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 **Newark WWTP**

Public Notice No.: 11-05-045
Public Notice Date: May 13, 2011
Comment Period Ends: June 13, 2011

OEPA Permit No.: **4PE00001*MD**
Application No.: **OH0026678**

Name and Address of Applicant:

City of Newark
40 West Main Street
Newark, Ohio 43055

Name and Address of Facility Where Discharge Occurs:

City of Newark WWTP
1003 East Main Street
Newark, Ohio 43055
Licking County

Receiving Water: **Licking River**

Subsequent Stream Network: **Muskingum River to 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 limits proposed for dissolved oxygen, total suspended solids, ammonia-nitrogen and 5-day carbonaceous biochemical oxygen demand ($CBOD_5$) are all based on plant design criteria. These limits are protective of water quality standards.

Limits proposed for oil and grease, pH, and E.coli are based on Water Quality Standards (OAC 3745-1-07).

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.

A permit schedule of compliance has been included for the overall reduction of phosphorus loading.

Table of Contents

Page

Introduction 1

Table of Contents 3

Procedures for Participation in the Formulation of Final Determinations 5

Location of Discharge/Receiving Water Use Classification 6

Existing Facility Description 6

Description of Existing Discharge 6

Assessment of Impact on Receiving Waters 8

Development of Water Quality Based Effluent Limits 8

Reasonable Potential / Effluent Limits / Hazard Management Decisions 9

List of Figures

Figure 1. Location of Newark WWTP 12

Figure 2. Diagram of Wastewater Treatment System 13

List of Tables

Table 1. City of Newark WWTP Combined Sewer Overflow Locations 7

Table 2. Effluent Characterization Using Ohio EPA Data 14

Table 3. Effluent Data and Projected Effluent Quality Values 16

Table 4a. Water Quality Criteria in the Study Area 17

Table 4b. Water Quality Criteria in the Study Area: Hardness-Based Metals. 18

Table 5. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria 19

Table 6. Instream Conditions and Discharger Flow 20

Table 7. Parameter Assessment 22

Table 8. Final Effluent Limits and Monitoring Requirements 23

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 Daniel A. Kopec, (614) 644-1987, daniel.kopec@epa.state.oh.us.

Location of Discharge/Receiving Water Use Classification

The Newark WWTP discharges to the Licking River at River Mile (RM) 28.55. The approximate location of the facility is shown in Figure 1.

The Licking River is designated for the following uses under Ohio's Water quality Standards (OAC 3745-1-24): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Primary Contact Recreation (PCR), Class A. This section of the Licking River is described by Ohio EPA River Code 17-200 and USEPA River Reach 05040006-005.

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 City of Newark WWTP is designed to treat an average daily flow of 8.0 MGD and a peak hydraulic flow of 16.0 MGD. The treatment plant was originally constructed in 1948 and the most recent upgrade occurred in 2000. Treatment plant processes and/or equipment include: bar screens, grit and scum removal, flow equalization, primary settling, activated sludge aeration, biological nitrification and BOD removal, biological phosphorus removal, secondary clarification, post aeration, and ultraviolet disinfection.

Sludge is processed by gravity belt thickening, followed by anaerobic digestion and belt filter presses. Dewatered sludge is then applied at agronomic rates. The City's sludge management plan was approved on March 25, 1997.

The City of Newark's collection system includes both combined and separate sanitary sewers. Approximately 67% of the collection system consists of separate sanitary sewers while 33% are combined storm and sanitary sewers. The collection system also includes 25 authorized combined sewer overflows (CSOs) in the combined collection system that can legally discharge wastewater to the North Fork Licking River, the South Fork Licking River, Raccoon Creek, and Licking River during periods of wet weather. In addition the treatment plant has two bypasses which may discharge during wet weather - one which bypasses raw sewage and the second which bypasses settled sewage.

The City of Newark has an approved pretreatment program which was initially approved in 1985. There are four categorical industrial users and ten non-categorical significant industrial users.

The current average inflow and infiltration flow rate in gallons per day (GPD) for the sewerage system is 4500,000 GPD. To minimize inflow and infiltration the City of Newark is implementing a Combined Sewer Overflow (CSO) Long Term Control Plan (LTCP). They are also using a camera inspection of sewers to determine the areas needing repair.

There have been many studies performed and submitted over the past several years on the collection system. Malcolm Pirnie, Inc. wrote a 20 Year Master Plan on July 1, 2002. On August 11, 2003 the City of Newark authored a Proposed Action Plan and an I&I Removal Report. On June 1, 2004 Malcolm Pirnie, Inc. did a Collection System Overflow Plan and a Sanitary Sewer Extension Study. The City of Newark completed a CSO LTCP Annual Operation Report on January 30th for the following years: 1999, 2000, 2001, 2002, 2003, and 2004. On November 1, 2003 the City of Newark authored a Nine Minimum Controls Plan.

