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 Struthers Wastewater Treatment Plant

Public Notice No.: 12-03-069
Public Notice Date: March 30, 2012
Comment Period Ends: April 30, 2012

OEPA Permit No.: 3PD00026*LD
Application No.: OH0027600

Name and Address of Applicant:

City of Struthers
6 Elm Street
Struthers, Ohio 44471

Name and Address of Facility Where Discharge Occurs:

Struthers Wastewater Treatment Plant
530 Lowellville Road
Struthers, Ohio 44471

Receiving Water: Mahoning River

Subsequent
Stream Network: Beaver River, Ohio River

## Introduction

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations, 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, 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 and Ohio Water Pollution Control Law (ORC 6111). Decisions to award variances to Water Quality Standards or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the Clean Water Act. 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 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 wasteload allocation for a pollutant to a measure of the effluent quality. The measure of effluent quality is called PEQ - Projected Effluent Quality. This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

## Summary of Permit Conditions

The effluent limits and monitoring requirements proposed for the following parameters are the same as in the current permit, although some monitoring frequencies have changed: flow, temperature, dissolved oxygen, $CBOD_5$, total suspended solids, ammonia-nitrogen, total phosphorus, nitrite+nitrate-nitrogen, total Kjeldahl nitrogen, oil and grease, pH, total residual chlorine, chromium, dissolved hexavalent chromium, copper, lead, nickel and zinc.

New water quality-based effluent limits are proposed for cadmium. Effluent data show that the Struthers plant has reasonable potential to cause a violation of water quality standards.

A lower monthly average water quality-based effluent limit is proposed for mercury because the City is no longer eligible for coverage under Ohio's mercury variance rule. A three-year interim limit and a requirement to conduct a pollutant minimization program also are proposed. The City also has the option of applying for an individual variance to the mercury water quality standard.

New final effluent limits are proposed for *Escherichia coli.* New water quality standards for *E. coli* became effective in March 2010.

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

New monitoring is proposed for total filterable residue (total dissolved solids) to obtain data to support future water quality-related evaluations of this parameter.

A 36 month compliance schedule is proposed for the City to evaluate and implement measures to maximize the ability of its existing treatment facilities to reduce effluent ammonia-N concentrations during the summer months.

In Part II of the permit, special conditions are included that address sanitary sewer overflow reporting; operator certification, minimum staffing and operator of record; a pollutant minimization program for mercury; whole effluent toxicity testing; and outfall signage.

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Procedures for Participation in the Formulation of Final Determinations

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

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

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

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

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

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

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

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

For additional information about this fact sheet or the draft permit, contact: John Kwolek, (330) 963-1251, John.Kwolek@epa.ohio.gov at our Northeast District Office; or Gary Stuhlfauth, (614) 644-2026, Gary.Stuhlfauth@epa.ohio.gov at our Central Office.

Location of Discharge/Receiving Water Use Classification

The Struthers wastewater treatment plant discharges to the Mahoning River at River Mile (RM) 14.32. The approximate location of the facility is shown in Figure 1.

This section of the Mahoning River is described by Ohio EPA River Code 18-001, USEPA River Reach #05030103-080, County: Mahoning, Ecoregion: Erie Drift Plain. The Mahoning River is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-25): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Class A Primary Contact Recreation (PCR).

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric water quality standards are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal Clean Water Act. Ohio WQS also include aquatic life use designations for waterbodies which can not meet the Clean Water Act 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 Struthers wastewater plant has an average design flow of 6.0 million gallons per day (MGD). The wet stream processes are influent pumping, screening, grit removal, scum removal, primary settling, preaeration, plastic media trickling filters, secondary clarification, chlorination and dechlorination. The City has converted six storm water tanks into an activated sludge train that treats septage and storm water. A portion of the daily wastewater flow is also directed into the activated sludge train to maintain the mixed liquor. Wastewater is disinfected in the final tank of the activated sludge train. It then combines with the trickling filter effluent prior to dechlorination and discharge through outfall 001. Solid stream processes include anaerobic digestion, sludge holding tanks, secondary sludge holding tanks, dewatering by belt press and disposal to a landfill. A new gas-to-electric generation system was activated in 2011 to produce electricity from digester gas. The electricity that is generated supplements the electricity requirements of the wastewater plant.

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

Two categorical industrial users discharge an average of 0.010 MGD to the Struthers plant. The City does not have an Ohio EPA approved industrial pretreatment program.

The Struthers wastewater plant is in compliance with industrial storm water regulations. It is covered under Ohio EPA's industrial storm water general permit, permit number 3GR00937*EG. Coverage was issued on February 20, 2012, and the general permit expires December 31, 2016.

Description of Existing Discharge

Table 1 presents chemical specific data collected by Ohio EPA.

Table 2 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 3PD00026001. Data are presented for the period January 2006 through December 2011, and current permit limits are provided for comparison.

Table 3 summarizes the chemical specific data for outfall 001 by presenting the average and maximum Projected Effluent Quality (PEQ) values.

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

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

Assessment of Impact on Receiving Waters

Figure 2 presents the large river assessment unit results for the Mahoning River mainstem downstream from Eagle Creek to the Pennsylvania border from the *Ohio 2010 Integrated Water Quality Monitoring and Assessment Report* (March 8, 2010; Ohio EPA). The complete report is available at the following Ohio EPA web site:

http://epa.ohio.gov/dsw/tmdl/2010IntReport/2010OhioIntegratedReport.aspx .

The next Ohio EPA survey of the Mahoning River is scheduled for 2013. A TMDL (total maximum daily loads) study to address impairments identified during the survey is scheduled for 2016.

In September 2004, U.S. EPA Region 5 finalized the *Mahoning River Total Maximum Daily Load (TMDL) for Fecal Coliform Bacteria*. The TMDL addresses segments of the Mahoning River where the Primary Contact designated use was impaired by fecal coliform, including Eagle Creek, downstream to Mosquito Creek and Mill Creek, and further downstream to the Pennsylvania border. The report identified fecal coliform reductions necessary to meet the Primary Contact recreational use. This report is available at the following Ohio EPA web site:

http://www.epa.ohio.gov/dsw/tmdl/MahoningRiverTMDL.aspx .

The most recently published Ohio EPA survey of the Mahoning River basin is the *Biological and Water Quality Study of the Mahoning River Basin* (Ohio EPA Technical Report MAS/1995-12-14; May 1, 1996). This report is available at the following Ohio EPA web site:

http://www.epa.ohio.gov/portals/35/documents/mahon94.pdf .

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. In addition, antidegradation and whole effluent toxicity issues must be addressed.

As in past modeling studies, all facilities discharging to the Mahoning River mainstem between the Leavittsburg dam and the Ohio-Pennsylvania boundary are considered interactive and are included in the wasteload allocation (WLA). The WLA contains a total of 23 outfalls from six municipal wastewater treatment plants (WWTP) and seven industrial facilities, as follows:

| | |
|---|---|
| Warren Steel Holdings (CSC Industries) | Thomas Steel Strip |
| RG Steel - Warren | ArcelorMittal-Warren |
| Warren WWTP | RMI-Niles |
| GenOn Niles Power | Niles WWTP |
| McDonald Steel | Campbell WWTP |
| Youngstown WWTP | Lowellville WWTP |
| Struthers WWTP | |

Four dischargers located on tributaries are allocated separately from the mainstem discharges: Meander Creek WWTP (Meander Creek), Girard WWTP (Little Squaw Creek), Mosquito Creek WWTP (Mosquito Creek), and Boardman WWTP (Mill Creek). Travel time to and distance from the Mahoning River are considered large enough that, for modeling purposes, the effluents from the respective treatment plants are considered non-interactive with the direct dischargers to the Mahoning. Effluents from these four treatment plants were allocated to meet water quality standards for the conditions, habitat, and use designation for their particular receiving waters and separate Permit Support Documents were prepared for each facility. Monitoring was conducted downstream of these dischargers or at the mouths of these tributaries, however, for inputs into the Mahoning River mainstem model. Figure 3 is a schematic of the Mahoning River study area.

*Parameter Selection* Effluent data for the Struthers wastewater plant were used to determine what parameters should undergo wasteload allocation. The parameters discharged are identified by the data available to Ohio EPA - Monthly Operating Report (MOR) data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

| | |
|---|---|
| Self-monitoring data | January 2006 through September 2011 |
| OEPA compliance sampling data | 2010 |

The data were examined for outliers, and the following values were eliminated from the data set: zinc – one value of 264 ug/l; and total residual chlorine – once value of 80 ug/l. .

This data is evaluated statistically, and Projected Effluent Quality (PEQ) values are calculated for each pollutant. Average PEQ ($PEQ_{avg}$) values represent the $95^{th}$ percentile of monthly average data, and maximum PEQ ($PEQ_{max}$) values represent the $95^{th}$ percentile of all data points. The average and maximum PEQ values are presented in Table 3.

The PEQ values are used according to Ohio rules to compare to applicable water quality standards (WQS) and allowable wasteload allocation (WLA) values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no wasteload allocation is done for that parameter. If either $PEQ_{avg}$ or $PEQ_{max}$ is greater than 25 percent of the applicable WQS, a wasteload allocation is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required. See Table 10 for a summary of the screening results.

*Water Quality Standards* Ohio water quality standards (WQS) were used for all parameters except for chronic cadmium, chronic hexavalent chromium, chronic iron, chronic lead, chronic selenium and total dissolved solids. The Mahoning River enters Pennsylvania at about river mile (RM) 11.43, and Pennsylvania WQS must be met at that point. The Pennsylvania Aquatic Life criteria and Human Health criteria were met at the state line for all other parameters (metals and organics).

*Flows in the Mahoning River* Flows in the Mahoning River are contributed by a series of reservoirs in the headwaters and on Mosquito Creek, controlled and mostly owned by the U.S. Army Corps of Engineers. Constructed several decades ago to provide adequate flow for the steel industry of the Mahoning River valley, the reservoirs are operated on a schedule to maintain specific seasonal flows at Leavittsburg and Youngstown. The operation of the reservoir system is discussed at length in earlier USEPA Mahoning River studies (Amendola et al., 1977; Schregardus and Amendola, 1984).

