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As of June 2010, all permits having a fact sheet that are going through a modification will have posted in pdf format the modification fact sheet attached to the front of the previous renewal fact sheet.

FACT SHEETS ARE ON NEXT PAGE

If you have any questions regarding this, please contact the NPDES or PPU sections in the Division of Surface Water.

Attached are:

2PD00039*JD & KD

National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding a Modification to an NPDES Permit To Discharge to Waters of the State of Ohio
for the Upper Sandusky Wastewater Treatment Plant

Public Notice No.: 10-10-014
Public Notice Date: October 11, 2010
Comment Period Ends: November 9, 2010

OEPA Permit No.: 2PD00039*KD
Application No.: OH0020001

Name and Address of Applicant:

City of Upper Sandusky
119 North Seventh Street
Upper Sandusky, Ohio 43351

Name and Address of Facility Where
Discharge Occurs:

Upper Sandusky Wastewater Treatment Plant
155 Indian Mill Road
Upper Sandusky, Ohio

Receiving Water: Sandusky River

Subsequent
Stream Network: Sandusky Bay, Lake Erie

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.

In accordance with the antidegradation rule, OAC 3745-1-05, the Director has determined that a lowering of water quality in the Sandusky River is necessary. Provision (F)(2)(d) was applied to this application. 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.

Procedures for Participation in the Formulation of Final Determinations

The proposed modification is tentative but shall become final on the effective date unless (1) an adjudication hearing is requested, (2) the Director withdraws and revises the proposed modification after consideration of the record of a public meeting or written comments, or (3) upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty (30) days of publication of this notice, any person may submit written comments, a statement as to why the proposed modification should be changed, a request for a public meeting on the proposed modification and/or a request for notice of further actions concerning the modification. All

communications timely received will be considered in the final formulation of the modification. If significant public interest is shown a public meeting will be held prior to finalization of the modification.

Within thirty (30) days of the issuance of the proposed modification any officer of an agency of the state or of a political subdivision, acting in his representative capacity or any person aggrieved or adversely affected by issuance of it may request an adjudication hearing by submitting a written objection in accordance with Ohio Revised Code Section 3745.07. Since all other conditions of the permit remain in effect, a hearing may not be requested on any issues other than the proposed modification. If an adjudication hearing is requested, the existing NPDES permit will remain in effect until the hearing is resolved. Following the finalization of the modification by the Director, any person who was a party to an adjudication hearing may appeal to the Environmental Review Appeals Commission.

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
Lazarus Government Center
P.O. Box 1049
Columbus, Ohio 43216-1049**

Interested persons are invited to submit written comments upon the proposed modification. 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
Lazarus Government Center
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 Jason Ko, (419) 373-3021, Jason.Ko@epa.ohio.gov .

Location of Discharge/Receiving Water Use Classification

The Upper Sandusky wastewater treatment plant discharges to the Sandusky River at River Mile (RM) 80.02. The approximate location of the facility is shown in Figure 1.

This segment of the Sandusky River is described by Ohio EPA River Code: 05-001, U.S. EPA River Reach #: 04100011-040, County: Wyandot, Ecoregion: Eastern Corn Belt Plains. The Sandusky River is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-12): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Class A Primary Contact Recreation (PCR).

Facility Description

The Upper Sandusky wastewater plant is an advanced treatment facility with an average daily design flow of 2.0 million gallons per day (MGD). Wet stream processes include influent pumping, bar screens, aerated grit removal, conventional activated sludge aeration, phosphorus removal by chemical addition, secondary clarification and ultra violet disinfection. Solid stream processes are primary and secondary aerobic digestion, dewatering using drying beds and sludge disposal at a landfill.

Upper Sandusky has a collection system that is approximately 60 percent combined sewers and 40 percent separate sanitary sewers. Over time, the City has eliminated the CSOs (combined sewer overflows) from its collection system, but it still has an active raw sewage bypass at the wastewater plant. The permit includes a compliance schedule that requires elimination of the bypass as soon as possible but no later than the expiration date of the permit, April 30, 2015.

Upper Sandusky does not implement an approved industrial pretreatment program. Based on information in its March 2009 NPDES renewal application, three categorical industrial users and one significant noncategorical industrial discharge approximately 35,000 gallons per day to the wastewater plant. Ohio EPA has issued indirect discharge permits to two facilities in Upper Sandusky:

Bridgestone APM Company – manufactures miscellaneous rubber to metal parts for the automotive industry, permit number 2DP00056; and

Guardian Automotive Products, Inc. – manufactures laminated windshields for the automotive industry, permit number 2DP00068.

Description of Existing Discharge

Table 1 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 2PD00039001. Data are presented for the period August 2005 through July 2010.

Basis of the Modification

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

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the Ohio Administrative Code. As a result, Ohio EPA is proposing a modification to the NPDES permit. Mercury variance provisions are being added as Items X, Y and Z in Part II of the NPDES permit. The following requirements have been included in the draft modification:

- A variance-based monthly average effluent limit of 16.1 ng/l, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee make reasonable progress to meet the water-quality-based effluent limit for mercury by implementing the plan of study, which has been developed as part of the Pollutant Minimization Program (PMP);
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/l as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average water quality based effluent limit for mercury has not been achieved.