The City of Newark started construction of the High Rate Treatment System (HRT) at the WWTP in March 2009. The proposed completion date is early 2011. This system consists of influent pumping, screening, grit removal, coagulation and flocculation, disinfection, and discharging up to 28 MGD of treated water in the Licking River. Other items in the project include replace of influent pump VFD's, rehabilitation of an EQ basin, check valve installation on two CSOs, and a new Operator's control room.

Description of Existing Discharge

Table 1 presents all the approved combined sewer overflow station numbers and locations

Table 2 presents chemical specific data compiled from the NPDES renewal application, data reported in annual pretreatment reports, and data collected by Ohio EPA.

Table 3 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 4PE00001001. Data are presented for the period January 2006 thru December 2010, and current permit limits are provided for comparison.

Table 4 summarizes the chemical specific data for outfall 4PE00001001 by presenting the average and maximum Projected Effluent Quality (PEQ) values.

Table 1. City of Newark WWTP Combined Sewer Overflow Locations

Station Number	Description	Latitude	Longitude	Receiving Stream
004	West Bank of N. Fork Licking River, East End of East North Street	40°04'15"	82°24'00"	North Fork Licking River
005	West Bank of North Fork Licking River, East End of East Church Street	40°03'39"	82°23'48"	North Fork Licking River
006	East Bank of North Fork Licking River, West End of Monroe Street	40°03'25"	82°23'42"	North Fork Licking River
008	North Bank of South Fork Licking River, South of Ohio Street Bridge	40°03'11"	82°23'30"	South Fork Licking River
009	West Bank of North Fork Licking River, Northwest Corner of Manning Street Bridge	40°04'21"	82°24'06"	North Fork Licking River
012	South Bank of South Fork Licking River, North End of Nathaniel Avenue	40°03'05"	82°23'44"	South Fork Licking River
013	North Bank of South Fork Licking River, Northeast Corner of South Second Street Bridge	40°03'02"	82°23'38"	South Fork Licking River
014	North Bank of South Fork Licking River at Nathaniel Drive Flood Station	40°02'51"	82°24'08"	South Fork Licking River
015	South Bank of South Fork Licking River, North End of Franklin Avenue	40°02'42"	82°24'28"	South Fork Licking River
016	West Bank of South Fork Licking River, South of Orchard Street Bridge	40°02'30"	82°24'49"	South Fork Licking River
017	West Bank of Raccoon Creek, East of Iron Avenue	40°03'02"	82°24'41"	Raccoon Creek
018	East Bank of Raccoon Creek, North of B&O Railroad Bridge	40°03'10"	82°24'31"	Raccoon Creek
019	West Bank of Raccoon Creek, South of Wilson Street Bridge	40°03'11"	82°24'42"	Raccoon Creek
020	East Bank of Raccoon Creek, North of Wilson Street Bridge	40°03'12"	82°24'42"	Raccoon Creek
021	East Bank of Raccoon Creek, South of Jefferson Street Bridge	40°03'14"	82°24'43"	Raccoon Creek
022	East Bank of Raccoon Creek, North of West Main Street Bridge	40°03'19"	82°24'46"	Raccoon Creek
023	North Bank of Raccoon Creek, South End of Ninth Street	40°03'19"	82°24'42"	Raccoon Creek
024	North Bank of Raccoon Creek, south End of Tenth Street	40°03'20"	82°24'57"	Raccoon Creek
025	South Bank of Raccoon Creek, Under Eleventh Street Bridge	40°03'19"	82°25'03"	Raccoon Creek
026	North Bank of Raccoon Creek, Northwest Corner of Eleventh Street Bridge	40°03'19"	82°25'04"	Raccoon Creek
027	South Bank of Raccoon Creek, North End of North Pine Street	40°03'21"	82°25'18"	Raccoon Creek
028	South Bank of Raccoon Creek, North End of Bowers Avenue	40°03'25"	82°25'32"	Raccoon Creek
029	West Bank of Raccoon Creek, Rear of #350 North 21st Street	40°03'48"	82°25'43"	Raccoon Creek
030	North Bank of Raccoon Creek, East of North 21st Street, North of Expressway	40°03'48"	82°25'43"	Raccoon Creek
033	East Bank of North Fork Licking River, North of Everett Avenue Bridge	40°03'41"	82°23'47"	North Fork Licking River

Assessment of Impact on Receiving Waters

The most recent biological sampling in the Licking River downstream of the Newark WWTP was conducted in 2008 and the results indicated that the river was in FULL attainment of the WWH use designation. However, nutrient loadings are causing impairments in Dillon Reservoir, which is further downstream from the study area covered in this report. A TMDL study is currently underway to address these and other issues.

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.