*Modeling Approach and Wasteload Allocations* Appropriate effluent concentrations for dischargers to the Mahoning River were determined using two models: a Monte Carlo model for the six commonly allocated metals (cadmium, total chromium, copper, lead, nickel, and zinc) and the conventional Ohio EPA conservative parameter model (CONSWLA) for all other parameters. The models and their applications are discussed in the sections that follow and model inputs are presented.

*Dissolved Metals Translators* A dissolved metals translator (DMT) is the factor used to convert a dissolved metal aquatic life criterion to an effective total recoverable aquatic life criterion with which a total recoverable aquatic life allocation can be calculated as required in the NPDES permit process. Currently, a DMT is based on site- or area-specific field data; each field data sample consists of a total recoverable measurement paired with a dissolved metal measurement. For the Mahoning River, there were 5 such paired samples available applicable to copper, lead, and silver. To account for the limited quantity of data, the DMT for each of these metals was determined as the lower end of the 95% confidence interval (1-tail) about the geometric mean of the total recoverable-to-dissolved ratios of the sample pairs. A DMT for zinc, cadmium, chromium, and nickel could not be determined due to shortcomings in the data. Each DMT is metal-specific and is applied by multiplying the dissolved criteria by the DMT, resulting in total effective recoverable criteria which can be used in the wasteload allocation procedures.

<u>The Monte Carlo Model</u>

The application of the Monte Carlo method was limited to the six commonly allocated metals (cadmium, total chromium, copper, lead, nickel, and zinc). Previous allocations using the conventional Ohio EPA conservative parameter model resulted in stringent limits for these parameters that have been difficult for dischargers to maintain. As a result, Ohio EPA was asked to consider other methods for determining effluent limits that would adequately protect the river while allowing the dischargers some relief. The Monte Carlo method addresses these concerns, but does not guarantee more favorable discharge limits. This is the fifth permit cycle where a Monte Carlo method was used to determine the wasteload allocations for the six metals listed above.

Conventional water quality modeling methods project the receiving water pollutant concentration which will occur under critical low-flow conditions. The Monte Carlo probabilistic method, as applied to water quality modeling, projects the year-round probability distribution for the pollutant. This allows a more accurate determination of the frequency at which water quality criteria are violated or maintained. Conventional modeling methods, when applied to systems with numerous dischargers, may be overly conservative because they model all dischargers at their maximum permitted concentration. (The conventional methods assume that all facilities will simultaneously discharge at their permit limits during critical stream flow conditions, the probability of which decreases significantly as the number of discharges increases.) The Monte Carlo method accounts for the independent variability of discharges as well as other model inputs.

The Monte Carlo model for the Mahoning River was originally developed by Limno-Tech, Inc., for their 1993 study to determine alternative copper limits for Thomas Strip Steel. The model combines the Monte Carlo statistical method with a multi-discharge mass-balance model and allows upstream flow to be input from a historical gaging station flow record to account for unusual flow fluctuations caused by the numerous upstream dams and reservoirs. Ohio EPA approved the alternative limits developed using this model and received permission to modify and apply the model in the future. The original model was written in 1992-1993 in Borland Pascal. For this permit cycle, the model has been modified by the Ohio EPA and re-written in the 'C' programming language.

*River Hardness and Water Quality Criteria* Water quality criteria for the six metals depends on instream hardness. Thus, hardness is a key element in determining effluent limits. A detailed analysis of the available hardness and flow data was conducted. This analysis revises and updates the Ohio EPA analysis previously performed in 2006. Stream hardness data was taken from the two main STORET stations on the Mahoning River main stem, at Leavittsburg, Ohio (RM 45.51) and at Lowellville, Ohio (RM 12.42). The hardness data for the two stations was analyzed for the period October 2000 to September 2010.

A linear correlation between the Leavittsburg USGS gaging station flow and instream hardness was determined for both STORET stations. These correlations were then used to calculate hardness as a function of river mile at 129 cfs (Leavittsburg 1Q10 low flow) and 136 cfs (7Q10 low flow).

<u>Acute Criteria, at 1Q10</u>

river hardness (mg/L) = (-0.682)(river mile) + 185.82

<u>Chronic Criteria, at 7Q10</u>

river hardness (mg/L) = (-0.681)(river mile) + 185.62

Discharger hardness was calculated with these equations. This relationship established local river hardness for calculating outside-mixing-zone, hardness-dependent criteria in the Monte Carlo model. Inside-mixing-zone, maximum criteria were determined with effluent hardness data when available, or outside-mixing-zone hardness when effluent data was unavailable.

Table 5 contains the water quality criteria for the six metals in the vicinity of the Struthers wastewater plant.

This Monte Carlo method uses a seven-day averaging period with a ten-year return period for meeting chronic (average) water quality criteria. A one-day averaging period with a ten-year return period is used for meeting the acute (maximum) water quality criteria. Since the chronic aquatic life criteria are less than or approximate to both the agriculture and human health criteria and since the return periods for both agriculture and human health criteria would be longer than ten years, the allocations that meet the average aquatic life criteria will be protective of the agriculture and human health criteria as well.

Federal rules require that a downstream state's water quality criteria be considered when calculating effluent limits. The Pennsylvania state line is at RM 11.43. Pennsylvania's standards are the same as Ohio's for copper, total chromium, nickel, and zinc. However, Pennsylvania's standards for cadmium and lead are more stringent than Ohio's and had to be considered. Since Pennsylvania uses, in effect, a one hundred-day return period, Ohio's acute criteria for those two metals, in combination with a ten-year return period, still meet Pennsylvania's water quality criteria. However, the same is not true for the chronic criteria.

*Data Analysis for the Monte Carlo Model* The Monte Carlo method accounts for individual system component variability by generating probability distributions that predict a range of possible input conditions. These distributions are derived from the mean and the coefficient of variation input by the user and based on field data for each of these components. Table 6 lists the calculated mean and coefficient of variation for such system characteristics as background/ambient concentrations and discharger and tributary flows.

<u>The Conservative Substance Wasteload Allocation Model (CONSWLA)</u>

The CONSWLA model was used to allocate all parameters not included in the Monte Carlo model. CONSWLA is the model Ohio EPA typically uses in multiple discharger situations. Different from the Monte Carlo model previously described, CONSWLA model inputs for flow are fixed at their critical low levels and inputs for effluent flow are fixed at their design or 50th percentile levels. Background concentrations are fixed at a representative value (generally a 50th percentile).

Pollutants are allocated by a mass-balance method. Wasteload allocations using this method are done using the following general equation: Discharger WLA = (downstream flow x WQS) - (upstream flow x background concentration). Discharger WLAs are divided by the discharge flow so that the allocations are expressed as concentrations. This technique is appropriate when data bases are unavailable to generate statistical distributions for inputs (like those used in the Monte Carlo method) and if the parameters modeled are conservative.

*Wasteload Allocation* For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio Water Quality Standards (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 | Annual 7Q10 |
| | Maximum | Annual 1Q10 |
| Ammonia | Average | Summer 30Q10 |
| | | Winter 30Q10 |
| Agricultural Water Supply | | Harmonic mean flow |
| Human Health (nondrinking) | | Harmonic mean flow |

Allocations are developed using a percentage of stream design flow as specified in Table 8, and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

Ohio's water quality standard implementation rules [OAC 3745-2-05(A)(2)(d)(iv)] required a phase out of mixing zones for bioaccumulative chemicals of concern (BCCs) as of November 15, 2010. This rule applied statewide. Mercury is a BCC. The mixing zone phase-out means that as of November 15, 2010 all dischargers requiring mercury limits in their NPDES permit must meet water quality standards at the end-of-pipe, which are 12 ng/l (average) and 1700 ng/l (maximum) in the Ohio River basin.

The data used in the CONSWLA modeling are listed in Tables 7 and 8. The wasteload allocation results to maintain all applicable criteria are presented in Table 9. This table includes results from both the Monte Carlo and the CONSWLA modeling.

The modeling procedure used to evaluate the current ammonia-nitrogen discharges from the Struthers plant, which are at levels typical of a secondary treatment plant, was not rigorous enough to use as the basis for water quality-based effluent limits. Since 2008, the plant has been doing a better job of reducing ammonia-N levels in the effluent.

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

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

The wasteload allocation calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit ($TU_c$) and 7Q10 flow for the average and the acute toxicity unit ($TU_a$) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. An assessment of biological and hydraulic data in the vicinity of the Warren wastewater plant indicated that the effluent acute toxicity is interactive with ISG Mittal Steel and the Warren Consolidated Industries discharges. For the Warren wastewater plant, the wasteload allocation values are 1.0 $TU_a$ and 32.9 $TU_c$.

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

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

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

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

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

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

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

<u>Reasonable Potential/ Effluent Limits/Hazard Management Decisions</u>

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the water quality standards 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 wasteload allocation based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum wasteload allocations are selected from Table 9. The average PEL ($PEL_{avg}$) is compared to the average PEQ ($PEQ_{avg}$) from Table 3, and the $PEL_{max}$ is compared to the $PEQ_{max}$. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 10.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 11 presents the final effluent limits and monitoring requirements proposed for Struthers outfall 3PD00026001 and the basis for their recommendation.

Based on best engineering judgment, it is proposed that the current limits for dissolved oxygen, total suspended solids, 5-day carbonaceous biochemical oxygen demand ($CBOD_5$) and total residual chlorine continue. The limits for suspended solids and $CBOD_5$ are technology-based treatment standards included in 40 CFR Part 133, Secondary Treatment Regulation. Secondary treatment is defined by the Best Practicable Waste Treatment Technology criteria, which are minimum standards required of all publicly owned treatment works.

Continued monitoring of ammonia-nitrogen is proposed. Since 2008, the plant has been doing a better job of reducing ammonia-N levels in the effluent. The results of nine acute whole effluent toxicity tests of the Struthers effluent conducted from April 2006 through October 2010 did not show any evidence of toxicity, which can be a problem for secondary treatment plants.