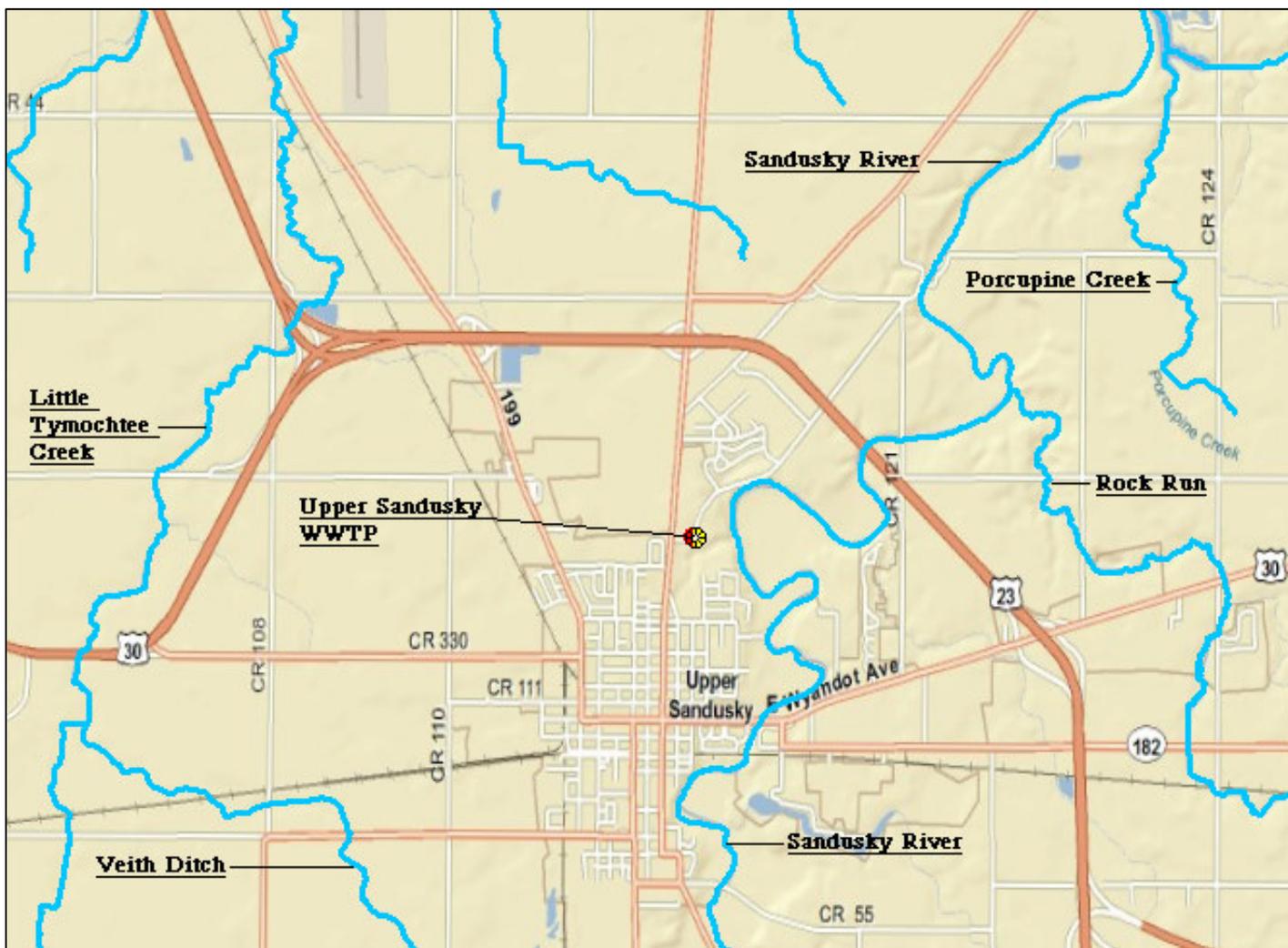


Figure 1. Location of the Upper Sandusky wastewater treatment plant.

Table 1. Effluent Characterization Using Self-Monitoring Data

Summary of unaltered discharge monitoring report data for Upper Sandusky outfall 2PD00039001 (August 2005 – July 2010). All values are based on annual records unless otherwise indicated.

Parameter	Season	Units	# Obs.	Percentiles		Data Range
				50 th	95 th	
Water Temperature	Annual	C	1255	15	22	5-24
Dissolved Oxygen	Summer	mg/l	638	8.3	9.3	6.7-9.7
Dissolved Oxygen	Winter	mg/l	617	9.6	10.8	7.9-12.5
pH, Maximum	Annual	S.U.	1192	7.1	7.4	5.9-7.6
pH, Minimum	Annual	S.U.	1192	7	7.3	5.7-7.5
Residue, Total Dissolved	Annual	mg/l	18	616	714	353-724
Total Suspended Solids	Annual	mg/l	727	5	17	0-102
Oil and Grease, Hexane	Annual	mg/l	125	2	8	0-48
Nitrogen, Ammonia (NH3)	Summer	mg/l	369	0.16	3.58	0-16.7
Nitrogen, Ammonia (NH3)	Winter	mg/l	360	0.18	1.39	0-5.89
Nitrite Plus Nitrate, Total	Annual	mg/l	60	6.37	13.2	0.49-15
Phosphorus, Total (P)	Annual	mg/l	317	0.637	1.95	0.163-9.09
Cyanide, Free	Annual	mg/l	20	0	0	0-0
Barium, Total Recoverable	Annual	ug/l	22	170	259	11-341
Nickel, Total Recoverable	Annual	ug/l	20	0	23.2	0-26
Strontium, Total Recoverable	Annual	ug/l	19	1760	3910	635-4270
Zinc, Total Recoverable	Annual	ug/l	20	49.5	148	12-168
Cadmium, Total Recoverable	Annual	ug/l	20	0	0.9	0-18
Lead, Total Recoverable	Annual	ug/l	20	0	0	0-0
Chromium, Total Recoverable	Annual	ug/l	20	0	0	0-0
Copper, Total Recoverable	Annual	ug/l	58	3	16.2	0-21
Chromium, Dissolved Hexavalent	Annual	ug/l	20	0	0	0-0
Fecal Coliform	Annual	#/100 ml	369	1	220	1-62100
E. coli	Annual	#/100 ml	36	1	1	1-1
Bis(2-ethylhexyl) Phthalate	Annual	ug/l	20	0	16.2	0-22.4
Flow Rate	Summer	MGD	919	1.29	2.83	0.612-3.64
Flow Rate	Winter	MGD	906	1.62	3.17	0.616-3.73
Flow Rate	Annual	MGD	1825	1.43	2.99	0.612-3.73
Mercury, Total (Low Level)	Annual	ng/l	56	6.1	16.4	0-34.2
Mercury, Total (Low Level)	Annual	ng/l	3	5.5	8.92	5.1-9.3
pH, Maximum	Annual	S.U.	63	7.4	7.6	7.1-7.7
pH, Minimum	Annual	S.U.	63	7.3	7.5	6.9-7.6
CBOD 5 day	Summer	mg/l	365	2	5.8	0-28.8
CBOD 5 day	Winter	mg/l	358	2.3	4.33	0-8.8

Table 2. Modified final effluent limits and monitoring requirements for Upper Sandusky outfall 2PD00039001 and the basis for their recommendation.

Parameter	Units	Effluent Limits				Basis ^b
		Concentration		Loading (kg/day) ^a		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Mercury, T.	ng/l	16.1	1700 ^c	0.000122	0.0129 ^c	VAR

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

^b Definitions: VAR = General mercury variance, Rule 3745-33-07(D)(10) of the Ohio Administrative Code

^c No change from current permit.

National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

(Revised 4/6/10)

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for the Upper Sandusky Wastewater Treatment Plant

Public Notice No.: 09-12-040
Public Notice Date: December 30, 2009
Comment Period Ends: January 29, 2010

OEPA Permit No.: 2PD00039*JD
Application No.: OH0020001

Name and Address of Applicant:

City of Upper Sandusky
119 North Seventh Street
Upper Sandusky, Ohio 43351

Name and Address of Facility Where
Discharge Occurs:

Upper Sandusky Wastewater Treatment Plant
155 Indian Mill Road
Upper Sandusky, Ohio

Receiving Water: Sandusky River

Subsequent
Stream Network: Sandusky Bay, Lake Erie

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 final effluent monitoring and limits proposed for the following parameters are the same as in the existing permit: flow, temperature, dissolved oxygen, CBOD₅, total suspended solids, ammonia-nitrogen, oil and grease, pH, fecal coliform, total phosphorus, nitrate+nitrite-nitrogen, free cyanide, cadmium, total chromium, dissolved hexavalent chromium, lead, nickel and zinc.