Two dischargers to the South Fork Licking River were included in an interactive model for the wasteload allocation (WLA). Approximately 3.7 miles of the South Fork Licking and Licking Rivers were modeled using the CONSWLA model for conservative (non-decaying) parameters. Dischargers receiving allocations were the Newark and Heath WWTPs.

Parameter Selection Effluent data for the Newark WWTP was 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 (DMRs)	January 2006 through December 2010
Pretreatment Data	2006 through 2008
Ohio EPA Data (compliance, survey)	2009 through 2010

The effluent data were checked for outliers and one value for cadmium of 25.7 µg/l was eliminated from the data set. The average and maximum projected effluent quality (PEQ) values are presented in Table 4. For a summary of the screening results, refer to the parameter groupings at the end of this section.

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 8 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
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

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

The data used in the WLA are listed in Tables 2 and 3. The wasteload allocation results to maintain all applicable criteria are presented in Table 4. The current permit limits for NH_3-N were evaluated and are adequate to maintain instream WQS. Therefore, NH_3-N will not be addressed further in this report.

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 Newark WWTP, the wasteload allocation values are 0.52 TU_a and 1.95 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.

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

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

The acute wasteload allocation for Newark WWTP 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 4. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table _, 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 8.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 9 presents the final effluent limits and monitoring requirements proposed for 4PE00001 outfall 001 and the basis for their recommendation.

The Ohio EPA risk assessment (Table 8) places Fluroanthene , Lead, and Selenium in group 5. The placement of these parameters along with 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 PEQ is greater than 100 percent of the wasteload allocation. Pollutants that meet this requirement must have permit limits under OAC Rule 3745-33-07(A)(1).

Ohio EPA risk assessment (Table 8) places Bis (2-EHP) , Hexavalent Chromium, Mercury, and Total Dissolved Solids in group 4. The placement of these parameters along with the data in Tables 2 and 3 supports that these parameters do not have the reasonable potential to contribute to WQS exceedance, and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC Rule 3745-33-07(A)(2).

Ohio EPA risk assessment (Table 8) places Cadmium, Chloroform, Copper, Nickel, and Zinc in group 3. The placement of these parameters along with the data in Tables 2 and 3 supports that these parameters do not have the reasonable potential to contribute to WQS exceedance, and limits are not necessary to protect water quality.

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 *The* allowable effluent toxicity (AET) is a factor considered in evaluating whole effluent toxicity. The AET calculations are similar to those for aquatic life criteria (using the chronic toxicity unit (TU_c) and 7Q10 for average and the acute toxicity unit (TU_a) and 1Q10 for maximum). For the Newark WWTP, the AET values are 0.52 TU_a and 1.95 TU_c.

Other Requirements

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 Newark WWTP 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 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 represents language necessary to implement rule 3745-7-02 of the Ohio Administrative Code (OAC), and requires the permittee to designate one or more operator of record to oversee the technical operation of the Newark WWTP.

Storm Water Compliance
Under the provisions of the NPDES Phase II Storm Water Program Final Rule, Publically Owned Treatment Works (POTWs) with a design flow greater than 1.0 mgd or those required to have a pretreatment program that discharge storm water directly to state surface waters (not to the POTW) were required to apply for an industrial storm water discharge permit by March 10, 2003. Since the Newark WWTP submitted a "No Exposure Certification" their draft permit will not need Parts IV, V, and VI of the storm water language.

