

[A] Allocation must not exceed the Inside Mixing Zone Maximum.
[B] Allocation to meet criteria in the Ohio River

Table 14. Continued - Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average Human Health	Average Agri Supply	Maximum Aquatic Life	Maximum Aquatic Life	Inside Mixing Zone Maximum
Outfall 002						
Barium	µg/l	--	--	2290.	7186.[A]	4000.
Bis(2-ethylhexyl)phthalate	µg/l	2535.[A]	--	302.	5064.[A]	2100.
Boron	µg/l	--	--	72600.[A]	449600.[A]	65000.
Chlorine, tot. res.	µg/l	--	--	322.[A]	87.[A]	38.
Copper	µg/l	182800.[A]	70110.[A]	127.[A]	38.[A]	33.
Fluoride	µg/l	46800.	207600.	--	--	--
Nickel	µg/l	84590.[A]	27760.[A]	1648.[A]	2522.[A]	1100.
NO_3+NO_2	mg/l	543.	13950.	--	--	--
Sulfate	mg/l	8306.	--	--	--	--
Selenium	µg/l	9782.	6965.	71.	--	--
Zinc	µg/l	941300.[A]	2595000[A]	3203.[A]	498.[A]	280.

[A] Allocation must not exceed the Inside Mixing Zone Maximum.

Table 14. Continued - Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average Human Health	Average Agri Supply	Maximum Aquatic Life	Maximum Aquatic Life	Inside Mixing Zone Maximum
Outfall 006						
Arsenic	µg/l	2836.[A]	13980.[A]	2356.[A]	1564.[A]	680.
Barium	µg/l	--	--	2290.	7186.[A]	4000.
Bis(2-ethylhexyl)phthalate	µg/l	2535.[A]	--	302.	5064.[A]	2100.
Cadmium	µg/l	--	7044.[A]	84.[A]	25.[A]	11.
Chlorine, tot. res.	µg/l	--	--	322.[A]	87.[A]	38.
Cobalt	µg/l	--	--	686.[A]	1014.[A]	440.
Copper	µg/l	182800.[A]	70110.[A]	127.[A]	38.[A]	33.
Cyanide, free	µg/l	97880.[A]	--	193. [A]	101.[A]	44.
Fluoride	µg/l	46800.	207600.	--	--	--
Iron	µg/l	--	477700.	--	--	--
Lead	µg/l	--	14030.[A]	273.	690.[A]	310.
Mercury	ng/l	12.	10000.[A]	910.	1700.	3400.
Nickel	µg/l	84590.[A]	27760.[A]	1648.[A]	2522.[A]	1100.
NO_3+NO_2	mg/l	543.	13950.	--	--	--
Sulfate	mg/l	8306.	--	--	--	--
Selenium	µg/l	9782.	6965.	71.	--	--
Thallium	µg/l	240.[A]	--	520.[A]	364.[A]	160.
Zinc	µg/l	941300.[A]	2595000 [A]	3203. [A]	498.[A]	280.

[A] Allocation must not exceed the Inside Mixing Zone Maximum.

Table 14. Continued - Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average Human Health	Average Agri Supply	Average Aquatic Life	Maximum Aquatic Life	Inside Mixing Zone Maximum
Outfall 007						
Ammonia – S	mg/l	--	--	--	13.2	--
Ammonia – W	mg/l	--	--	--	14.8	--
Arsenic	µg/l	2836.[A]	114.	2356.[A B]	343.	680.
Barium	µg/l	--	--	2290.[B]	2011.	4000.
Bis(2-ethylhexyl)phthalate	µg/l	143.	--	302.[B]	2356.[A]	2100.
Boron	µg/l	--	--	72600.[A B]	33180.	65000.
Chloride	mg/l	22090.[B]	--	--	--	--
Chlorine, tot. res.	µg/l	--	--	322.[A B]	41.[A]	38.
Cobalt	µg/l	--	--	686.[A B]	222.	440.
Copper	µg/l	1425.[A]	548.[A]	127.[A B]	38.	100.
Fluoride	µg/l	46800.[B]	2243.	--	--	--
Lead	µg/l	--	114.	273.[B]	716.	1400.
Mercury	ng/l	12.	10000.[A]	910.[B]	1700.	3400.
Nickel	µg/l	5230.[A]	212.	1648.[B]	1512.	3000.
Nitrite	mg/l	1608.[B]	--	--	--	--
Selenium	µg/l	9782.	57.	71.[B]	--	--
Sulfate	mg/l	8306.[B]	--	--	--	--
Strontium	µg/l	--	--	213800[A B]	85280.[A]	81000.
Thallium	µg/l	15.	--	520.[A B]	169.[A]	160.
Total Dissolved Solids	mg/l	--	--	25680.[B]	--	--

[A] Allocation must not exceed the Inside Mixing Zone Maximum.