A special condition is continued from the existing permit that requires the Upper Sandusky treatment plant to comply with the total phosphorus wasteload allocation established in the *Total Maximum Daily Loads for the Upper Sandusky River Watershed, Final Report* (Ohio EPA; approved by U.S. EPA, September 29, 2004).

New effluent limits are proposed for barium. A three year interim period requiring only monitoring is proposed to give the City the opportunity to investigate potential sources of barium, to revise its local industrial user limits if necessary, and to work with Ohio EPA if revisions are necessary in the indirect discharge permits the Agency has issued to two Upper Sandusky industrial users

New water quality based effluent limits are proposed for mercury. Mixing zones for mercury are not allowed beginning in November 2010. At that time, all mercury limits are set equal to water quality standards, a monthly average of 1.3 ng/l in the Lake Erie basin.

The interim limits, which last until October 31, 2010, are slightly higher than the final limits because they allow for dilution based on critical, upstream low flows. Since Upper Sandusky may have difficulty complying with the final monthly average limit for mercury and because cost effective measures for reducing mercury discharge concentrations may not be available, a compliance schedule for mercury has been included in the draft permit.

The compliance schedule gives Upper Sandusky the opportunity to evaluate its compliance options and to decide if it will request a variance from the mercury standards. The City must make this determination and submit a mercury variance application (if needed) no later than 4 months after the effective date of the permit.

Current permit limits for copper are being removed because effluent data shows that they no longer have the reasonable potential to contribute to exceedances of water quality standards. Continued monitoring is proposed.

Monitoring, instead of effluent limits, is proposed for bis(2-ethylhexyl)phthalate (BEHP). The City detects BEHP intermittently. It has surveyed its industrial users and did not identify a known, concentrated source. A special condition is proposed for the City to collect manual composite samples in glass to eliminate the potential for sample contamination.

Annual chronic toxicity testing with the determination of acute endpoints is proposed for the life of the permit to adequately characterize the effluent and fulfill federal NPDES application requirements.

Current monitoring requirements for total dissolved solids and strontium are being removed from the permit because effluent data show that they do not pose an environmental hazard.

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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 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 Gary Stuhlfauth, (614) 644-2026, gary.stuhlfauth@epa.state.oh.us.

Location of Discharge/Receiving Water Use Classification

The Upper Sandusky wastewater treatment plant discharges to the Sandusky River at River Mile (RM) 80.02. The approximate location of the facility is shown in Figure 1.

This segment of the Sandusky River is described by Ohio EPA River Code: 05-001, U.S. EPA River Reach #: 04100011-040, County: Wyandot, Ecoregion: Eastern Corn Belt Plains. The Sandusky River is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-12): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and 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 Upper Sandusky wastewater plant is an advanced treatment facility with an average daily design flow of 2.0 million gallons per day (MGD). The plant was expanded from 1.5 MGD to its current capacity in 1996. Wet stream processes include influent pumping, bar screens, aerated grit removal, conventional activated sludge aeration, phosphorus removal by chemical addition, secondary clarification and ultra violet disinfection. Solid stream processes are primary and secondary aerobic digestion, dewatering using drying beds and sludge disposal at a landfill.

Upper Sandusky has a collection system that is approximately 60 percent combined sewers and 40 percent separate sanitary sewers. Over time, the City has eliminated the CSOs (combined sewer overflows) from its collection system, but it still has an active raw sewage bypass at the wastewater plant.

In May 2008, Ohio EPA approved Permit-To-Install (PTI) number 653410, which is for plant upgrades to eliminate the raw bypass. The upgrades will consist of converting existing sludge handling facilities to two aeration tanks and a final settling tank providing 500,000 gallons per day storm-mode operating capacity. Effluent from the wet weather treatment train will recombine with secondary treatment effluent prior to disinfection. The City currently is waiting for approval through the state's revolving loan fund to finance the \$266,360 project. A compliance schedule will be included in the renewal permit to complete this project and eliminate the bypass no later than January 1, 2012.

Upper Sandusky does not implement an approved industrial pretreatment program. Based on information in its March 2009 NPDES renewal application, three categorical industrial users and one significant noncategorical industrial discharge approximately 35,000 gallons per day to the wastewater plant. Ohio EPA has issued indirect discharge permits to two facilities in Upper Sandusky:

Bridgestone APM Company – manufactures miscellaneous rubber to metal parts for the automotive industry, permit number 2DP00056; and

Guardian Automotive Products, Inc. – manufactures laminated windshields for the automotive industry, permit number 2DP00068.

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 2PD00039001. Data are presented for the period June 2004 through May 2009, 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 screening 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

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 Water Quality Standards 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 Water Quality Standards (WQS; Ohio Administrative Code 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. An aquatic life use attainment table is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (i.e., full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and comments and observations for each sampling location.

The results of the most recent Ohio EPA water quality survey of the Sandusky River in the vicinity of Upper Sandusky are included in the report, *Biological and Water Quality Study of Sandusky River and Selected Tributaries, 2001* (Ohio EPA; May 21, 2003). The entire report is available at the following Ohio EPA Internet site: <http://www.epa.state.oh.us/dsw/documents/2001SanduskyTSD.pdf>.

Figure 2 is the aquatic life use attainment table from that report for the mainstem of the Sandusky River upstream and downstream of Upper Sandusky (RM 80). It shows that the river is in full attainment upstream and downstream of the Upper Sandusky plant.

Figure 3 is a summary table of the aquatic life attainment status from the same report. It provides information on the causes and sources of impairment within the assessment unit that includes Upper Sandusky.

Total Phosphorus and TMDL (Total Maximum Daily Loads) Compliance

The existing permit for the Upper Sandusky treatment plant included a special condition to comply with the total phosphorus wasteload allocation established in the *Total Maximum Daily Loads for the Upper Sandusky River Watershed, Final Report* (Ohio EPA; approved by U.S. EPA, September 29, 2004). For the Upper Sandusky plant, the TMDL established an allowable total phosphorus load of 5.3 kg/day, which was expressed as:

$$5.3 \text{ kg/day total phosphorus} = \text{med } Q_{\text{eff}} \times \text{med } P_{\text{eff}} \times F$$

where:

med Q_{eff} = 5-year median daily effluent flow rate (MGD). This flow value is the median of the daily flows at station number 2PD00039001 for the previous 5 consecutive calendar years;

med P_{eff} = median daily effluent total phosphorus concentration during January - December (mg/l); and

F = conversion factor, 3.7854.

Table 5 presents the median phosphorus concentrations, the 5-year median flows and the calculated total phosphorus load for the years 2005 through 2008. The loads range from 2.73 – 5.18 kg/day, and they are in compliance with the 5.3 kg/day allowable total phosphorus load.

The complete TMDL report is available at the following Ohio EPA Internet site:

<http://www.epa.state.oh.us/dsw/tmdl/SanduskyRiverUpperTMDL.html> .

Development of Water-Quality-Based Effluent Limits

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

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

Self-monitoring data (DMR)	June 2004 through May 2009
Ohio EPA compliance sampling data	2007

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

The PEQ values are used according to Ohio rules to compare to applicable 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 9 for a summary of the screening results.