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

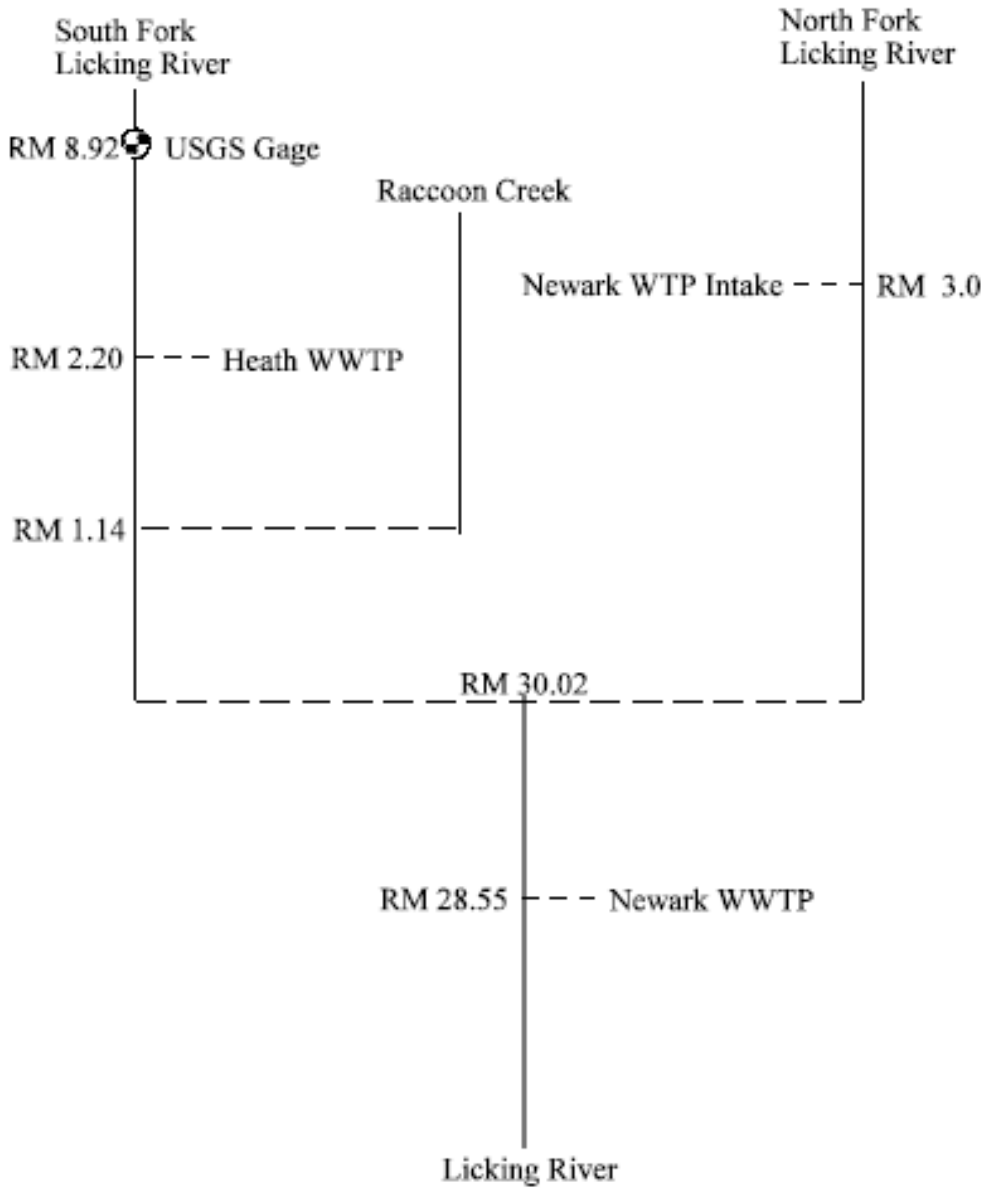

Figure 1. Approximate location of the Newark WWTP

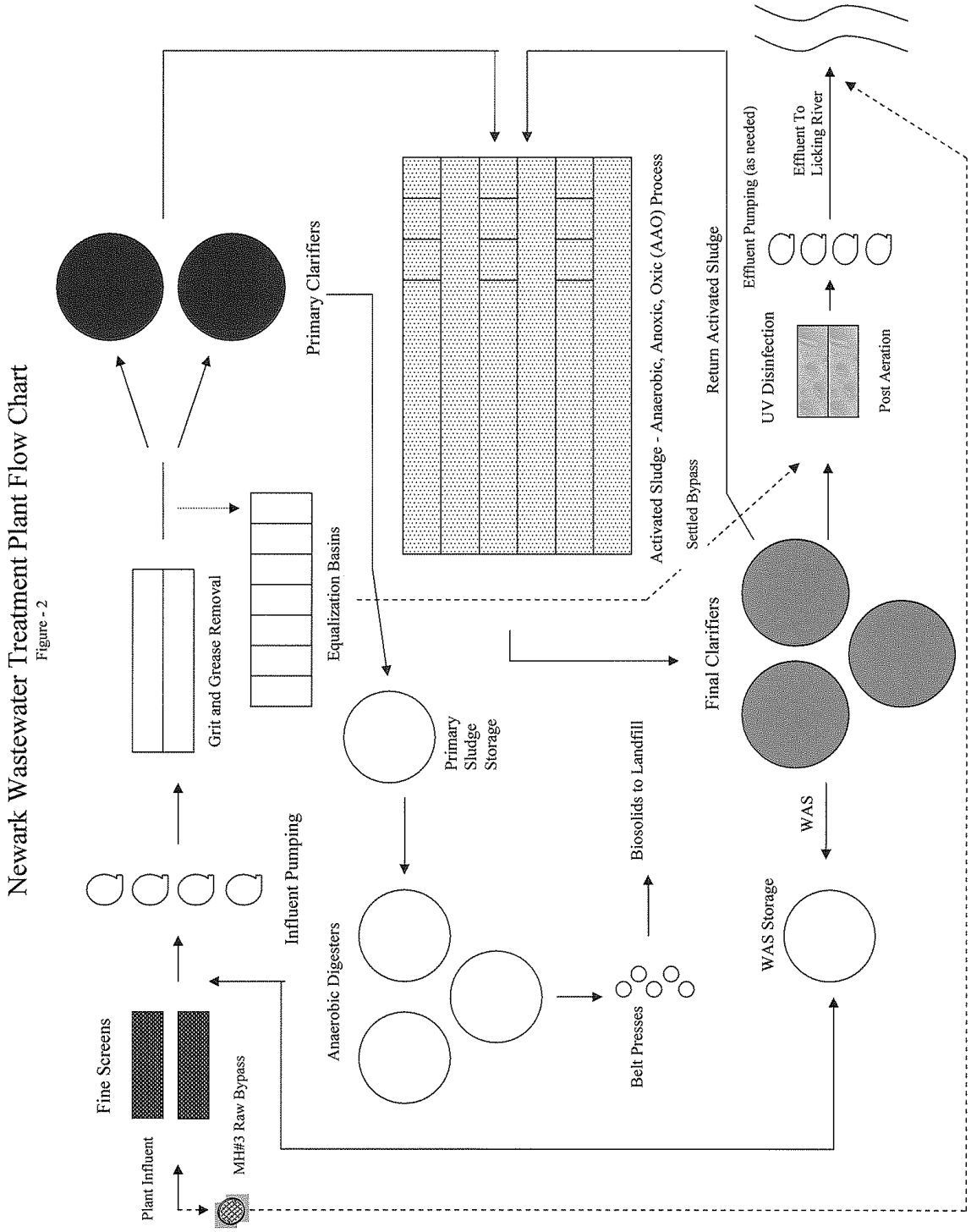

Figure 2. Diagram of Wastewater Treatment System

Table 2. Effluent Characterization Using Ohio EPA & Pretreatment Data

Summary of analytical results for the Newark WWTP outfall 4PE00001001. PT = data from, pretreatment program reports; OEPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

PARAMETER	PT Sept. 06	PT Sept. 07	PT Sept. 08	OEPA 12/2/09	OEPA 3/29/10	DECISION CRITERIA	
						PEQ_{avg}	PEQ_{max}
Arsenic (ug/l)	8.3	7.4	ND	ND	ND	23.02	31.54
Copper (ug/l)	11	9.0	3	8.8	5.3	18.47	25.3
Nickel (ug/l)	30	50	ND	24.5	16.3	94.9	130
Zinc (ug/l)	105	12	12	35	20	176.3	241.5
Chlorodibromomethane (ug/l)	1.6	ND	ND	ND	ND	7.24	9.92
Chloroform (ug/l)	2.8	32.3	ND	ND	0.65	70.7	96.9
Dichlorobromomethane (ug/l)	2.2	ND	ND	ND	ND	9.95	13.64
Hexachloroethane (ug/l)	2.7	ND	ND	ND	ND	12.22	16.74
Phenol (ug/l)	1.8	ND	ND	ND	ND	8.15	11.16
Bis(2-ethylhexyl)phthalate (ug/l)	ND	5.1	1.8	ND	ND	14.15	19.38
Naphthalene (ug/l)	ND	ND	1.8	ND	ND	8.15	11.16