[B] Allocation to meet criteria in the Ohio River

Table 14. Continued - Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average Human Health	Average Agri Supply	Average Aquatic Life	Maximum Aquatic Life	Inside Mixing Zone Maximum
Outfall 008						
Arsenic	µg/l	2836.[A]	127.	2356.[A B]	401.	680.
Barium	µg/l	--	--	2290.[B]	2011.	4000.
Bis(2-ethylhexyl)phthalate	µg/l	427.	--	302.[B]	5951.[A]	2100.
Boron	µg/l	--	--	72600.[A B]	33180.	65000.
Chloride	mg/l	22090.[B]	--	--	--	--
Chlorine, tot. res.	µg/l	--	--	322.[A B]	24.	38.
Cobalt	µg/l	--	--	686.[A B]	273.	440.
Copper	µg/l	1425.[A]	548.[A]	127.[A B]	38.	100.
Cyanide, free	µg/l	97880.[A]	--	445.[A B]	283.[A]	94.
Fluoride	µg/l	46800.[B]	2243.	--	--	--
Mercury	ng/l	12.	10000.[A]	910.[B]	1700.	3400.
Nickel	µg/l	23580.[A]	940.	1648.[B]	3019.[A]	3000.
Nitrite	mg/l	1608.[B]	--	--	--	--
NO_3+NO_2	mg/l	543.[B]	136.	--	--	--
Selenium	µg/l	9782.	64.	71.[B]	--	--
Sulfate	mg/l	8306.[B]	--	--	--	--
Total Dissolved Solids	mg/l	--	--	25680.[B]	--	--

[A] Allocation must not exceed the Inside Mixing Zone Maximum.
[B] Allocation to meet criteria in the Ohio River

Table 14. Continued - Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

		Average	Maximum	Inside

Parameter	Units	Human Health	Agri Supply	Aquatic Life	Aquatic Life	Mixing Zone Maximum
Outfall 009						
Ammonia - S	mg/l	--	--	--	13.4	--
Ammonia - W	mg/l	--	--	--	17.5	--
Antimony	µg/l	1388.	--	5211. [A B]	1101.	1800.
Arsenic	µg/l	2836.[A]	127.	2356. [A B]	401.	680.
Barium	µg/l	--	--	2290. [B]	2004.	4000.
Bis(2-ethylhexyl)phthalate	µg/l	427.	--	302. [B]	5951.[A]	2100.
Boron	µg/l	--	--	72600.[A B]	33060.	65000.
Chloride	mg/l	22090.[B]	--	--	--	--
Chlorine, tot. res.	µg/l	--	--	322. [A B]	19.	38.
Cobalt	µg/l	--	--	686. [A B]	220.	440.
Copper	µg/l	1352.[A]	520.[A]	127. [A B]	38.	94.
Fluoride	µg/l	46800.[B]	2079.	--	--	--
Lead	µg/l	--	870.	273.[B]	5307.[A]	1300.
Nickel	µg/l	4782.[A]	207.	1648. [B]	1403.	2800.
Nitrite	mg/l	1608.[B]	--	--	--	--
Selenium	µg/l	9782.	64.	71. [B]	--	--
Sulfate	mg/l	8306.[B]	--	--	--	--
Strontium	µg/l	--	--	835600[AB]	324300. [A]	81000.
Total Dissolved Solids	mg/l	--	--	25680. [B]	--	--

[A] Allocation must not exceed the Inside Mixing Zone Maximum.
[B] Allocation to meet criteria in the Ohio River

Table 14. Continued - Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average Human Health	Average Agri Supply	Maximum Aquatic Life	Maximum Aquatic Life	Inside Mixing Zone Maximum
Outfalls 010 / 011						
Ammonia – S	mg/l	--	--	1.8	13.2	--
Ammonia – W	mg/l	--	--	5.6	14.8	--
Antimony	µg/l	1388.	--	190.	900.	1800.
Arsenic	µg/l	2836.[A]	114.	150.	340.	680.
Barium	µg/l	--	--	220.	2000.	4000.
Boron	µg/l	--	--	3900.	33000.	65000.
Cadmium	µg/l	--	63.[A]	7.3	22.	43.
Chromium, tot.	µg/l	--	127.	270.	5600.	11000.
Chloride	mg/l	22090.[B]	--	--	--	--
Chlorine, tot. res.	µg/l	--	--	11.	19.	38.
Cobalt	µg/l	--	--	24.	220.	440.
Copper	µg/l	1425.[A]	548.[A]	30.	38.	100.
Lead	µg/l	--	114.	37.	710.	1400.
Nickel	µg/l	5230.[A]	212.	170.	1500.	3000.
Selenium	µg/l	9782.	57.	5.0	--	--
Total Dissolved Solids	mg/l	--	--	1500.	--	--
Zinc	µg/l	87250.[A]	31580.[A]	390.	390.	780.