Wasteload Allocation For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio Water Quality Standards (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. 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.

The applicable waterbody uses for this facility’s discharge and the associated stream design flows are as follows:

Aquatic life (WWH)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer 30Q10
		Winter 30Q10
Wildlife		Annual 90Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 7, and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

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

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

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. For Upper Sandusky, the wasteload allocation values are 0.4 TU_a and 1.14 TU_c.

The chronic toxicity unit (TU_c) is defined as 100 divided by the IC₂₅:

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

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

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

The acute toxicity unit (TU_a) is defined as 100 divided by the LC₅₀ for the most sensitive test species:

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

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

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

<u>Dilution Ratio</u> <u>(downstream flow to discharger flow)</u>	<u>Allowable Effluent Toxicity</u> <u>(percent effects in 100% effluent)</u>
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 wasteload allocation for Upper Sandusky is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1.4 to 1.

Reasonable Potential/ Effluent Limits/Hazard Management Decisions

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 8. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 3, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [(PEQ_{avg} ÷ PEL_{avg}) X 100, or (PEQ_{max} ÷ PEL_{max}) X 100], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 9.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 10 presents the final effluent limits and monitoring requirements proposed for Upper Sandusky outfall 2PD00039001 and the basis for their recommendation.

Based on best engineering judgment, the limits proposed for dissolved oxygen, CBOD₅ (5-day carbonaceous biochemical oxygen demand), total suspended solids and ammonia-nitrogen are a continuation of the existing permit limits. The summer ammonia-N limits were evaluated as part of the current wasteload allocation and are protective of the water quality standard for ammonia toxicity. Considering that the winter wasteload allocation for ammonia-N is 28 mg/l (Table 8) and the average winter PEQ value is 0.35 mg/l (Table 3), monitoring with no limits is appropriate during the winter months.

Limits proposed for oil and grease, pH, and fecal coliform are based on Water Quality Standards (OAC 3745-1-07). Phosphorus is limited based on provisions of OAC 3745-33-06(C). These are all a continuation of existing permit limits.

A special condition is proposed in Part II, Item T that that requires the Upper Sandusky treatment plant to comply with the total phosphorus wasteload allocation established in the *Total Maximum Daily Loads for the Upper Sandusky River Watershed, Final Report* (Ohio EPA; approved by U.S. EPA, September 29, 2004). This special condition was discussed previously in this fact sheet and is a continuation of an existing permit condition.

The Ohio EPA risk assessment (Table 9) places barium 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 50 percent of the wasteload allocation. Pollutants that meet this requirement must have permit limits under OAC Rule 3745-33-07(A)(1).

The limits proposed for barium are based on the wasteload allocation (Table 8). While much of the barium data reported by the City since December 2004 (n = 18) is lower than the proposed monthly average limit of 241 ug/l, the data are variable and on two occasions in 2006, the City reported values greater than 241 ug/l. A three year interim period requiring only monitoring is proposed. This will give the City the opportunity to investigate potential sources of barium, to revise its local industrial user limits if necessary, and to work with Ohio EPA if revisions are necessary in the indirect discharge permits the Agency has issued to two Upper Sandusky industrial users.

Ohio's water quality standard implementation rules [OAC 3745-2-05(A)(2)(d)(iv)] require a phase out of mixing zones for bioaccumulative chemicals of concern (BCCs) as of November 15, 2010. This rule applies 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 (1.3 ng/l in the Lake Erie basin; 12 ng/l in the Ohio River basin).

An interim table is proposed lasting until October 31, 2010 that includes mercury limits based on a wasteload allocation that allows for dilution based on critical, upstream low flows as specified in section 3745-2-05 of the Ohio Administrative Code (Table 8).

Beginning on November 1, 2010, a final table becomes effective that includes limits for mercury that are equal to the water quality standards (Tables 6 and 8). Since the Upper Sandusky wastewater plant may have difficulty complying with the final monthly average limit for mercury and because cost effective measures for reducing mercury discharge concentrations may not be available, a compliance schedule for mercury has been included in the draft permit.

The compliance schedule requires low level monitoring using Method 1631 and provides interim and final quantification levels. It also requires the permit holder to inform Ohio EPA that it can meet the final mercury limits, that it requests a compliance schedule to meet the final limits, or that it requests a variance from the mercury standards.

If the permittee believes that complying with the WQBELs is not possible, they may request a variance from the water quality standard. Ohio EPA would then review the variance application, and if approved, would proceed to modify the permit to incorporate variance-based mercury limits and conditions associated with the mercury variance.

Upper Sandusky is required to make the determination described above and submit a mercury variance application and NPDES permit modification request (if needed) no later than 4 months after the effective date of the permit. If the City does not apply for a mercury variance, water quality-based limits for mercury will become effective in November 2010. In this case, Ohio EPA will modify the permit change the reporting code for mercury in the interim table for outfall 001 to 50092. A quantification level of 0.5 ng/l will then apply to the low level mercury data submitted by the City.

The Ohio EPA risk assessment (Table 9) places bis(2-ethylhexyl)phthalate (BEHP) 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. However, based on best engineering judgment, continued monitoring with no limits is proposed. The reasons for this are as follows:

- The City detects BEHP intermittently. From June 2004 through March 2009, it was detected in 7 of 20 samples.
- The lab used by the City reports an MDL (method detection limit) for BEHP of 1.0 ug/l (current). The wasteload allocation value is 9.5 ug/l.
- In 2006, the City conducted a survey of its industrial users. It reported that none of them utilize BEHP. There is no known concentrated source to control.
- One of its industrial users does report BEHP detections in its TTO (total toxic organics) screening in the range 10 – 20 ug/l. This industry accounts for, on average, approximately 3 percent of the plants daily flow.

A special condition is proposed in Part II of the permit that requires effluent sampling for BEHP be conducted using manual composite samples collected in glass. This is to eliminate the potential for contamination from plastic sampling apparatus and containers.

Ohio EPA risk assessment (Table 9) places free cyanide, cadmium, total chromium, dissolved hexavalent chromium, copper, lead, nickel zinc and nitrate+nitrite-nitrogen 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. Low frequency 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

Based on best engineering judgment and the provisions of 40 CFR Part 132, Appendix F, Procedure 6, annual chronic toxicity testing with the determination of acute endpoints is proposed for the life of the permit. While the acute screening tests conducted by Ohio EPA during 2007 (see Table 4) do not show evidence of toxicity, two tests conducted two months apart over a five year period do not adequately characterize the Upper Sandusky discharge with respect to toxicity. The proposed monitoring will provide four tests conducted over the term of the permit and will provide data that is consistent with the NPDES application requirements at 40 CFR 122.21.

Other Requirements

Schedule of Compliance

A compliance schedule is proposed for the City to complete plant upgrades to eliminate the plant's raw sewage bypass no later than January 1, 2012. The work is being done under approved PTI number 653410. The proposed schedule includes interim milestones for completing construction no later than July 1, 2011. If post construction monitoring shows that bypasses continue, the compliance schedule includes a reopener clause for a modification of the NPDES permit to require a no feasible alternatives analysis to evaluate additional measures to eliminate the plant bypass.