Total Chromium (ug/l)	ND	0.8	ND	5.4	4.4	14.97	20.52
Benzene (ug/l)	ND	1.4	ND	ND	ND	6.33	8.68
1,1,1,-Trichloroethane (ug/l)	ND	4.7	ND	ND	ND	21.27	29.14
Fluoranthene (ug/l)	ND	2.4	ND	ND	ND	10.86	14.88
Total Dissolved Solids (mg/L)	NA	NA	NA	1010	714	2801.7	3838
Formaldehyde (mg/L)	ND	0.06	ND	NA	NA	0.272	0.372
Calcium (mg/L)	NA	NA	NA	48	44	133.1	182.4
Hardness, Total (mg/L)	NA	NA	NA	342	242	948.7	1299.6
Iron (ug/l)	NA	NA	NA	51	ND	230.8	316.2
Magnesium (mg/L)	NA	NA	NA	54	32	149.8	205.2
Manganese (ug/l)	NA	NA	NA	19	25	69.35	95
Potassium (mg/L)	NA	NA	NA	12	7	33.3	45.6

Sodium (mg/L)	NA	NA	NA	239	141	662.9	908.2
Strontium (ug/l)	NA	NA	NA	241	158	668.5	915.8
Alkalinity (mg/L)	NA	NA	NA	200	154	554.8	760
Ammonia (mg/L)	NA	NA	NA	0.429	0.723	2.00	2.75
COD (mg/L)	NA	NA	NA	32	20	88.77	121.6
Chloride (mg/L)	NA	NA	NA	127	113	352.3	482.6
Conductivity umhos/cm	NA	NA	NA	1590	1160	4410.6	6042
Nitrate + Nitrite (mg/L)	NA	NA	NA	21.3	17.2	59.08	80.94
TKN (mg/L)	NA	NA	NA	2.31	2.25	6.24	8.55
Total Phosphorus (mg/L)	NA	NA	NA	NA	13.5	61.1	83.7
pH (S.U.)	NA	NA	NA	7.26	7.15	20.14	27.58
Fecal Coliform (#/100mL)	NA	NA	NA	7300	8200	22746.8	31160