[A] Allocation must not exceed the Inside Mixing Zone Maximum.
[B] Allocation to meet criteria in the Ohio River

Table 15. Parameter Assessment for **Outfall 001**

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

Aluminum	Magnesium	Manganese
Phosphorus	Potassium	Titanium

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

Ammonia	Antimony	Arsenic
Beryllium	Chloride	Chromium, tot
Iron	Lead	Mercury
Molybdenum	NO_3+NO_2	Strontium

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

Barium	Boron	Cadmium
Cobalt	Copper	Fluoride
Nickel	Sulfates	TDS
Thallium		

Group 4: $PEQ_{max} \geq$ 50% but <100% of the maximum PEL or $PEQ_{avg} \geq$ 50% but < 100% of the average PEL. Monitoring is appropriate.

No parameters meet the criteria of this group.

Group 5: Maximum PEQ ≥ 100% of the maximum PEL or average PEQ ≥ 100% of the average PEL, or either the average or maximum PEQ is between 75 and 100% of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Applicable Period	Recommended Effluent Limits Average	Maximum
Chlorine, tot. res.	µg/lannual	--	19.	
Zinc	µg/lannual	--	361.	

Table 16. Parameter Assessment for **Outfall 002**

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

Aluminum	Magnesium	Manganese
Phosphorus		

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

Antimony	Arsenic	Cadmium
Iron	Lead	Thallium

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

Barium	Boron	Fluoride
Nickel	Selenium	Sulfates
Zinc		

Group 4: $PEQ_{max} \geq$ 50% but <100% of the maximum PEL or $PEQ_{avg} \geq$ 50% but < 100% of the average PEL. Monitoring is appropriate.

Bis(2-ethylhexyl)phthalate	NO_3+NO_2 (>75%)

Group 5: Maximum PEQ ≥ 100% of the maximum PEL or average PEQ ≥ 100% of the average PEL, or either the average or maximum PEQ is between 75 and 100% of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Applicable Period	Recommended Effluent Limits Average	Maximum
Chlorine, tot. res.	µg/l	summer	--	38.
Copper	µg/l	annual	--	33.

Table 17. Continued - Parameter Assessment for **Outfall 006**

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

Aluminum	Cyanide, tot.	Magnesium
Manganese	Phosphorus	

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

Antimony	Beryllium	Boron
Chromium, tot.	Cyanide, free	Methylene Chloride
Molybdenum	Silver	

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

Arsenic	Barium	Cadmium
Cobalt	Fluoride	Iron
Lead	Nickel	NO_3+NO_2
Selenium	Sulfates	Thallium
Zinc		

Group 4: $PEQ_{max} \geq$ 50% but <100% of the maximum PEL or $PEQ_{avg} \geq$ 50% but < 100% of the average PEL. Monitoring is appropriate.

No parameters meet the criteria of this group.

Group 5: Maximum PEQ ≥ 100% of the maximum PEL or average PEQ ≥ 100% of the average PEL, or either the average or maximum PEQ is between 75 and 100% of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Applicable Period	Recommended Effluent Limits Average	Maximum
Bis(2-ethylhexyl)phthalate	µg/l	annual	302.	2100.
Chlorine, tot. res.	µg/l	summer	--	38.
Copper	µg/l	annual	--	33.
Mercury	ng/l	annual	12.	1700.

Table 18. Continued - Parameter Assessment for **Outfall 007**

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

Aluminum	Magnesium	Manganese
Phosphorus	Potassium	Titanium

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

Antimony	Cadmium	Iron
Methylene Chloride	Molybdenum	NO_3+NO_2
Zinc		

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

Barium	Bis(2-ethylhexyl)phthalate	Boron
Chloride	Cobalt	Copper
Fluoride	Lead	Nickel
Nitrite	Sulfates	Strontium
Thallium		

Group 4: $PEQ_{max} \geq$ 50% but <100% of the maximum PEL or $PEQ_{avg} \geq$ 50% but < 100% of the average PEL. Monitoring is appropriate.