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

The *2010 Ohio Integrated Water Quality Monitoring and Assessment Report* (Ohio EPA) lists the Mahoning River as impaired for aquatic life. Nutrients and organic enrichment/dissolved oxygen are listed as causes of impairment, and major municipal point sources are listed among the sources. Considering this information and the fact that municipal wastewater treatment plants discharge a nutrient load to the river, continued monitoring for phosphorus, nitrite+nitrate and total Kjeldahl nitrogen is proposed based on best engineering judgment. Monitoring for phosphorus and nitrite+nitrate at the upstream and downstream stations also is proposed. The purpose of the monitoring is to maintain a nutrient data set for use in the future TMDL (total maximum daily loads) study.

The Ohio EPA risk assessment (Table 10) places cadmium and mercury in group 5. This placement as well as the data in Tables 2 and 3 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 wasteload allocation or the PEQ is between 75 and 100 percent of the wasteload allocation and certain conditions exist that increase the risk to the environment. Pollutants that meet this requirement must have permit limits under OAC Rule 3745-33-07(A)(1). The proposed limits are based on wasteload allocation (Table 9).

Under its current permit, Struthers had coverage under Ohio's mercury variance rule and had a monthly average variance-based limit of 38 ng/l. To be eligible for coverage under the mercury variance rule, a discharger must maintain a running annual average mercury effluent concentration equal to or less than 12 mg/l. Effluent data show that about half of the mercury data reported by the City is greater than 12 ng/l, and the City is not consistently able to achieve the 12 ng/l average annual mercury effluent concentration. As a result, the City is no longer eligible for variance coverage.

The Agency proposes the following provisions in regards to mercury:

- An interim monthly average mercury limit of 31 ng/l;
- A requirement for the City to implement a pollutant minimization program for mercury; and
- A final monthly average mercury limit of 12 ng/l that becomes effective 36 months from the effective date of the permit.

The City has the option to apply for an individual variance to the mercury water quality standard. Variances can be issued for certain reasons, one being that having to comply with a limit necessary to meet water quality standards would result in "substantial and widespread economic and social impact." U.S. EPA guidance is available on the information that a discharger must submit and the state must compile as part of the application for an individual variance. All variances must be approved by U.S. EPA.

Based on best engineering judgment, monitoring is proposed for total filterable residue (total dissolved solids).

Ohio EPA evaluated instream total dissolved solids (TDS) data collected in the Mahoning River at Lowellville, approximately one mile from the Ohio-Pennsylvania border (n = 128, range = 164 – 650 mg/l, period of record = January 1999 – January 2012). The Agency calculated summer and winter concentrations to characterize instream TDS levels. These concentrations are 95th percentiles of the monthly averages and daily values of the data. The calculated values are: monthly average – 364 mg/l (S), 456 mg/l (W); maximum – 423 mg/l (S), 587 mg/l (W).

These values are lower than the monthly average and maximum Pennsylvania TDS standards, 500 mg/l and 750 mg/l. This demonstrates that currently there is not reasonable potential for the instream TDS concentration to exceed the Pennsylvania standards at Lowellville, close to the state line. Based on this finding, water quality based effluent limits for TDS are not currently necessary for Ohio wastewater facilities discharging at their existing TDS loads.

Ohio EPA is pursuing a plan to begin regular TDS monitoring at a site in the lower part of the Mahoning River in Ohio. This monitoring would provide additional baseline data on ambient TDS concentrations with Ohio facilities discharging at their existing TDS loads. The Agency will consider options for reducing the TDS load to the Mahoning River if an upward trend in the ambient concentration is observed

Ohio EPA will evaluate proposals for new or increased TDS loadings to the Mahoning River from Ohio NPDES dischargers, which could be subject to provisions of Ohio's antidegradation rule (OAC 3745-1-05).

Ohio EPA risk assessment (Table 10) places total chromium, dissolved hexavalent chromium, copper, lead, nickel and zinc in groups 2 and 3. This placement as well as the data in Tables 2 and 3 support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring is proposed to document that these pollutants continue to remain at low levels.

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

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

*Whole Effluent Toxicity Reasonable Potential*
Annual acute toxicity monitoring is proposed for the life of the permit. Evaluating the toxicity data presented in Table 4 and other pertinent data under the provisions of OAC 3745-33-07(B) placed the Struthers wastewater plant in Category 4 with respect to whole effluent toxicity. While this indicates that the plant's effluent does not currently pose a toxicity problem, annual toxicity testing is proposed consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). The proposed monitoring will adequately characterize toxicity in the plant's effluent.

<u>Other Requirements</u>

*Schedule of Compliance*
A six month compliance schedule is proposed for the City to submit a technical justification for either revising its local industrial user limits or retaining its existing local limits.

Ohio EPA water quality modeling indicated an average summer ammonia-N concentration as low as 5.6 mg/l could be necessary to protect the water quality standard for ammonia toxicity. The Struthers plant currently discharges ammonia-N at concentrations higher than this, though since 2008, the plant has been doing a better job of reducing effluent ammonia-N levels. A 36 month compliance schedule is proposed for the City to evaluate and implement measures to maximize the ability of its existing treatment facilities to reduce effluent ammonia-N concentrations during the summer months.

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

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

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

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

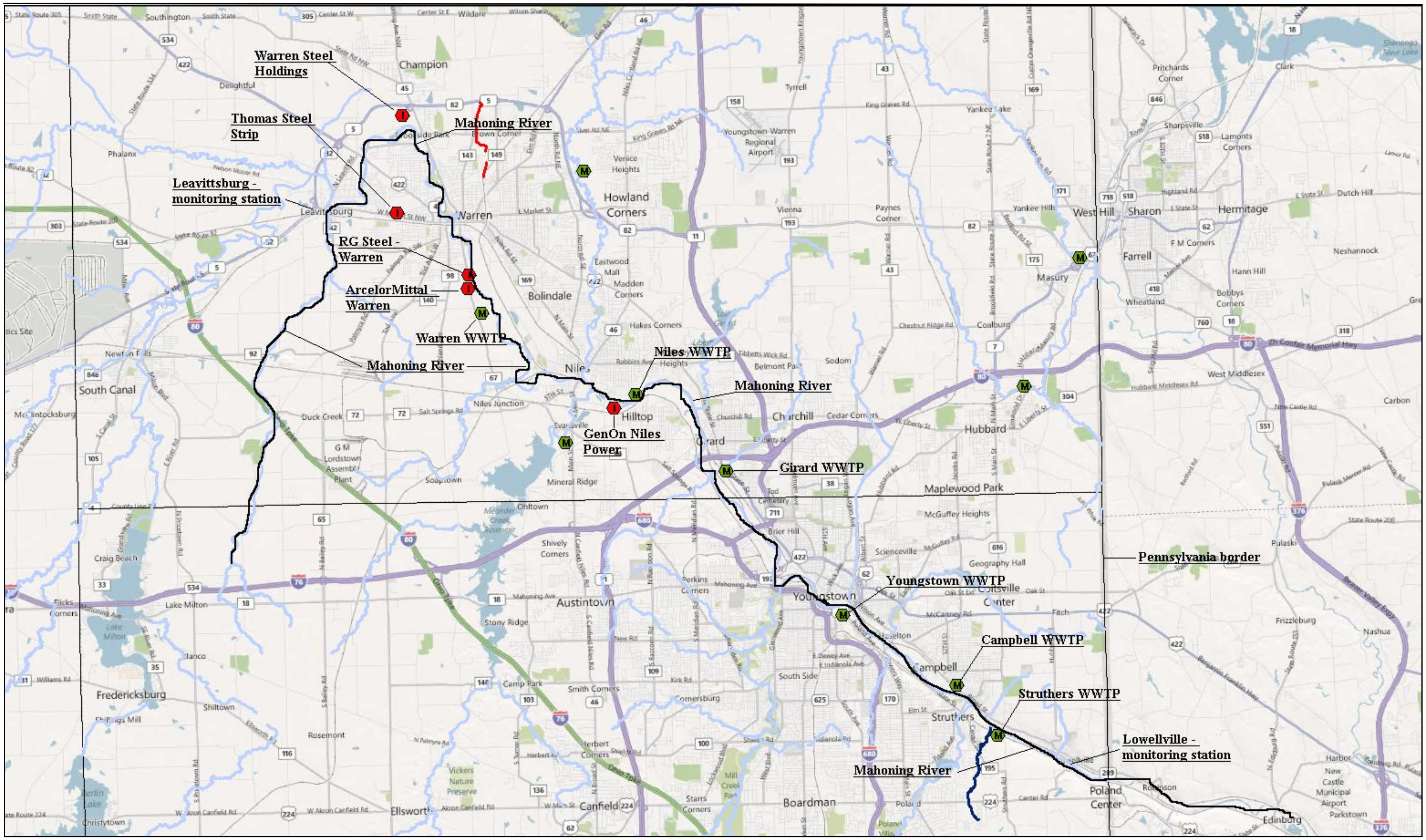


Figure 1. Location of Struthers wastewater treatment plant and other Mahoning dischargers.