Table 3. Effluent Data for Newark WWTP and Projected Effluent Quality Values

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Self-Monitoring (DMR) Data					
Ammonia, summer	mg/l	247	205	0.116	0.217
Ammonia, winter	mg/l	185	170	0.52	1.137
NO_2+NO_3 [B]	mg/l	64	64	22.7	32.06
Phosphorus	mg/l	60	60	36.6	52.45
Cyanide, free	mg/l	71	0	--	--
Selenium	µg/l	70	34	6.748	9.808
Nickel [B]	µg/l	40	36	70.82	97.02
Zinc [B]	µg/l	40	40	84.32	115.5
Cadmium	µg/l	69	20	2.127	3.195
Lead	µg/l	70	34	34.31	47.0
Chromium, total [B]	µg/l	36	20	20.48	28.05
Copper [B]	µg/l	75	72	12.79	17.73
Chromium^{+6}, diss.	µg/l	74	39	12.22	16.74
Antimony	µg/l	68	23	19.06	19.55
Bis (2-EHP)[A B]	µg/l	101	73	9.668	14.96
Mercury	µg/l	39	39	0.0099	0.0157
Total Dissolved Solids [B]	mg/l	112	112	1384.6	1698.
Ohio EPA & Pretreatment Data					
Arsenic	µg/l	5	2	13.94	19.09
Chlorodibromomethane [A]	µg/l	5	1	2.686	3.68
Chloroform [A]	µg/l	5	3	54.23	74.29
Dichlorobromomethane [A]	µg/l	5	1	3.694	5.06
Hexachloroethane [A]	µg/l	5	1	4.533	6.21
Phenol	µg/l	5	1	3.022	4.14
Naphthalene	µg/l	5	1	3.022	4.14
Benzene [A]	µg/l	5	1	2.351	3.22
1,1,1,-Trichloroethane	µg/l	5	1	7.891	10.81
Fluoranthene	µg/l	5	1	4.03	5.52
Formaldehyde	mg/l	3	1	0.131	0.18
Calcium	mg/l	2	2	133.1	182.4
Iron	µg/l	2	1	141.5	193.8
Magnesium	mg/l	2	2	149.8	205.2
Manganese	µg/l	2	2	69.35	95.0
Potassium	mg/l	2	2	33.3	45.6
Sodium	mg/l	2	2	662.9	908.2
Strontium	µg/l	2	2	668.5	915.8
Chloride	mg/l	2	2	352.3	482.6

[A] Carcinogen
[B] Combined DMR and Ohio EPA/Pretreatment Data

Table 4a. Water Quality Criteria in the Study Area

		Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Antimony	µg/l	4300.	--	190.	900.	1800.
Arsenic	µg/l	--	100.	150.	340.	680.
Benzene	µg/l	710.	--	160.	700.	1400.
Bis (2-EHP)	µg/l	59.	–	8.4	1100.	2100.
Chlorine, tot res.	µg/l	--	--	11.	19.	38.
Chlorodibromomethane	µg/l	340.	--	--	--	--
Chloroform	µg/l	4700.	--	140.	1300.	2600.
Chromium^{+6}, diss.	µg/l	--	--	11.	16.	31.
Cyanide, free	µg/l	220000.	--	12.	46.	92.
Dichlorobromomethane	µg/l	460.	--	--	--	--
Fluoranthene	µg/l	370.	--	0.8	3.7	7.4
Hexachloroethane	µg/l	89.	--	--	--	--
Iron	µg/l	--	5000.	--	--	--
Mercury	µg/l	0.012	10.	0.91	1.7	3.4
Molybdenum	µg/l	--	--	20000.	190000.	370000.
Naphthalene	µg/l	--	--	21.	170.	340.
NO_3+NO_2	mg/l	--	100.	--	--	--
Phenol	µg/l	4600000.	--	400.	4700.	9400.
Selenium	µg/l	11000.	50.	5.0	–	--
Strontium	µg/l	--	--	21000.	40000.	81000.
1,1,1,-Trichloroethane	µg/l	--	--	76.	690.	1400.
TDS	mg/l	--	--	1500.	--	--

Table 4b. Water Quality Criteria in the Study Area; Hardness-Based Metals.

		Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Licking River downstream of Newark WWTP; Hardness=263. mg/l						
Cadmium	µg/l	--	50.	5.3	13.	27.
Chromium, tot.	µg/l	--	100.	190.	4000.	8000.
Copper	µg/l	1300.	500.	21.	35.	70.
Lead	µg/l	--	100.	22.	420.	840.
Nickel	µg/l	4600.	200.	120.	1100.	2100.
Zinc	µg/l	69000.	25000.	270.	270.	540.
South Fork Licking River downstream of Heath WWTP; Hardness=242. mg/l						
Cadmium	µg/l	--	50.	4.9	12.	24.
Chromium, tot.	µg/l	--	100.	180.	3700.	7400.
Copper	µg/l	1300.	500.	20.	32.	64.
Lead	µg/l	--	100.	20.	380.	750.
Nickel	µg/l	4600.	200.	110.	990.	2000.
Silver	µg/l	--	--	1.3	7.3	15.
Zinc	µg/l	69000.	25000.	250.	250.	510.

Table 5. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average Human Health	Average Agri Supply	Average Aquatic Life	Maximum Aquatic Life	Inside Mixing Zone Maximum
Arsenic [B]	µg/l	--	426.	233.	479.	680.
Bis (2-EHP)	µg/l	255.	--	13.	1554.	2100.
Cadmium	µg/l	--	217.[A]	8.3	19.	27.
Chloroform	µg/l	24910. [A]	--	267.	2239.	2600.
Chromium^{+6}, diss.	µg/l	--	--	17.	23.	31.
Chromium, tot.[B]	µg/l	--	435.	299.	5705.	8000.
Copper	µg/l	5646.[A]	2168.[A]	32.	49.	70.
Cyanide, free [B]	µg/l	956500.[A]	--	19.	65.	92.
Fluoranthene	µg/l	1961. [A]	--	1.5	6.4	7.4
Lead	µg/l	--	432.	34.	600.	840.
Mercury [C]	µg/l	0.012	10.[A]	0.91	1.7	3.4
Molybdenum [B]	µg/l	--	--	31240.	268400.	370000.
Nickel	µg/l	19990.[A]	862.	188.	1573.	2100.
Selenium	µg/l	47830.	217.	7.8	--	--
TDS	mg/l	--	--	2108.	--	--
Zinc	µg/l	300000.[A]	108700.[A]	423.	384.	540.

[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] BCC: no mixing zone allowed unless the requirements for an exclusion are met as listed in 3745-2-08(L).

Table 6. Instream Conditions and Discharger Flow

Parameter	Units		Value	Basis
South Fork Licking River Flows:				
1Q10	cfs	annual	1.61	USGS gage #03145000, 1939-97 data
7Q10	cfs	annual	2.53	USGS gage #03145000, 1939-97 data
30Q10	cfs	summer	4.14	USGS gage #03145000, 1939-97 data
30Q10	cfs	winter	18.41	USGS gage #03145000, 1939-97 data
Harmonic Mean Flow	cfs	annual	22.89	USGS gage #03145000, 1939-97 data
Raccoon Creek Flows:				
1Q10	cfs	annual	2.58	USGS gage #03145500, 1939-48 data
7Q10	cfs	annual	2.83	USGS gage #03145500, 1939-48 data
30Q10	cfs	summer	3.20	USGS gage #03145500, 1939-48 data
30Q10	cfs	winter	6.14	USGS gage #03145500, 1939-48 data
Harmonic Mean Flow	cfs	annual	11.05	USGS gage #03146500, 1939-97 data
North Fork Licking Flows:				
1Q10	cfs	annual	2.04	USGS gage #03146250, 1944-77 data
7Q10	cfs	annual	3.12	USGS gage #03146250, 1944-77 data
30Q10	cfs	summer	5.27	USGS gage #03146250, 1944-77 data
30Q10	cfs	winter	17.1	USGS gage #03146250, 1944-77 data
Harmonic Mean Flow	cfs	annual	16.58	USGS gage #03146000, 1939-82 data
Mixing Assumption	%	average	100.	Stream-to-discharge ratio
	%	maximum	100.	Stream-to-discharge ratio
Instream Hardness:				
South Fork Licking River	mg/l	annual	242.	Heath 901; 23 values, 0<MDL,2006-10
Licking River	mg/l	annual	263.	Newark 901;60 values,0<MDL,2006-10
Background Water Quality for the South Fork Licking:				
Arsenic	µg/l	annual	3.9	STORET; 14 values, 4<MDL, 2008
Bis (2-EHP)	µg/l	annual	1.32	STORET; 1 value, 0<MDL, 2008
Cadmium	µg/l	annual	0.1	STORET; 14 values,13<MDL, 2008
Chlorine, tot res	mg/l	annual	0.	No representative data available.
Chloroform	µg/l	annual	0.	STORET; 1 value, 1<MDL, 2008
Chromium^{+6}, diss.	µg/l	annual	0.	No representative data available.
Chromium, tot.	µg/l	annual	0.	STORET; 14 values,14<MDL, 2008
Copper	µg/l	annual	3.4	STORET; 14 values, 3<MDL, 2008
Cyanide, free	µg/l	annual	0.	No representative data available.
Fluoranthene	µg/l	annual	0.	STORET; 1 value, 1<MDL, 2008
Lead	µg/l	annual	1.0	STORET; 14 values, 12<MDL, 2008
Mercury	µg/l	annual	0.	No representative data available.
Molybdenum	µg/l	annual	0.	No representative data available.
Nickel	µg/l	annual	3.1	STORET; 14 values, 3<MDL, 2008
Selenium	µg/l	annual	0.	STORET; 14 values,14<MDL, 2008
Silver	µg/l	annual	0.	No representative data available.
TDS	mg/l	annual	429.	STORET; 14 values, 0<MDL, 2008