Sanitary Sewer Overflow Reporting

Provisions for reporting sanitary sewer overflows (SSOs) are also 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 Upper Sandusky plant to have a Class III wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001.

Operator of Record

In December 2006, Ohio Administrative Code rule revisions became effective which 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.

Storm Water Compliance

Parts IV, V, and VI have been included with the draft permit to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, Upper Sandusky may submit a "No Exposure Certification" or seek coverage under the general permit for industrial storm water (permit # OHR000004).

The City previously had coverage under the "No Exposure Certification" beginning on October 30, 2003. However, this certification must be renewed every five years, and the City did not do this in 2008.

Parts IV, V, and VI will be removed from the final permit if: 1) Upper Sandusky submits a No Exposure Certification or submits a Notice of Intent (NOI) for coverage under the general permit for industrial storm water, 2) Ohio EPA determines that the facility meets the requirements for a No Exposure Certification or is eligible for coverage under the general permit, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

Outfall Signage

Part II of the permit includes requirements for signs to be placed at each outfall to the Sandusky River providing information about the discharge. Signage at outfalls is required pursuant to Ohio Administrative Code 3745-33-08(A).



Figure 1. Approximate location of the Upper Sandusky wastewater treatment plant.

Table 1. Effluent Characterization Using Ohio EPA Data

Summary of analytical results for Upper Sandusky outfall 2PD00039001. Units ug/l unless otherwise noted; OEPA = data from analyses by Ohio EPA.

PARAMETER	OEPA 10/30/07	OEPA 10/02/07
Dissolved solids, total (mg/l)	532	470
Lead	5.2	2.0
Iron	835	549
Strontium	1500	1290
Zinc	81	42
Chloroform	1.11	1.28

Table 2. Effluent Characterization Using Self-Monitoring Data

Summary of current permit limits and unaltered discharge monitoring report data for Upper Sandusky outfall 2PD00039001 (June 2004 – May 2009). 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		50 th	95 th	
Water Temperature	Annual	C	Monitor		1234	15	22	5-24
Dissolved Oxygen	Summer	mg/l		5.25 min	617	8.2	7.8**	6.6-9.7
Dissolved Oxygen	Winter	mg/l		5.25 min	617	9.6	8.6**	7.8-12.5
pH, Maximum	Annual	S.U.		9.0	1234	7.1	7.4	5.9-7.7
pH, Minimum	Annual	S.U.		6.5	1234	6.6*	7.3	5.7-7.4
Residue, Total Dissolved	Annual	mg/l	Monitor		17	628	724	432-724
Total Suspended Solids	Annual	mg/l	18	27 ^a	728	6	19	0-102
Oil and Grease, Hexane	Annual	mg/l		10	113	3	8	0-48
Nitrogen, Ammonia (NH3)	Summer	mg/l	1.75	2.62 ^a	363	0.15	4.43	0-16.7
Nitrogen, Ammonia (NH3)	Winter	mg/l	Monitor		362	0.16	1.47	0-5.89
Nitrite Plus Nitrate, Total	Annual	mg/l	Monitor		59	6.52	13.2	0-15
Phosphorus, Total (P)	Annual	mg/l	1.0	1.5 ^a	295	0.656	1.86	0.04-9.09
Cyanide, Free	Annual	mg/l	Monitor		18	0	0	0-0
Barium, Total Recoverable	Annual	ug/l	Monitor		18	89.5	257	0-341
Nickel, Total Recoverable	Annual	ug/l	Monitor		18	0	25.9	0-42
Strontium, Total Recoverable	Annual	ug/l	Monitor		18	1840	3220	635-4270
Zinc, Total Recoverable	Annual	ug/l	Monitor		24	39	143	11-168
Cadmium, Total Recoverable	Annual	ug/l	Monitor		18	0	0	0-0
Lead, Total Recoverable	Annual	ug/l	Monitor		18	0	0	0-0
Chromium, Total Recoverable	Annual	ug/l	Monitor		20	0	0	0-0
Copper, Total Recoverable	Annual	ug/l	30	62	52	3	15.5	0-21
Chromium, Dissolved Hexavalent	Annual	ug/l	Monitor		24	0	0	0-0
Fecal Coliform	Annual	#/100 ml	1000	2000 ^a	365	1	92	1-62100
Bis(2-ethylhexyl) Phthalate	Annual	ug/l	Monitor		20	0	16.2	0-22.4
Flow Rate	Summer	MGD	Monitor		889	1.3	2.75	0.762-3.64
Flow Rate	Winter	MGD	Monitor		906	1.76	3.3	0.715-3.73
Flow Rate	Annual	MGD	Monitor		1795	1.49	3.11	0.715-3.73
Mercury, Total (Low Level)	Annual	ng/l	Monitor		52	5.35	15.6	0-34.2
CBOD 5 day	Summer	mg/l	10	15 ^a	361	2.5	6.3	0-28.8
CBOD 5 day	Winter	mg/l	10	15 ^a	363	2.5	4.89	0-10.3
Nickel, Total Recoverable	Annual	ug/l	Monitor		2	0	0	0-0
Lead, Total Recoverable	Annual	ug/l	Monitor		6	0	0	0-0
Copper, Total Recoverable	Annual	ug/l	30	62	6	0	9.75	0-13
Cadmium, Total Recoverable	Annual	ug/l	Monitor		6	0	0	0-0
Cyanide, Free	Annual	mg/l	Monitor		6	0	0	0-0

Table 3. Effluent Data for the Upper Sandusky Wastewater Treatment Plant

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Ammonia-S	mg/l	252	169	1.22	2.18
Ammonia-W	mg/l	176	122	0.35	0.74
Barium	ug/l	18	17	348.502	477.4
Bis(2-ethylhexyl)phthalate	ug/l	20	7	22.8928	31.36
Cadmium - TR	ug/l	24	0	--	--
Chloroform	ug/l	2	2	3.55072	4.864
Chromium - TR	ug/l	20	0	--	--
Chromium VI - Diss	ug/l	24	0	--	--
Copper - TR	ug/l	58	31	15.33	21
Cyanide - free	mg/l	24	0	--	--
Dissolved solids	mg/l	19	19	730	866
Iron - TR	ug/l	2	2	2316.29	3173
Lead - TR	ug/l	26	2	4.9348	6.76
Mercury – TR	ng/l	52	47	20.4	32.3
Nickel - TR	ug/l	20	4	42.924	58.8
Nitrate-N + Nitrite-N	mg/l	59	58	10.9427	14.99
Strontium	ug/l	18	18	3322	5224
Zinc - TR	ug/l	26	26	124	208

Table 4. Summary of Acute Toxicity Test Results on the Upper Sandusky Wastewater Treatment Plant Effluent.