TDS

Group 5: Maximum PEQ $\geq$ 100% of the maximum PEL or average PEQ $\geq$ 100% of the average PEL, or either the average or maximum PEQ is between 75 and 100% of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Applicable Period	Recommended Effluent Limits Average	Maximum
Ammonia	mg/l	summer	--	13.2
Ammonia	mg/l	winter	--	14.8
Arsenic	µg/l	annual 114.	343.	
Chlorine, tot. res.	µg/l	summer --	38.	
Mercury	ng/l	annual	12.	1700.
Selenium	µg/l	annual 57.	--	

Table 19. Continued - Parameter Assessment for **Outfall 008**

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

Aluminum	Bromide	Cyanide, tot.
Magnesium	Manganese	Phosphorus
Potassium	Sulfide	

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

Ammonia	Antimony	Beryllium
Cadmium	Chromium tot.	Cyanide, free
Iron	Lead	Molybdenum
Strontium	Thallium	Zinc

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

TDS	Barium	Boron
Chloride	Cobalt	Copper
Fluoride	Nickel	Nitrite
NO_3+NO_2	Sulfates	

Group 4: $PEQ_{max} \geq$ 50% but <100% of the maximum PEL or $PEQ_{avg} \geq$ 50% but < 100% of the average PEL. Monitoring is appropriate.

Selenium (>75%)	Bis(2-ethylhexyl)phthalate	Arsenic

Group 5: Maximum PEQ ≥ 100% of the maximum PEL or average PEQ ≥ 100% of the average PEL, or either the average or maximum PEQ is between 75 and 100% of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Applicable Period	Recommended Effluent Limits Average	Maximum
Chlorine, tot. res.	µg/l	annual	--	24.
Mercury	ng/l	annual	12.	1700.

Table 20. Continued - Parameter Assessment for **Outfall 009**

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

Aluminum	Bromide	Magnesium
Manganese	Phosphorus	Potassium

Sulfide

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

Cadmium	Chromium tot.	Iron
Molybdenum	NO_3+NO_2Thallium	
Zinc		

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

Antimony	Arsenic	Barium
Boron	Chloride	Cobalt
Fluoride	Lead	Nickel
Nitrite	Sulfates	Strontium

Group 4: $PEQ_{max} \geq$ 50% but <100% of the maximum PEL or $PEQ_{avg} \geq$ 50% but < 100% of the average PEL. Monitoring is appropriate.

Bis(2-ethylhexyl)phthalate	Copper	TDS

Group 5: Maximum PEQ ≥ 100% of the maximum PEL or average PEQ ≥ 100% of the average PEL, or either the average or maximum PEQ is between 75 and 100% of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Applicable Period	Recommended Effluent Limits Average	Maximum
Ammonia	mg/l	summer	--	13.4
Ammonia	mg/l	winter	--	17.5
Chlorine, tot. res.	µg/lannual	--	19.	
Selenium	µg/lannual	64.	--	

Table 21. Final effluent limits and monitoring requirements for Ohio Power Gavin outfalls 0IB00006001 and 0IB00006002 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Outfall 001						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	30	100	475	1582	BPT
Oil and Grease	mg/l	15	20	237	316	BPT
pH	S.U.	- - - - - - - - - - - -	6.0 to 9.0	- - - - - - - - - - - - - - -		BPT
Zinc, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Outfall 002						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Dissolved Oxygen	mg/l	--	5.0 min.	--	--	EP/PD
$CBOD_5$	mg/l	10	15	0.91	1.36	EP/PD
Suspended Solids	mg/l	12	18	1.09	1.64	EP/PD
Ammonia-N	mg/l					
Summer		2.0	3.0	0.18	0.27	EP/PD
Winter		- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Nitrate/Nitrite-N	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
pH	S.U.	- - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - - - -		WQS
E. Coli.	#/100ml					
Summer		130	292[d]	--	--	WQS
Fecal coliform	#/100ml					
Winter		1000	2000	--	--	ABS/EP
Turbidity, Severity	units	- - - - - - - - - - - -	Observation	- - - - - - - - - - - - - -		M[c]
Copper, T. R.	µg/l	--	33	--	0.0016	WLA/IMZM
Bis(2-ethylhexyl) phthalate	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]

[a] Effluent loadings based on average discharge flow of 4.18 MGD (Outfall 001); an average discharge flow of 0.024 MGD for CBOD, suspended solids and ammonia at Outfall 002; and an average discharge flow of 0.013 MGD for copper at Outfall 002.

[b] Definitions: BPT = Best Practicable Waste Treatment Technology, 40 CFR Part 423, Steam Electric Power Generating – Fly Ash Transport; EP = Existing Permit; M = Monitoring; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; 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.