**Table 1. Effluent Characterization Using Ohio EPA Data**

Summary of analytical results for Struthers outfall 3PD00026001. Units ug/l unless otherwise noted; OEPA = data from analyses by Ohio EPA.

| PARAMETER | OEPA 10/05/10 |
|---|---|
| Arsenic | 2.0 |
| Barium | 17 |
| Chloride (mg/l) | 128 |
| Chromium | 4.3 |
| Copper | 9.4 |
| Dissolved solids, total (mg/l) | 652 |
| Iron | 215 |
| Nickel | 5.0 |
| Nitrite+Nitrate-N (mg/l) | 13.6 |
| Phosphorus, T (mg/l) | 2.63 |
| Strontium | 320 |
| Zinc | 41 |
| Bromodichloromethane | 1.39 |
| Bromomethane | 3.91 |
| Chloroform | 1.89 |
| Tetrachloroethene | 0.59 |

**Table 2. Effluent Characterization Using Self-Monitoring Data**

Summary of current permit limits and unaltered discharge monitoring report data for Struthers outfall 3PD00026001 (January 2006 – September 2011). All values are based on annual records unless otherwise indicated. * = For minimum pH, 5th percentile shown in place of 50th percentile; ** = For dissolved oxygen, 5th percentile shown in place of 95th percentile; a = weekly average.

| Parameter | Season | Units | Current Permit Limits | | # Obs. | Percentiles | | Data Range |
|---|---|---|---|---|---|---|---|---|
| | | | 30 day | Daily | | 50th | 95th | |
| Water Temperature | Annual | C | Monitor | | 2095 | 14.9 | 21.2 | 7.1-22.6 |
| Dissolved Oxygen | Summer | mg/l | | 5.0 min | 1072 | 6.46 | 5.1** | 5-8.59 |
| Dissolved Oxygen | Winter | mg/l | | 5.0 min | 1026 | 7.49 | 5.6** | 4.85-55.9 |
| Total Suspended Solids | Annual | mg/l | 30 | 45[a] | 857 | 15.6 | 40.4 | 0-107 |
| Oil and Grease, Total | Annual | mg/l | | 10 | 88 | 5.8 | 9.52 | 0-16.8 |
| Oil and Grease, Hexane | Annual | mg/l | | 10 | 76 | 3.8 | 8.3 | 0-16.7 |
| Nitrogen, Ammonia (NH3) | Summer | mg/l | Monitor | | 420 | 4.7 | 17.6 | 0.29-25 |
| Nitrogen, Ammonia (NH3) | Winter | mg/l | Monitor | | 429 | 5.1 | 13 | 0-17.7 |
| Nitrogen Kjeldahl, Total | Annual | mg/l | Monitor | | 148 | 8.13 | 18.7 | 2.48-29.2 |
| Nitrite Plus Nitrate, Total | Annual | mg/l | Monitor | | 144 | 8.87 | 18.5 | 0-22.7 |
| Phosphorus, Total (P) | Annual | mg/l | Monitor | | 303 | 2.76 | 7.33 | 0.56-7.56 |
| Nickel, Total Recoverable | Annual | ug/l | Monitor | | 75 | 1.77 | 6.44 | 0-12.1 |
| Silver, Total Recoverable | Annual | ug/l | -- | | 31 | 1.1 | 2.8 | 0-3.08 |
| Zinc, Total Recoverable | Annual | ug/l | Monitor | | 74 | 37.9 | 71.5 | 0-264 |
| Cadmium, Total Recoverable | Annual | ug/l | Monitor | | 74 | 0 | 0.32 | 0-3.1 |
| Lead, Total Recoverable | Annual | ug/l | Monitor | | 75 | 0.72 | 4.07 | 0-20.5 |
| Chromium, Total Recoverable | Annual | ug/l | Monitor | | 74 | 1.96 | 4.94 | 0-7.96 |
| Copper, Total Recoverable | Annual | ug/l | Monitor | | 74 | 9.85 | 23.1 | 0-41.1 |
| Chromium, Dissolved Hexavalent | Annual | ug/l | Monitor | | 68 | 0 | 10.1 | 0-15.8 |
| Fecal Coliform | Annual | #/100 ml | 1000 | 2000[a] | 423 | 25 | 1020 | 0-14300 |
| Flow Rate | Summer | MGD | Monitor | | 1073 | 4.05 | 6.91 | 1.99-9.43 |
| Flow Rate | Winter | MGD | Monitor | | 1025 | 4.84 | 7.95 | 2.04-10.2 |
| Flow Rate | Annual | MGD | Monitor | | 2098 | 4.43 | 7.62 | 1.99-10.2 |
| Chlorine, Total Residual | Annual | mg/l | | 0.024 | 1073 | 0 | 0 | 0-0.08 |
| Mercury, Total (Low Level) | Annual | ng/l | 38 | 1700 | 63 | 12.8 | 35.4 | 2.21-78.7 |
| Mercury, Total (Low Level) | Annual | ng/l | 38 | 1700 | 10 | 10.6 | 20.7 | 7.02-23 |
| pH, Maximum | Annual | S.U. | | 9.0 | 2095 | 7.33 | 7.62 | 6.33-8.11 |
| pH, Minimum | Annual | S.U. | | 6.5 | 2095 | 6.85* | 7.49 | 6.3-9.89 |
| CBOD 5 day | Summer | mg/l | 25 | 40[a] | 418 | 10.2 | 25.8 | 0-43 |
| CBOD 5 day | Winter | mg/l | 25 | 40[a54] | 427 | 12.1 | 29.3 | 0-57.9 |

**Table 3. Projected Effluent Quality Values**

| Parameter | Units | | # of Samples | # > MDL | Average PEQ | Maximum PEQ |
|---|---|---|---|---|---|---|
| Self-Monitoring (DMR) Data | | | | | | |
| Ammonia | mg/L | S | 288 | 288 | 11.29 | 23.72 |
| Ammonia | mg/L | W | 222 | 221 | 9.095 | 19.21 |
| Nitrite+Nitrate [B] | mg/L | | 145 | 143 | 17.36 | 25.50 |
| Phosphorus [B] | mg/L | | 304 | 304 | 4.773 | 6.653 |
| Nickel [B] | µg/L | | 76 | 43 | 5.037 | 7.877 |
| Zinc [B] | µg/L | | 74 | 73 | 55.41 | 73.15 |
| Cadmium | µg/L | | 74 | 8 | 2.037 | 2.790 |
| Lead | µg/L | | 75 | 45 | 3.689 | 5.622 |
| Chromium, tot. rec. [B] | µg/L | | 75 | 62 | 4.297 | 6.591 |
| Copper [B] | µg/L | | 75 | 69 | 18.61 | 27.20 |
| $Chromium^{+6}$, diss. | µg/L | | 68 | 6 | 8.615 | 12.84 |
| Chlorine, tot. res. | µg/L | | 1072 | 0 | -- | -- |
| Mercury | ng/L | | 63 | 63 | 30.81 | 47.50 |
| OEPA Data | | | | | | |
| Arsenic | µg/L | | 1 | 1 | 9.052 | 12.4 |
| Barium | µg/L | | 1 | 1 | 76.94 | 105.4 |
| Chloride | mg/L | | 1 | 1 | 579.3 | 793.6 |
| Total Dissolved Solids | mg/L | | 1 | 1 | 2951. | 4042. |
| Iron | µg/L | | 1 | 1 | 973.1 | 1333. |
| Strontium | µg/L | | 1 | 1 | 1448. | 1984. |
| Bromodichloromethane [A] | µg/L | | 1 | 1 | 6.291 | 8.618 |
| Bromomethane | µg/L | | 1 | 1 | 17.70 | 24.24 |
| Chloroform | µg/L | | 1 | 1 | 8.554 | 11.72 |
| Tetrachloroethene [A] | µg/L | | 1 | 1 | 2.670 | 3.658 |

[A] Carcinogen
[B] OEPA data was combined with the DMR data.

## Table 4. Summary of Acute Toxicity Test Results

| Test Date(a) | *Ceriodaphnia dubia 48 hours* | | | *Fathead Minnows 96 hours* | | |
|---|---|---|---|---|---|---|
| | UP[b] | TUa[h] | NF[i] | UP[b] | TUa[h] | NF[i] |
| 04/04/06(E) | BD | BD | NT | BD | BD | NT |
| 10/10/06(E) | BD | BD | NT | BD | BD | NT |
| 10/15/07(E) | BD | BD | NT | BD | BD | NT |
| 04/30/08(E) | BD | BD | NT | BD | BD | NT |
| 10/08/08(E) | BD | BD | NT | 35 | BD | NT |
| 10/06/09(E) | BD | BD | NT | BD | BD | NT |
| 10/05/10(E) | BD | BD | NT | BD | BD | NT |
| 05/10, 11/10(O)* | BD | BD | BD | BD | BD | BD |
| 10/04, 05/10(O)* | BD | BD | BD | BD | BD | BD |
| | | | | | | |

[a] O = EPA test; E = entity test
[b] UP = upstream control water
[h] TUa = acute toxicity units
BD = below detection
[i] NF = near field sample in Mahoning River
NT = not tested
* = acute screening test

Division of Surface Water Large River Assessment Unit Summary

Overview Information

Waterbody: Mahoning River

Segment: Eagle Creek to Pennsylvania border

Length: 37.00 miles

Priority Points: 6

Monitoring Scheduled: 2013

TMDL Scheduled: 2016

Aquatic Life Use Assessment

Reporting Category: 5x

Aquatic Life Uses: WWH

Sampling Years: 1997, 2002, 2003, 2006

Sites Monitored: 14

Total Miles Monitored: 16.00

Assessment Unit Score: 47.5

Miles in Full Attainment: 7.60 (47.50%)

Miles in Partial Attainment: 3.40 (21.30%)

Miles in Non Attainment: 5.00 (31.20%)

Most Recent Data

| Year Assessed | Station Name | River Mile | Drainage Area | Aquatic Life Use | Attainment Status |
|---|---|---|---|---|---|
| 2006 | MAHONING R. AT WARREN @ 3RD ISLAND DST. SUMMIT ST. | 39.08 | 594 | WWH | Full |
| 2006 | MAHONING R. AT WARREN @ WEST MARKET ST. | 38.26 | 594 | WWH | Full |
| 2006 | MAHONING R. NEAR YOUNGSTOWN SHEET & TUBE, CAMPBELL | 17 | 1018 | WWH | Non |
| 2006 | MAHONING R. AT LTV STEEL CAMPBELL @ POLAND AVE. | 16.46 | 1022 | WWH | Non |
| 2006 | MAHONING R. DST. LTV 039, UPST. 041 | 16.1 | 1022 | WWH | Non |

Causes of Impairment

cause unknown
chlorine
direct habitat alterations
metals
nutrients
oil and grease
organic enrichment/DO
priority organics
thermal modifications

Sources of Impairment

combined sewer overflows
contaminated sediments
dam construction - development
flow regulation/modification - development
hazardous wastes
major municipal point source
minor industrial point source
source unknown
spills
urban runoff/storm sewers (NPS)

Comments: The WWH aquatic life use for the Mahoning River mainstem was listed as impaired based on historical data in the 2006 Integrated Report. For the 2008 report, aquatic life data from several small surveys conducted between 1997 and 2006 were included to update the mainstem assessment. Mainstem coverage was somewhat limited in that only 16 of 37 mainstem miles were considered assessed based on these small surveys. Aquatic life use status of the remaining 21 miles remains unknown. Identified causes and sources based on the intensive survey conducted in 1994 were carried over to this Integrated Report.