Test Date(a)	<i>Ceriodaphnia dubia</i> 48 hours								<i>Fathead Minnows</i> 48 hours							
	UP ^b	C ^c	LC ₅₀ ^d	EC ₅₀ ^e	%A ^f	%M ^g	TUa ^h	NF ⁱ	UP ^b	C ^c	LC ₅₀ ^d	EC ₅₀ ^e	%A ^f	%M ^g	TUa ^h	NF ⁱ
10/30 and 31/07*	0	0	>100	>100	0	0	BD	0	0	0	>100	>100	0	0	BD	0
10/2 and 3/07*	0	5/0	>100	>100	0	0	BD	0	0	0	>100	>100	0	0	BD	0

^a O = EPA test; E = entity test

^b UP = upstream control water

^c C = laboratory water control

^d LC₅₀ = median lethal concentration

^e EC₅₀ = median effects concentration

NT = not tested

* = 48 hour screening test

^f %A = percent adversely affected in 100% effluent

^g %M = percent mortality in 100% effluent

^h TUa = acute toxicity units

ⁱ NF = near field sample in Sandusky River

ND = not determined

BD = below detection

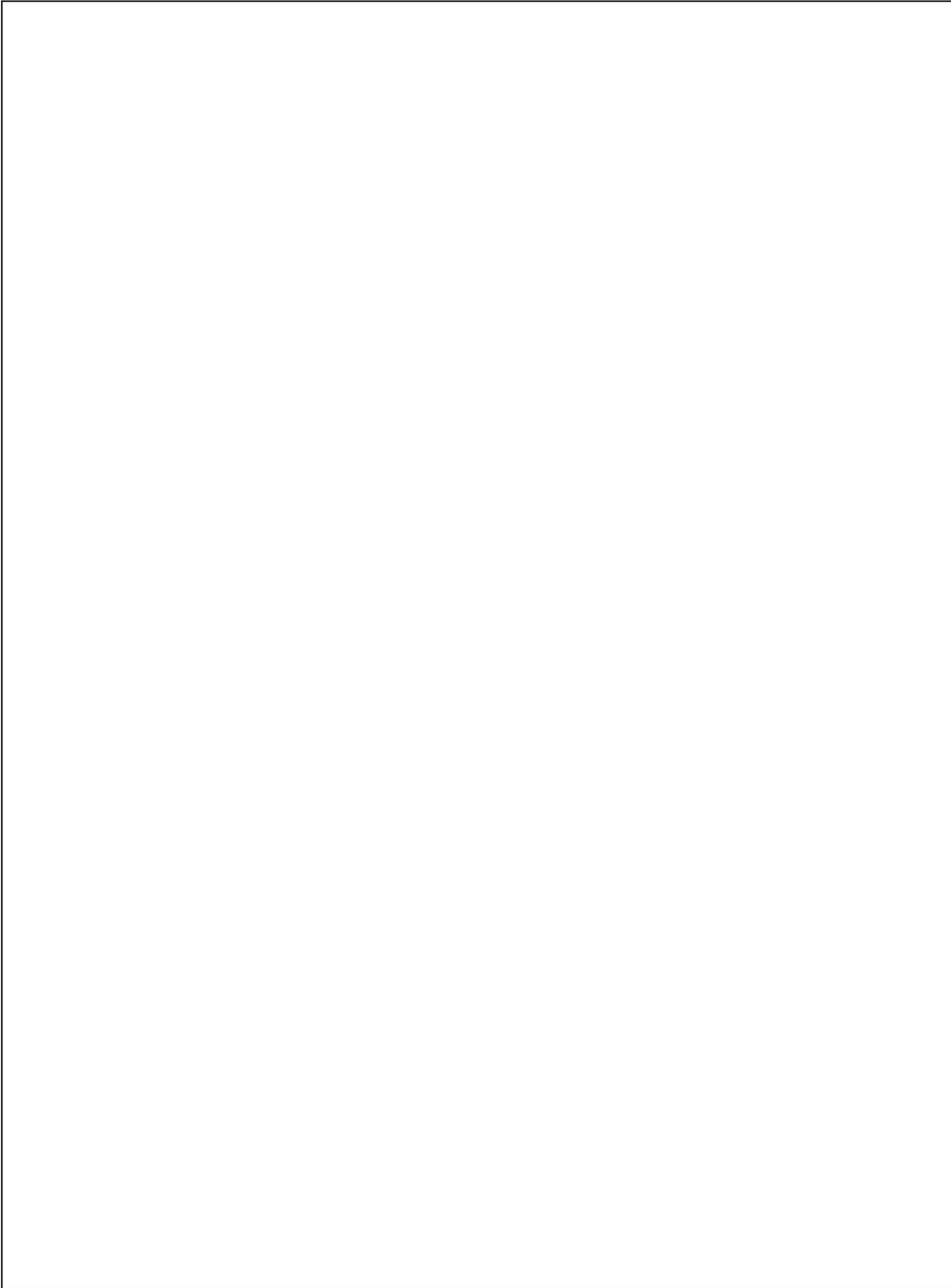


Table 1B. Aquatic life use attainment status of the Sandusky River basin, June-October, 2001. The Index of Biotic Integrity (IBI), Modified Index of Well Being (MIwb) and Invertebrate Community Index (ICI) scores are based on the performance of fish (IBI, MIwb) and macroinvertebrate (ICI) communities. The Qualitative Habitat Evaluation Index (QHEI) is a measure of the ability of the physical habitat to support biological communities.

River Mile Invertebrate/Fish	IBI	MIwb	ICI ^a	QHEI	Attainment Status ^b	Comments
Sandusky River						
<i>Eastern Corn Belt Plains (ECBP) - WWH Use Designation</i>						
127.8/127.8	36 ^{ns}	7.5*	42	82.0	Partial	TR 13, Lower Leesville Rd.
120.8/120.0	37 ^{ns}	7.1*	48	57.0	Partial	CR 55, Locust Grove Rd.
116.2/114.9	40	7.6*	48	60.5	Partial	TR 82, Kiess Rd.
111.2/111.2	<u>24</u> *	6.0*	22*	44.0	NON	Ust. Bucyrus WWTP
110.4/110.4	36 ^{ns}	7.2*	18*	75.0	Partial	CR 121, Kerstetter Rd.
105.8/103.7	37 ^{ns}	9.0	VG	74.5	Full	TR 128, Shupp Rd.
98.7/98.7	44	9.0	44	82.5	Full	SR 231
93.8/93.8	32*	8.2 ^{ns}	48	67.0	Partial	TR 128
90.3/90.3	44	9.0	54	66.0	Full	TR 124
83.3/85.0	43	8.2 ^{ns}	46	59.0	Full	CR 55
78.4/77.9	48	8.1 ^{ns}	44	71.5	Full	CR 121
72.0/72.1	52	9.3	52	76.5	Full	TR 40 (Parker Bridge)
65.0/65.1	53	8.5	E	76.0	Full	CR 16
57.4/57.3	48	8.7	48	60.5	Full	CR 9
52.2/52.2	43	7.5*	<u>12</u> *	50.0	NON	Walnut Grove Campground
47.7/47.8	54	10.3	54	85.0	Full	CR 90
46.8/46.8	53	9.7	48	84.5	Full	From CR 90

Ecoregion Biocriteria: E. Corn Belt Plains (ECBP)

INDEX - Site Type	LRW	MWH channel modified	MWH impounded	WWH	EWH
IBI Headwater - Wading/ Boat	18/18	24/24	-/30	40/ 42	50
MIwb Wading/ Boat	4.0/4.0	6.2/5.8	-/6.6	8.3/ 8.5	9.4/ 9.6
ICI	8	22	-	36	46

* Significant departure from ecoregion biocriterion; poor and very poor results are underlined.

ns Nonsignificant departure from biocriterion (≤ 4 IBI or ICI units; ≤ 0.5 MIwb units).

a Narrative evaluation used in lieu of ICI (E=Exceptional; G=Good; MG=Marginally Good; F=Fair; P=Poor).

b Use attainment status based on one organism group is parenthetically expressed.