Table 22. Final effluent limits and monitoring requirements for Ohio Power Gavin outfalls 0IB00006006 and 0IB00006606 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Outfall 006						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Dissolved Solids	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	30	99	1328	4380	BPT
Nitrogen, Total	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Oil and Grease	mg/l	15	20	664	885	BPT
pH	S.U.	- - - - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - -		WQS
Chlorine Residual	mg/l	--	0.038	--	--	WLA/IMZM
Copper, T. R.	µg/l	--	33	--	1.5	WLA/IMZM
Mercury, T.	ng/l	12	1700	0.00055	0.077	WLA
Bis(2-ethylhexyl) phthalate	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M/RP[c]
Outfall 606						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
pH	S.U.	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Copper, T.	µg/l	1000	1000	--	--	BAT
Iron, T.	µg/l	1000	1000	--	--	BAT

[a] Effluent loadings for Outfall 006 based on an average flow of 11.7 MGD, except copper and mercury, which are based on average discharge flow of 12.0 MGD.

[b] Definitions: BAT = Best Available Control Technology Currently Available, 40 CFR Part 423, Steam Electric Power Generating – Chemical Metal Cleaning; BPT = Best Practicable Waste Treatment Technology, 40 CFR Part 423, Steam Electric Power Generating – Bottom Ash Transport, Low Volume Wastewater, Coal Pile Runoff; M = Monitoring; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; 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.

Table 23. Final effluent limits and monitoring requirements for Ohio Power Gavin outfalls 0IB00006007 and 0IB00006008 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Outfall 007						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Dissolved Solids	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Suspended Solids	mg/l	35	70	71	142	EP/PD
Ammonia-N	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
pH	S.U.	- - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - - - -		WQS
Arsenic, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Mercury, T.	ng/l	12	1700	0.000015	0.0022	WLA
Selenium, T. R.	µg/l	57	--	0.075	--	WLA
Whole Effluent Toxicity						
Acute	TUa	--	1.0	--	--	WET/WLA
Outfall 008						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Dissolved Solids	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	35	70	52.1	104	EP/PD
pH	S.U.	- - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - - - -		WQS
Chloride	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Sulfate	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Arsenic, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Mercury, T.	ng/l	131	1700	0.00019	0.0025	WLA
Selenium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Bis(2-ethylhexyl) phthalate	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Whole Effluent Toxicity						
Acute	TUa	--	1.0	--	--	WET/WLA

[a] For Outfall 007, effluent loadings based on average discharge flow of 0.534 MGD for suspended solids and 0.347 MGD for mercury and selenium. For Outfall 008, effluent loadings based on average discharge flow of 0.393 MGD for suspended solids and 0.295 MGD for mercury.

[b] Definitions: EP = Existing Permit; M = Monitoring; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ; WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; 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.

Table 24. Final effluent limits and monitoring requirements for Ohio Power Gavin outfalls 0IB00006009 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Outfall 009						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Dissolved Solids	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M/RP[c]
Suspended Solids	mg/l	35	70	52.1	104	EP/PD
Ammonia-N	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M/RP[c]
pH	S.U.	- - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - - - - -		WQS
Copper, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M/RP[c]
Mercury, T.	ng/l	12	1700	0.000018	0.0026	WLA
Selenium, T. R.	µg/l	64	--	0.098	--	WLA
Bis(2-ethylhexyl) phthalate	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M/RP[c]
Whole Effluent Toxicity						
Acute	TUa	--	1.0	--	--	WET/WLA

[a] Effluent loadings based on average discharge flow of 0.393 MGD for suspended solids and 0.406 MGD for mercury and selenium.

[b] Definitions: BPJ = Best Professional Judgment; EP = Existing Permit; M = Monitoring; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ; WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; 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.

Table 25. Final effluent limits and monitoring requirements for Ohio Power Gavin outfalls 0IB00006010 and 0IB00006011 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Outfall 010/011						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Dissolved Solids	mg/l	1500	-	2210	--	WLA
Suspended Solids	mg/l	35	70	51	103	BPJ/EP
Ammonia-N	mg/l					
Summer		1.8	13.0	2.66	19.2	WLA
Winter		- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
pH	S.U.	- - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - - - - -		WQS
Chloride, T.	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Sulfate, T.	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Arsenic, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Copper, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Mercury, T.	ng/l	12	1700	0.000018	0.0026	WLA
Selenium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Whole Effluent Toxicity						
Acute	TUa	--	1.0	--	--	WET/WLA

[a] Effluent loadings based on an average discharge flow of 0.39 MGD.

[b] Definitions: BPJ = Best Professional Judgment; EP = Existing Permit; M = Monitoring; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ; WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; 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.