Recreation Use Assessment

Reporting Category: 3i

Assessment Unit Score: Not calculated

Public Drinking Water Supply Assessment

Reporting Category: 0

Cause of Impairment: None

Nitrate Watch List: No

Fish Tissue Assessment

Reporting Category: 5

Causes of Impairment: PCBs

PCB Concentration: 531 ppb

Figure 2. Large River Assessment Unit Summary from the *Ohio 2010 Integrated Water Quality Monitoring and Assessment Report.*

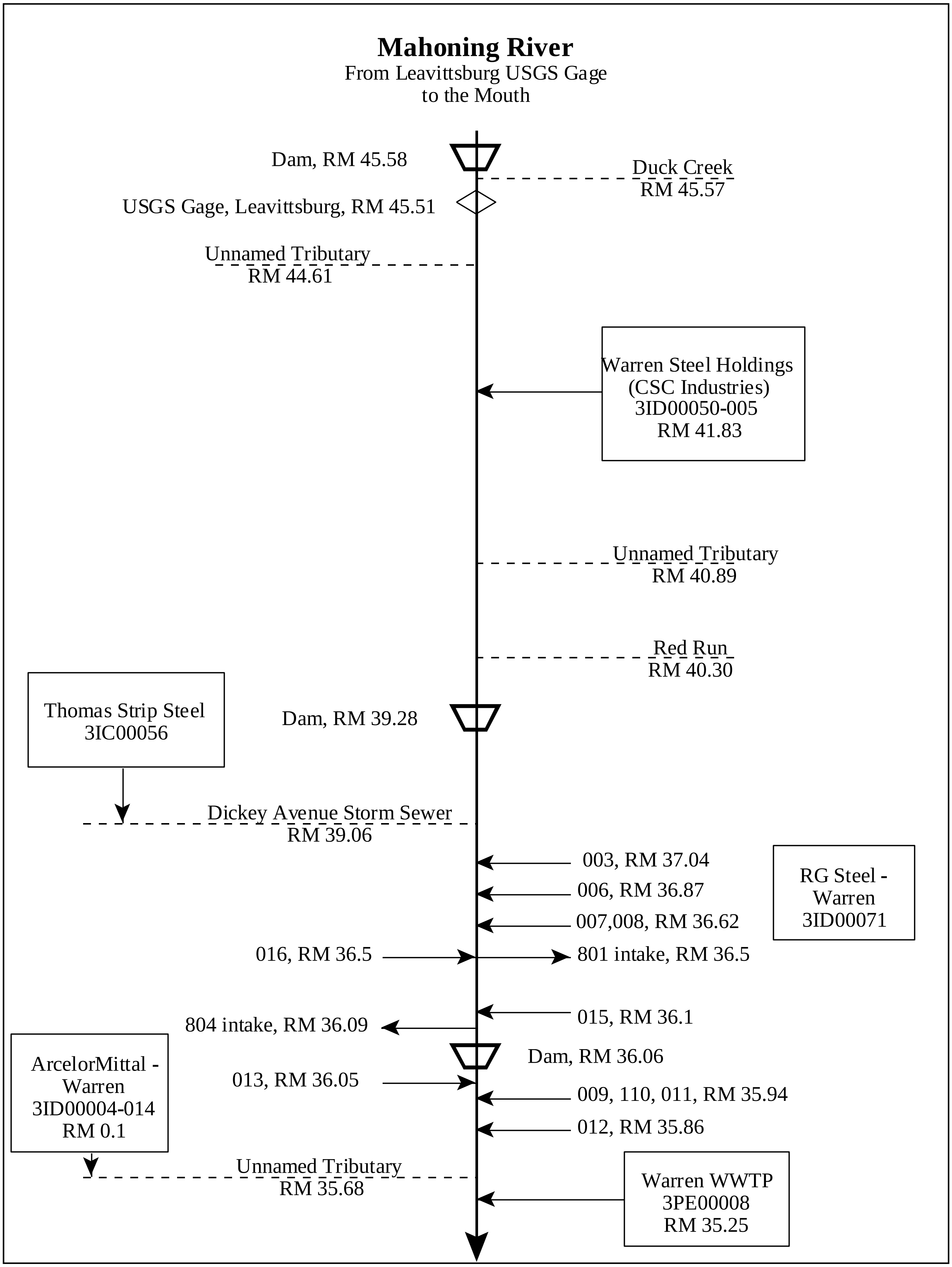


Figure 3. Mahoning River Study Area

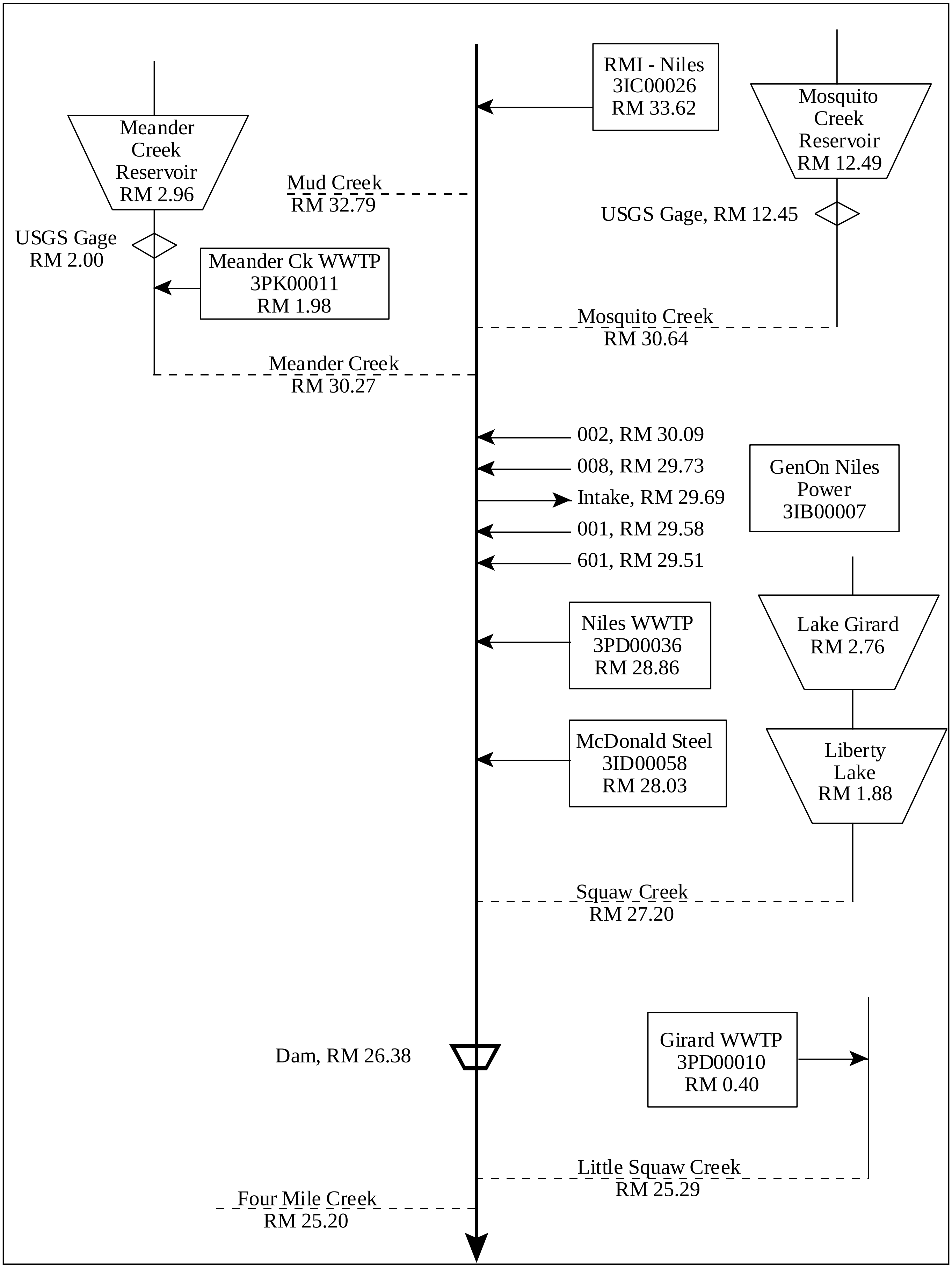

Figure 3. Mahoning River Study Area (Continued)