N/A Not Applicable. The MIwb is not applicable to headwater sites.

Figure 2. Aquatic life attainment table from *Biological and Water Quality Study of Sandusky River and*

Selected Tributaries, 2001 (Ohio EPA; May 21, 2003).

Table 1A Aquatic life use attainment status for each of eight Watershed Assessment Units and for the Sandusky Large River Unit sampled in 2001. The assessment unit score is an average grade of aquatic life use status. The method of calculation is presented in the 2002 Integrated Water Quality Monitoring and Assessment Report (www.epa.state.oh.us/dsw/tmdl/2002IntReport/2002OhioIntegratedReport.html). An assessment unit score of 80 is used as the benchmark above which a watershed is considered to be in good condition relative to aquatic life uses. A maximum assessment unit score of 100 is possible if all monitored sites meet designated aquatic life uses. The comments provided for each assessment unit include principal causes and sources of impact on aquatic life and recreational uses and significant contaminants in sediment and fish tissue.

usky

Table 1A continued.

Sandusky River - Upper Sandusky (dst. Broken Sword Cr. to ust. Tymochtee Cr.) AU# (04100011 040)	Aquatic Life Attainment Status							Assessment Unit Score
	Total	Full		Partial		NON		
		#	%	#	%	#	%	
Sites < 50mi ² drainage area	15	4	27	2	13	9	60	52
Miles of assessed streams with > 50mi ² and < 500mi ² drainage area	29.0	26.0	90	3.0	10	-	-	
<p>Comments</p> <p>The failure of streams within the assessment unit to attain applicable aquatic life uses and water quality criteria can be largely attributed to agricultural practices within the watershed and pollution from poorly treated sewage. Sedimentation, enrichment/low dissolved oxygen and substrate embeddedness were common impacts where aquatic life use attainment was not fully met. Minimal sustained flow during the summer months also limited pool depths and availability of riffle habitat at some sites. The channelizing of streams, removal of riparian trees and field tiling to facilitate drainage have reduced the volume of water present during dry weather periods, making drought conditions in the streams a much more frequent occurrence. Significant nutrient enrichment and/or organic loading were indicated at sites on the Little Sandusky River resulting from failed on-site septic systems within the Village of Morral.</p> <p>A mercury value exceeding the level established to protect drinking water supplies and prevent contamination of fish tissue was documented in the Sandusky River at TR 124 (RM 90.27). A couple of spills were investigated in 2001. One incident was at the Qualitec Trucking, Inc. facility located at 16303 TR 124, Harpster, OH. It was determined that 1000 gallons of waste oil was deliberately dumped and subsequently leached into a field tile that led directly to the Sandusky River. The Upper Sandusky WWTP reported a spill to the Sandusky River on June 18, 2001. A lift station pump failed and resulted in the bypass of a large amount of sewage directly into the river.</p>								

River and Selected Tributaries, 2001 (Ohio EPA; May 21, 2003).

Year	Median P Conc. (mg/l)	5-Year Median Flow (MGD)	Total P Load (kg/day)*
2005	0.675	1.432	3.66
2006	0.900	1.501	5.11
2007	0.890	1.538	5.18
2008	0.470	1.535	2.73

* Allowable total phosphorus load = 5.3 kg/day

Table 6. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria					Maximum Aquatic Life	Inside Mixing Zone Maximum
		Average			Wildlife	Maximum		
		Human Health	Agri-culture	Aquatic Life				
Ammonia-S	mg/l	--	--	--	1.4	--	--	
Ammonia-W	mg/l	--	--	--	5.6	--	--	
Barium	ug/l	--	160000	--	220	2000	4000	
Bis(2-ethylhexyl)phthalate	ug/l	--	32c	--	8.4	1100	2100	
Cadmium - TR	ug/l	--	730	50	6.5	18	37	
Chloroform	ug/l	--	1700c	--	140	1300	2600	
Chromium - TR	ug/l	--	14000	100	240	5000	10000	
Chromium VI - Diss	ug/l	--	14000	--	11	16	31	
Copper - TR	ug/l	--	64000	500	27	45	90	
Cyanide - free	mg/l	--	48	--	0.0052	0.022	0.044	
Dissolved solids	mg/l	--	--	--	1500	--	--	
Iron - TR	ug/l	--	--	5000	--	--	--	
Lead - TR	ug/l	--	--	100	31	590	1200	
Mercury - TR	ng/l	1.3	3.1	10000	910	1700	3400	
Nickel - TR	ug/l	--	43000	200	150	1300	2700	
Nitrate-N + Nitrite-N	mg/l	--	--	100	--	--	--	
Strontium	ug/l	--	1400000	--	21000	40000	81000	
Zinc - TR	ug/l	--	35000	25000	340	340	690	