Zinc	µg/l	annual	5.0	STORET; 14 values,10<MDL, 2008

Discharger Flows:

Heath WWTP flow	cfs	design	2.71	DSW
Newark WWTP flow	cfs	design	12.38	DSW

Table 7. Parameter Assessment

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

Calcium	*Chloride*	*Formaldehyde*
Magnesium	*Manganese*	*Potassium*
Phosphorus	*Sodium*	

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

Antimony	*Arsenic*	*Benzene*
Chlorodibromomethane	*Chromium, tot.*	*Cyanide, free*
Dichlorobromomethane	*Hexachloroethane*	*Iron*
MolybdenumNaphthalene	*NO_3+NO_2*	*1,1,1,-Trichloroethane*
Phenol	*Strontium*	

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

Cadmium	*Chloroform*	*Copper*
Nickel	*Zinc*	

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

Bis (2-EHP)	*$Chromium^{+6}$, diss.*	*Mercury*
TDS		

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

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Applicable Period	Recommended Effluent Limits Average	Maximum
Fluroanthene	*µg/l*	*annual*	*1.5*	*6.4*
Lead	*µg/l*	*annual*	*34*	*600*
Selenium	*µg/l*	*annual*	*7.8*	*--*

Table 8. Final effluent limits and monitoring requirements for Newark WWTP outfall 4PE00001001 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	
Flow	MGD	----------Monitor----------				M[c]
Temperature	°C	----------Monitor----------				M[c]
Dissolved Oxygen	mg/l					
Summer		----------6.0 min----------				PD/EP
Winter		----------2.0 min----------				PD/EP
CBOD	mg/l					
Summer		15	23[d]	454	697[d]	PD/EP
Winter		25	40[d]	757	1212[d]	BPT
Suspended Solids	mg/l					
Summer		15	23[d]	454	697[d]	PD/EP
Winter		30	45[d]	909	1363[d]	BPT
Ammonia	mg/l					
Summer		2.2	3.3[d]	66.6	99.9[d]	EP
Winter		10.5	15.8[d]	318	478[d]	EP
Phosphorus	mg/l	----------Monitor----------				M[c]
Oil & Grease	mg/l	----------Not to Exceed 10.0----------				WQS
pH	S.U.	----------6.5 to 9.0----------				WQS
E.coli	#/100mL	126	284	--	--	WQS
Mercury	ug/L	----------Monitor----------				M[c] /RP
Nitrate-N + Nitrite-N	mg/L	----------Monitor----------				M[c] /RP
Zinc,T.R.	ug/L	----------Monitor----------				M[c] /RP
Chromium, T. R.	ug/L	----------Monitor----------				M[c] /RP
Nickel, T.R.	ug/L	----------Monitor----------				M[c]/EP
Cadmium	ug/L	----------Monitor----------				M[c]/RP
Copper	ug/L	----------Monitor----------				M[c]/EP
Antimony	ug/L	----------Monitor----------				M[c]/RP
Bis (2-EHP)	ug/L	12	1482	0.363	44.9	EP/RP
Hexavalent Chromium	ug/L	16	22	0.48	0.67	EP/RP
Cyanide, Free	mg/L	0.017	0.062	0.52	1.9	EP/RP
Lead	ug/L	32	574	0.97	17.4	ABS
Selenium	ug/L	7.8	--	0.237	--	WLA
Total Dissolved Solids	mg/L	----------Monitor----------				M[c]
Fluroanthene	ug/L	1.5	6.4	--	--	WLA
Whole Effluent Toxicity						
Acute	TUa	----------Monitor----------				WET
Chronic	TUc	----------Monitor----------				WET

[a] Effluent loadings based on average design discharge flow of 8.0 MGD.

[b] Definitions: ABS = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l)); BPT = Best Practicable Waste Treatment Technology, 40 CFR Part 133, Secondary Treatment Regulation; EP = Existing Permit; M = Monitoring; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ; WLA = Wasteload Allocation procedures (OAC 3745-2); WQS = Ohio Water Quality Standards (OAC 3745-1).

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

[d] 7 day average limit.