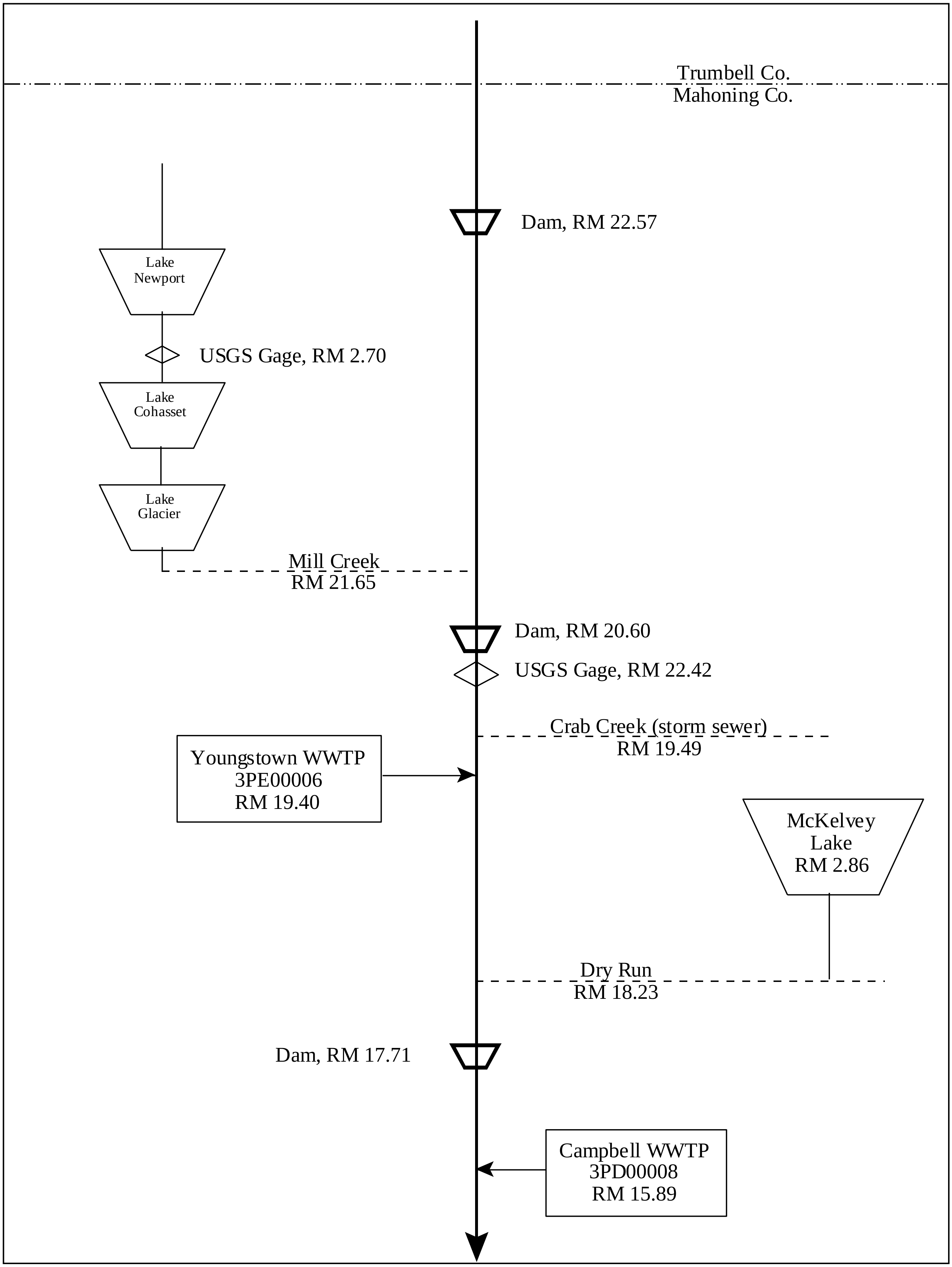

Figure 3. Mahoning River Study Area (Continued)

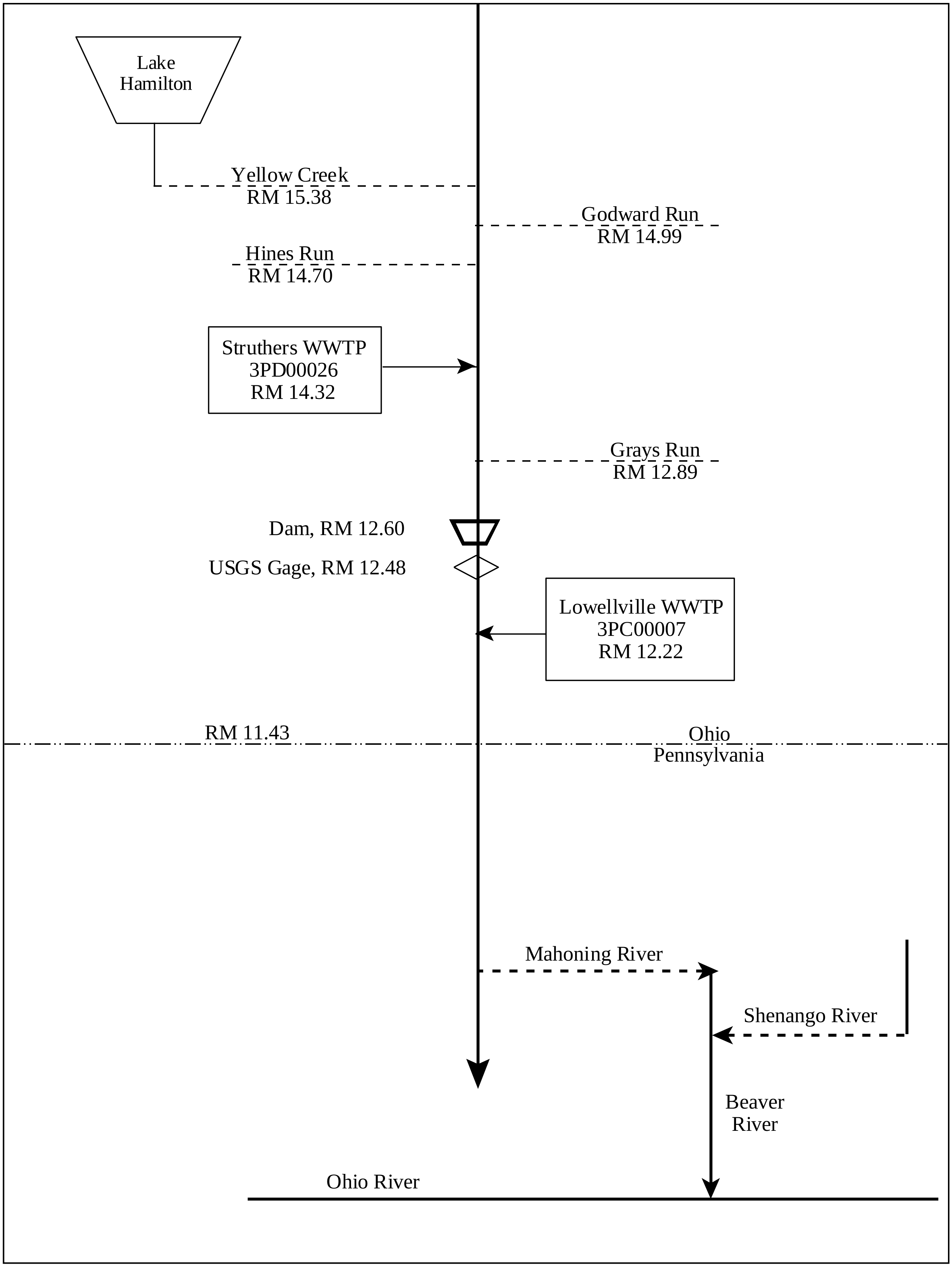


Figure 3. Mahoning River Study Area (Continued)

**Table 5. Water Quality Criteria for Monte Carlo Model Parameters (Struthers WWTP)**

| | Outside Mixing Zone Criteria | | | | Inside Mixing |
|---|---|---|---|---|---|
| | Average | | | Maximum | |
| Parameter (µg/L) | Human Health | Agri-culture[A] | Aquatic Life[B] | Aquatic Life[B] | Zone Maximum[C] |
| Cadmium | - | 50. | 0.4 [E] | 8.5 | 23. |
| Chromium, total | - | 100. | 140. | 2900. | 7100. |
| Copper | 1300. | 500. | 16.[D] | 25.[D] | 61. |
| Lead | - | 100. | 6.0 [D,E] | 260.[D] | 700. |
| Nickel | 610.[E] | 200. | 84. | 760. | 1900. |
| Zinc | 69000. | 25000. | 190. | 190. | 480. |

[A] There is some uncertainty regarding the return period used to develop the Agricultural Water Supply (AWS) criteria. Therefore, the AWS criteria for the Monte Carlo model are presented for information purposes only.
[B] Based on river hardness of 176 mg/L.
[C] Based on effluent hardness of 228 mg/L.
[D] Effective Criteria Based on Application of Dissolved Metal Translator.
[E] Pennsylvania WQC at the state line.

**Table 6. Monte Carlo Model Inputs**

| Parameter | Mean | Coefficient of Variation | | Source |
|---|---|---|---|---|
| | | Acute | Chronic | |
| Mahoning River at Leavittsburg | | | | |
| Flow (MGD)[A] | -- | -- | -- | USGS |
| Cadmium (µg/L) | 0.0 | 0.0 | 0.0 | STORET |
| Chromium, total (µg/L) | 0.0 | 0.0 | 0.0 | STORET |
| Copper (µg/L) | 2.1 | 0.31 | 0.12 | STORET |
| Lead (µg/L) | 0.0 | 0.0 | 0.0 | STORET |
| Nickel (µg/L) | 2.8 | 0.18 | 0.07 | STORET |
| Zinc (µg/L) | 0.0 | 0.0 | 0.0 | STORET |
| Mosquito Creek at mouth | | | | |
| Flow (MGD) | 80.9 | 1.44 | 0.54 | USGS/SWIMS |
| Cadmium (µg/L) | 0.25 | 2.7 | 1.0 | STORET |
| Chromium, total (µg/L) | 0.0 | 0.0 | 0.0 | STORET |
| Copper (µg/L) | 2.4 | 0.7 | 0.27 | STORET |
| Lead (µg/L) | 0.0 | 0.0 | 0.0 | STORET |
| Nickel (µg/L) | 0.94 | 0.65 | 0.25 | STORET |
| Zinc (µg/L) | 11.3 | 1.3 | 0.47 | STORET |
| Meander Creek at mouth | | | | |
| Flow (MGD) | 3.61 | 0.3 | 0.11 | SWIMS |
| Cadmium (µg/L) | 0.0 | 0.0 | 0.0 | STORET |
| Chromium, total (µg/L) | 1.3 | 0.97 | 0.37 | STORET |
| Copper (µg/L) | 6.0 | 0.92 | 0.35 | STORET |
| Lead (µg/L) | 0.0 | 0.0 | 0.0 | STORET |
| Nickel (µg/L) | 8.1 | 1.4 | 0.53 | STORET |
| Zinc (µg/L) | 40. | 1.3 | 0.48 | STORET |
| Little Squaw Creek at mouth | | | | |
| Flow (MGD) | 3.6 | 0.44 | 0.17 | SWIMS |
| Cadmium (µg/L) | 0.15 | 2.7 | 1.0 | SWIMS |
| Chromium, total (µg/L) | 3.2 | 0.35 | 0.13 | SWIMS |
| Copper (µg/L) | 12. | 0.60 | 0.23 | SWIMS |
| Lead (µg/L) | 0.0 | 0.0 | 0.0 | SWIMS |
| Nickel (µg/L) | 9.8 | 0.87 | 0.33 | SWIMS |
| Zinc (µg/L) | 64. | 0.80 | 0.30 | SWIMS |