Table 7. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
<i>Stream Flows</i>				
1Q10	cfs	annual	1.28	USGS 04196500
7Q10	cfs	annual	1.68	USGS 04196500
30Q10	cfs	summer	2.77	USGS 04196500
		winter	12.85	USGS 04196500
90Q10	cfs	annual	5.54	USGS 04196500
Harmonic Mean	cfs	annual	19.87	USGS 04196500
Mixing Assumption	%	average	25	
	%	maximum	100	
<i>Hardness</i>	mg/l	annual	346	STORET 500860, 2001-08, n=54
<i>pH</i>	S.U.	summer	7.8	SWIMS 901, 2004-09, n=20
		winter	7.7	SWIMS 901, 2004-09, n=15
<i>Temperature</i>	C	summer	24.2	SWIMS 901, 2004-09, n=20
		winter	5.25	SWIMS 901, 2004-09, n=15
<i>Upper Sandusky WWTP flow</i>	cfs	annual	3.09	DSW
<i>Background Water Quality</i>				
Ammonia-S	mg/l		0.055	SWIMS; 2004-09; n=20; 10<MDL; Station 801
Ammonia-W	mg/l		0.21	SWIMS; 2004-09; n=15; 3<MDL; Station 801
Barium	ug/l		68	STORET; 2001; n=7; 0<MDL; Station U02P41
Bis(2-ethylhexyl)phthalate	ug/l		0	No representative data available.
Cadmium - TR	ug/l		0	STORET; 2001; n=7; 7<MDL; Station U02P41
Chloroform	ug/l		0	No representative data available.
Chromium - TR	ug/l		0	STORET; 2001; n=7; 7<MDL; Station U02P41
Chromium VI - Diss	ug/l		0	No representative data available.
Copper - TR	ug/l		0	STORET; 2001; n=7; 7<MDL; Station U02P41
Cyanide - free	mg/l		0	No representative data available.
Dissolved solids	mg/l		520	STORET; 2001; n=7; 0<MDL; Station U02P41
Iron - TR	ug/l		806	STORET; 2001; n=7; 0<MDL; Station U02P41
Lead - TR	ug/l		0	STORET; 2001; n=7; 7<MDL; Station U02P41
Mercury – TR	ng/l		0	No representative data available.
Nickel - TR	ug/l		0	STORET; 2001; n=7; 7<MDL; Station U02P41
Nitrate-N + Nitrite-N	mg/l		5.3	STORET; 2001; n=7; 1<MDL; Station U02P41
Strontium	ug/l		2628	STORET; 2001; n=7; 0<MDL; Station U02P41
Zinc - TR	ug/l		10.5	STORET; 2001; n=7; 2<MDL; Station U02P41

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

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Wildlife	Average			Maximum Aquatic Life	
			Human Health	Agri-culture	Aquatic Life		
Ammonia-S	mg/l	--	--	--	2.6	--	--
Ammonia-W	mg/l	--	--	--	28.0	--	--
Barium	ug/l	--	417108	--	241	2800	4000
Bis(2-ethylhexyl)phthalate	ug/l	--	83	--	9.5	1556	2100
Cadmium - TR	ug/l	--	1904	130	7.4	25	37
Chloroform	ug/l	--	4433	--	159	1839	2600
Chromium - TR	ug/l	--	36506	261	273	7071	10000
Chromium VI - Diss	ug/l	--	36506	--	12	23	31
Copper - TR	ug/l	--	166887	1304	31	64	90
Cyanide - free	mg/l	--	125	--	0.0059	0.031	0.044
Dissolved solids (ave)	mg/l	--	--	--	1633	--	--
Iron - TR	ug/l	--	--	11742	--	--	--
Lead - TR	ug/l	--	--	261	35	834	1200
Mercury - TR (BPO)*	ng/l	1.9	8.1	26076	1034	2404	3400
Mercury - TR (APO)*	ng/l	1.3	3.1	10000	910	1700	3400
Nickel - TR	ug/l	--	112127	522	170	1839	2700
Nitrate-N + Nitrite-N	mg/l	--	--	252	--	--	--
Strontium	ug/l	--	3646422	--	23497	55481	81000
Zinc - TR	ug/l	--	91249	65173	385	476	690

* BPO - Before mixing zone phase out

APO - After mixing zone phase out

Under sections 3745-2-05(A)(2)(iv) and 3745-2-08(L) of the Ohio Administrative Code, mixing zones for mercury and other bioaccumulative chemicals of concern are not allowed after November 15, 2010.

Table 9. Parameter Assessment

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

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

Cadmium - TR	Chloroform	Chromium - TR
Chromium VI - Diss	Cyanide - free	Lead - TR
Nitrate-N + Nitrite-N	Strontium	

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

Copper - TR	Dissolved solids	Iron - TR
Nickel - TR	Zinc - TR	

Group 4: PEQ_{max} >= 50 percent, but < 100 percent of the maximum PEL or
PEQ_{avg} >= 50 percent, but < 100 percent of the average PEL. Monitoring is
appropriate.

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

Limits to Protect Numeric Water Quality Criteria

<u>Parameter</u>	<u>Units</u>	<u>Period</u>	<u>Recommended Effluent Limits</u>	
			<u>Average</u>	<u>Maximum</u>
Barium	ug/l	Annual	241	2800
Bis(2-ethylhexyl)phthalate	ug/l	Annual	9.5	1556
Mercury - TR (BPO)*	ng/l	Annual	1.9	2404
Mercury - TR (APO)*	ng/l	Annual	1.3	1700

* BPO - Before mixing zone phase out

APO - After mixing zone phase out

Under sections 3745-2-05(A)(2)(iv) and 3745-2-08(L) of the Ohio Administrative Code, mixing zones for mercury and other bioaccumulative chemicals of concern are not allowed after November 15, 2010.

Table 10. Final Effluent Limits and Monitoring Requirements for Upper Sandusky Outfall 2PD00039001 and the Basis for Their Recommendation.

Parameter	Units	Effluent Limitations				Basis ^b
		Concentration		Loading (kg/day) ^a		
		Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	
Flow	MGD	----- Monitor -----		-----		M
Temperature	°C	----- Monitor -----		-----		M
Dissolved Oxygen	mg/l	5.2 minimum		--	--	BEJ, EP
CBOD ₅	mg/l	10	15 ^c	75.7	114 ^c	BEJ, EP
Suspended Solids	mg/l	18	27 ^c	136	204 ^c	BEJ, EP
Ammonia-N	mg/l					
Summer		1.75	2.62 ^c	13.2	19.8 ^c	BEJ, EP
Winter		----- Monitor -----		-----		BEJ, EP
Oil and Grease	mg/l	--	10	--	--	WQS, EP
pH	S.U.	----- 6.5 to 9.0 -----		-----		WQS, EP
Fecal Coliform						
Summer Only	#/100ml	1000	2000 ^c	--	--	WQS, EP
Phosphorus, Total	mg/l	1.0	1.5 ^c	7.6	11.4 ^c	PT, EP
Nitrate(N) + Nitrite(N)	mg/l	----- Monitor -----		-----		M
Barium	µg/l					
Interim		----- Monitor -----		-----		BEJ
Final		241	2800	1.82	21.3	WLA
Cyanide, Free	mg/l	----- Monitor -----		-----		M
Cadmium, T. R.	µg/l	----- Monitor -----		-----		M
Chromium, T. R.	µg/l	----- Monitor -----		-----		M
Hex. Chromium (Dissolved)	µg/l	----- Monitor -----		-----		M
Copper, T. R.	µg/l	----- Monitor -----		-----		M
Lead, T. R.	µg/l	----- Monitor -----		-----		M
Mercury, T.	ng/l					
Interim (before 11/1/10)		1.9	2404	0.0000144	0.0182	WLA (BPO)
Final (after 11/1/10)		1.3	1700	0.000010	0.0129	WLA (APO)
Nickel, T. R.	µg/l	----- Monitor -----		-----		M
Zinc, T. R.	µg/l	----- Monitor -----		-----		M
Bis(2-ethylhexyl) phthalate	µg/l	----- Monitor -----		-----		BEJ
Whole Effluent Toxicity						
Acute	TUa	----- Monitor -----		-----		BEJ
Chronic	TUc	----- Monitor -----		-----		BEJ

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

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

^c Weekly average limit.