**Table 6.  Monte Carlo Model Inputs (continued)**

| Parameter | | Mean | Coefficient of Variation Acute | Coefficient of Variation Chronic | Source |
|---|---|---|---|---|---|
| Mill Creek at mouth | | | | | |
| Flow (MGD) | | 44.5 | 2.2 | 0.84 | USGS |
| Cadmium (µg/L) | | 0.12 | 0.48 | 0.18 | STORET |
| Chromium, total (µg/L) | | 0.0 | 0.0 | 0.0 | STORET |
| Copper (µg/L) | | 2.4 | 0.70 | 0.26 | STORET |
| Lead (µg/L) | | 4.1 | 1.9 | 0.74 | STORET |
| Nickel (µg/L) | | 28.1 | 0.30 | 0.11 | STORET |
| Zinc (µg/L) | | 13.5 | 1.87 | 0.71 | STORET |
| Discharger flows (MGD) | | | | | |
| Warren Steel Holdings (CSC) | | 0.76 | 0.94 | 0.35 | SWIMS |
| Thomas Steel Strip | | 0.62 | 0.45 | 0.17 | SWIMS |
| RG Steel | | | | | |
| | 003 | 0.086 | 0.98 | 0.37 | SWIMS |
| | 006 | 0.013 | 1.56 | 0.59 | SWIMS |
| | 007 | 2.48[C] | 0.30 | 0.11 | SWIMS |
| | 008 | 6.91 | 0.17 | 0.07 | SWIMS |
| | Intake[B] | --.-- | --.-- | --.-- | --- |
| | 013 | 34.3 | 0.11 | 0.04 | SWIMS |
| | 010 | 0.24 | 0.72 | 0.27 | SWIMS |
| | 011 | 1.47 | 0.60 | 0.23 | SWIMS |
| | 012 | 0.14 | 0.47 | 0.18 | SWIMS |
| ArcelorMittal | 014 | 2.58 | 0.44 | 0.17 | SWIMS |
| Warren WWTP | | 14.9 | 0.49 | 0.19 | SWIMS |
| RMI - Niles | | 0.35 | 0.51 | 0.19 | SWIMS |
| GenOn Power | | | | | |
| | 002 | 2.7 | 0.43 | 0.16 | SWIMS |
| | 008 | 0.001 | 0.0 | 0.0 | SWIMS |
| | 009 | 1.0 | 0.0 | 0.0 | |
| Niles WWTP | | 4.99 | 0.52 | 0.20 | SWIMS |
| McDonald Steel | 0.91 | 0.97 | 0.37 | SWIMS | |
| Youngstown WWTP | | 34.6 | 0.39 | 0.15 | SWIMS |
| Campbell WWTP | 2.1 | 0.55 | 0.21 | SWIMS | |
| Struthers WWTP | 4.7 | 0.31 | 0.12 | SWIMS | |
| Lowellville WWTP | | 0.43 | 0.72 | 0.27 | SWIMS |

[A] Each iteration of the model sequentially selects an upstream flow from the historical flow record at this gage.
[B] Intake flow was set equal to the sum of the RG Steel effluent flows plus the Mittal flow, multiplied by 0.871. (12.9 percent of the RG Steel / Mittal flow comes from sources other than the intake.)
[C] Long-term average value reported on the application.

**Table 7. Water Quality Criteria in the Study Area**

| | | Outside Mixing Zone Criteria | | | | |
|---|---|---|---|---|---|---|
| | | Average | | | Maximum | Inside Mixing |
| Parameter | Units | Human Health | Agri-culture | Aquatic Life | Aquatic Life | Zone Maximum |
| Ammonia - S | mg/L | -- | -- | 1.3 | -- | -- |
| Ammonia – W | mg/L | -- | -- | 4.0 | -- | -- |
| Antimony | µg/L | 4300. | -- | 190. | 900. | 1800. |
| Arsenic | µg/L | -- | 100. | 150. | 340. | 680. |
| Barium | µg/L | -- | -- | 220. | 2000. | 4000. |
| Beryllium [H] | µg/L | 280. | 100. | 25. | 220. | 480. |
| Bis(2-ethylhexyl)phthalate | µg/L | 59. | -- | 8.4 | 1100. | 2100. |
| Boron | µg/L | -- | -- | 3900. | 33000. | 65000. |
| Bromodichloromethane | µg/L | 460. | -- | -- | -- | -- |
| Bromoform | µg/L | 3600. | -- | 230. | 1100. | 2200. |
| Bromomethane | µg/L | 4000. | -- | 16. | 38. | 75. |
| Chlorine, tot. res. | µg/L | -- | -- | 11. | 19. | 38. |
| Chloroform | µg/L | 4700. | -- | 140. | 1300. | 2600. |
| Chromium $^{+6}$, diss. | µg/L | -- | -- | 10. [C] | 16. | 31. |
| Cobalt | µg/L | -- | -- | 24. | 220. | 440. |
| Cyanide, free | µg/L | 220000. | -- | 12. | 46. | 92. |
| Dibromochloromethane | µg/L | 340. | -- | -- | -- | -- |
| Fluoride | µg/L | -- | 2000. | -- | -- | -- |
| Iron | µg/L | -- | 5000. | 1500. [C] | -- | -- |
| Mercury [A] | ng/L | 12. | 10000. | 910. | 1700. | 3400. |
| Methyl Bromide | µg/L | 4000. | -- | 16. | 38. | 75. |
| Methylene Chloride | µg/L | 16000. | -- | 1900. | 11000. | 22000. |
| Molybdenum | µg/L | -- | -- | 20000. | 190000. | 370000. |
| Naphthalene | µg/L | -- | -- | 21. | 170. | 340. |
| Nitrate+Nitrite | mg/L | -- | 100. | -- | -- | -- |
| Phenol | µg/L | 4600000. | -- | 400. | 4700. | 9400. |
| Selenium | µg/L | 11000. | 50. | 4.6 [C] | -- | -- |
| Silver | µg/L | _ | _ | 1.3 | 24. [D] | 49. [D] |
| Strontium | µg/L | -- | -- | 21000. | 40000. | 81000. |
| Tetrachloroethylene | µg/L | 89. | -- | 53. | 430. | 850. |
| Thallium | µg/L | 6.3 | -- | 17. | 79. | 160. |
| Tin | µg/L | -- | -- | 180. | 1600. | 3200. |
| Toluene | µg/L | 200000. | -- | 62. | 560. | 1100. |
| Total Dissolved Solids | mg/L | -- | -- | 1500. | -- | -- |
| Total Dissolved Solids | mg/L | -- | -- | 500. [C] | -- | -- |

[A] Bioaccumulative Chemical of Concern (BCC)
[C] Pennsylvania Water Quality Criteria.
[D] Effective Criteria Based on Application of Dissolved Metal Translator.
[H] Aquatic Life Criteria Based on hardness of 169.mg/l. IMZM based on hardness of 180. mg/l.

**Table 8. Instream Conditions and Discharger Flows for the CONSWLA Model**

| Parameter | Units/Outfall | | Value | Basis |
|---|---|---|---|---|
| Mahoning River Upstream | | | | |
| 7Q10 | cfs | annual | 136. | USGS gage #03094000, 1969-2010 data |
| 1Q10 | cfs | annual | 129. | USGS gage #03094000, 1969-2010 data |
| 30Q10 | cfs | summer | 186. | USGS gage #03094000, 1969-2010 data |
| | cfs | winter | 192. | USGS gage #03094000, 1969-2010 data |
| HMQ | cfs | annual | 383. | USGS gage #03094000, 1969-2010 data |
| Meander Creek at mouth | | | | |
| 7Q10 | cfs | annual | 6.19 | USGS gage #03097500, 1929-51 data |
| 1Q10 | cfs | annual | 6.19 | USGS gage #03097500, 1929-51 data |
| 30Q10 | cfs | summer | 6.19 | USGS gage #03097500, 1929-51 data |
| | cfs | winter | 6.19 | USGS gage #03097500, 1929-51 data |
| HMQ | cfs | annual | 6.19 | USGS gage #03097500, 1929-51 data |
| Mosquito Creek at mouth | | | | |
| 7Q10 | cfs | annual | 10.6 | USGS gage #03095500, 1954-91 data |
| 1Q10 | cfs | annual | 9.47 | USGS gage #03095500, 1954-91 data |
| 30Q10 | cfs | summer | 14.0 | USGS gage #03095500, 1954-91 data |
| | cfs | winter | 12.6 | USGS gage #03095500, 1954-91 data |
| HMQ | cfs | annual | 28.0 | USGS gage #03095500, 1954-91 data |
| Mill Creek at mouth | | | | |
| 7Q10 | cfs | annual | 9.99 | USGS gage #03098500, 1952-71 data |
| 1Q10 | cfs | annual | 9.87 | USGS gage #03098500, 1952-71 data |
| 30Q10 | cfs | summer | 10.7 | USGS gage #03098500, 1952-71 data |
| | cfs | winter | 15.7 | USGS gage #03098500, 1952-71 data |
| HMQ | cfs | annual | 14.3 | USGS gage #03098500, 1952-71 data |
| Discharger Flow (cfs) | | | | |
| Warren Steel Holdings | 005 | | 2.01 | DSW Permits Staff |
| Thomas Steel Strip | 001 | | 1.83 | DSW Permits Staff |
| RG Steel Warren | 003 | | 0.34 | DSW Permits Staff |
| | 006 | | 0.08 | DSW Permits Staff |
| | 007 | | 3.84 | DSW Permits Staff |
| | 008 | | 13.4 | DSW Permits Staff |
| | 010 | | 0.77 | DSW Permits Staff |
| | 011 | | 4.56 | DSW Permits Staff |
| | 012 | | 0.38 | DSW Permits Staff |
| | 013 | | 57.6 | DSW Permits Staff |
| ArcelorMittal Warren | 014 | | 6.50 | DSW Permits Staff |
| Warren WWTP | 001 | | 24.8 | DSW Permits Staff |
| RMI-Niles | 001 | | 0.743 | DSW Permits Staff |
| Niles WWTP | 001 | | 9.59 | DSW Permits Staff |
| McDonald Steel | 001 | | 2.82 | DSW Permits Staff |
| Mosquito Creek WWTP | 001 | | 6.50 | DSW Permits Staff |
| Meander Creek WWTP | 001 | | 6.19 | DSW Permits Staff |
| Boardman WWTP | 001 | | 7.74 | DSW Permits Staff |

**Table 8. Instream Conditions and Discharger Flows for the CONSWLA Model (Continued)**

| Parameter | Units/Outfall | | Value | Basis |
|---|---|---|---|---|
| Discharger Flow | cfs | | | |
| GenOn Niles Power | 001 | | 264.6 | DSW Permits Staff |
| | 002 | | 6.92 | DSW Permits Staff |
| | 008 | | 0.002 | DSW Permits Staff |
| | 009 | | 3.09 | DSW Permits Staff |
| Girard WWTP | 001 | | 7.74 | DSW Permits Staff |
| Youngstown WWTP | 001 | | 54.2 | DSW Permits Staff |
| Campbell WWTP | 001 | | 2.94 | DSW Permits Staff |
| Struthers WWTP | 001 | | 9.28 | DSW Permits Staff |
| Lowellville WWTP | 001 | | 0.792 | DSW Permits Staff |
| Mixing Assumption | % | average | 100 | Stream-to-discharge ratio |
| | % | maximum | 100 | Stream-to-discharge ratio |
| Background Water Quality | | | | |
| Ammonia | mg/L | summer | 0.305 | Youngstown 801: 24 values,0<MDL, 2006-11 |
| Ammonia | mg/L | winter | 0.30 | Youngstown 801: 17 values,0<MDL, 2006-11 |
| Arsenic | µg/L | annual | 2.0 | STORET [C]; 38 values, 17<MDL, 2006-2011 |
| Beryllium | µg/L | annual | 0. | No representative data available. |
| Bis-2EHP | µg/L | annual | 0. | No representative data available. |
| Boron | µg/L | annual | 0. | No representative data available. |
| Bromomethane | µg/L | annual | 0. | No representative data available. |
| Cadmium | µg/L | annual | 0. | STORET [C]; 38 values, 38<MDL, 2006-2011 |
| Chlorine, total res | µg/L | annual | 0. | No representative data available. |
| Chromium, tot. | µg/L | annual | 1. | STORET [C]; 12 values, 11<MDL, 2006-2011 |
| Chromium$^{+6}$, diss | µg/L | annual | 0. | No representative data available. |
| Chloroform | µg/L | annual | 0. | No representative data available. |
| Cobalt | µg/L | annual | 0. | No representative data available. |
| Copper | µg/L | annual | 5. | STORET [C]; 38 values, 30<MDL, 2006-2011 |
| Cyanide free | µg/L | annual | 0. | No representative data available |
| Fluoride | µg/L | annual | 0. | No representative data available. |
| Iron | µg/L | annual | 719. | STORET [C]; 38 values, 0<MDL, 2006-2011 |
| Lead | µg/L | annual | 1. | STORET [C]; 38 values, 35<MDL, 2006-2011 |
| Molybdenum | µg/L | annual | 0. | No representative data available. |
| Naphthalene | µg/L | annual | 0. | No representative data available. |
| Nickel | µg/L | annual | 2.75 | STORET [C]; 12 values, 0<MDL, 2006-2011 |
| Nitrate+Nitrate | mg/L | annual | 0.61 | STORET [C]; 38 values, 0<MDL, 2006-2011 |
| Phenol | µg/L | annual | 0. | No representative data available. |
| Selenium | µg/L | annual | 0. | STORET [C]; 38 values, 38<MDL, 2006-2011 |
| Silver | µg/L | annual | 0. | No representative data available. |
| Strontium | µg/L | annual | 127. | STORET [C]; 38 values, 0<MDL, 2006-2011 |
| TDS | mg/L | annual | 252. | STORET [C]; 38 values, 0<MDL, 2006-2011 |
| Tetrachloroethylene | µg/L | annual | 0. | No representative data available. |
| Thallium | µg/L | annual | 0. | No representative data available. |
| Tin | µg/L | annual | 0. | No representative data available. |
| Zinc | µg/L | annual | 5 | STORET [C]; 38 values, 33<MDL, 2006-2011 |

[C] STORET station # 602280 Mahoning River @ Leavittsburg - Leavitt Rd. RM 45.51

**Table 9. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria**

| Parameter | Units | Average Human Health | Average Agri Supply | Maximum Aquatic Life | Inside Aquatic Life | Mixing Zone Maximum |
|---|---|---|---|---|---|---|
| Arsenic [B] | µg/L | – | 473. | 374. | 830.[A] | 680. |
| Barium | µg/L | – | – | 339. | 3174. | 4000. |
| Bromomethane | µg/L | 30140. [A] | – | 66. | 152. [A] | 75. |
| Cadmium | µg/L | – | – | 2.6 [E] | 23.[A] | 23. |
| Chromium, tot. [B] | µg/L | – | – | 1109. | 7100.[A] | 7100. |
| $Chromium^{+6}$, dissolved | µg/L | – | – | 25. [E] | 39.[A] | 31. |
| Copper | µg/L | – | – | 61.[D] | 61. [A D] | 61. |
| Cyanide free [B] | µg/L | 681400.[A] | – | 20. | 73. | 92. |
| Lead | µg/L | – | – | 31.[D, E] | 700. [A D] | 700. |
| Mercury [C] | ng/L | 12. | 10000.[A] | 910. | 1700. | 3400. |
| Molybdenum [B] | µg/L | – | – | 53730. | 497500.[A] | 370000. |
| Nickel [B] | µg/L | – | – | 448. | 1900.[A] | 1900. |
| Selenium [B] | µg/L | 52020. | 236. | 11.[E] | – | – |
| Silver | µg/L | – | – | 3.0 | 19.[D] | 49.[D] |
| Total Dissolved Solids | mg/L | – | – | 1949. | – | – |
| Total Dissolved Solids | mg/L | – | – | 622. [E] | – | – |
| Zinc | µg/L | -- | -- | 480. [A] | 480. [A] | 480. |

[A] Allocation must not exceed the Inside Mixing Zone Maximum.
[B] Parameter would not require a WLA based on reasonable potential procedures, but allocation requested for use in pretreatment program.
[C] Bioaccumulative Chemical of Concern (BCC); no mixing zone allowed after 11/15/2010, criteria must be met at end-of-pipe unless the requirements for an exception are met as listed in 3745-2-08.
[D] WLA based on applicable dissolved metal translator.
[E] Limit to meet Pennsylvania water quality criteria.

## Table 10. Parameter Assessment

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

| | |
|---|---|
| Chloride | Phosphorus |

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

| | | |
|---|---|---|
| Arsenic | Bromodichloromethane | Chlorine, total res. |
| Chloroform | Chromium, tot. | Cyanide, free |
| Iron | Molybdenum | Nickel |
| Nitrate+Nitrite | Selenium | Strontium |
| Tetrachloroethene | | |

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

| | | |
|---|---|---|
| Barium | Bromomethane | $Chromium^{+6}$, dis |
| Copper | Lead | 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 |
|---|---|---|---|---|
| Cadmium | µg/L | annual | 2.6 [E] | 23. |
| Mercury | ng/L | annual | 12. | 1700. |
| Total Dissolved Solids | mg/L | annual | 1949. | -- |
| Total Dissolved Solids | mg/L | annual | 622. [E] | -- |

[E] Limit to meet Pennsylvania water quality criteria.

**Table 11. Final Effluent Limits and Monitoring Requirements**

| | | Effluent Limitations | | | | |
|---|---|---|---|---|---|---|
| | | Concentration | | Loading (kg/day)[a] | | |
| Parameter | Units | Monthly Average | Daily Maximum | Monthly Average | Daily Maximum | Basis[b] |
| Temperature | $^oC$ | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | M |
| Dissolved Oxygen | mg/l | 5.0 minimum | | -- | -- | BEJ, EP |
| Suspended Solids | mg/l | 30 | 45[c] | 682 | 1022[c] | BEJ, BPT, EP |
| Oil and Grease | mg/l | -- | 10 | -- | -- | WQS, EP |
| Ammonia-N | mg/l | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | BEJ, EP |
| Total Kjeldahl-N | mg/l | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | M |
| Nitrite(N) + Nitrate(N) | mg/l | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | M |
| Phosphorus, Total | mg/l | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | M |
| Nickel, T. R. | µg/l | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | M |
| Zinc, T. R. | µg/l | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | M |
| Cadmium, T. R. | µg/l | 2.6 | 23 | 0.0591 | 0.523 | WLA |
| Lead, T. R. | µg/l | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | M |
| Chromium, T. R. | µg/l | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | M |
| Copper, T. R. | µg/l | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | M |
| Hex. Chromium (Dissolved) | µg/l | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | M |
| *E. coli* | | | | | | |
| Summer Only (Final) | #/100ml | 126 | 284[c] | -- | -- | WQS |
| Flow | MGD | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | M |
| Chlorine, Total Residual | | | | | | |
| Summer | mg/l | -- | 0.024 | -- | -- | EP |
| Mercury, T. | ng/l | | | | | |
| Interim | | 31 | 1700 | 0.000705 | 0.0387 | BEJ |
| Final | | 12 | 1700 | 0.000273 | 0.0387 | WLA |
| Whole Effluent Toxicity | | | | | | |
| Acute | TUa | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | WET |
| pH | S.U. | - - - - - - - - - - - 6.5 to 9.0 - - - - - - - - - - - | | | | WQS, EP |
| Total Filterable Residue (Dissolved Solids) | mg/l | - - - - - - - - - - - - Monitor - - - - - - - - - - - - - | | | | BEJ |
| $CBOD_5$ | mg/l | 25 | 40[c] | 568 | 909[c] | BEJ, BPT, EP |

[a] Effluent loadings based on average design discharge flow of 6.0 MGD.

[b] <u>Definitions:</u> BEJ = Best Engineering Judgment; BPT = Best Practicable Waste Treatment Technology, 40 CFR Part 133, Secondary Treatment Regulation; EP = Existing Permit; M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits [OAC 3745-33-07(A)]; WET = Minimum testing requirements for whole effluent toxicity [OAC 3745-33-07(B)(11]; WLA = Wasteload Allocation procedures (OAC 3745-2); WQS = Ohio Water Quality Standards (OAC 3745-1-07).

[c] Weekly average limit.