pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0097756**
Facility Type	**Industrial**	APS ID	**838632**
Major / Minor	**Minor**	Authorization ID	**1319558**

NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER

Applicant and Facility Information

Applicant Name	**Highland Sewer & Water Authority**	Facility Name	**Beaverdam Reservoir WTP**
Applicant Address	120 Tank Drive	Facility Address	1819 Shawnee Road
	Johnstown, PA 15904-3251		Sidman, PA 15955-5307
Applicant Contact	Jeremy Horvath	Facility Contact	Same as Applicant
Applicant Phone	(814) 266-3146	Facility Phone	Same as Applicant
Client ID	34572	Site ID	246329
SIC Code	4941	Municipality	Summerhill Township
SIC Description	Trans. & Utilities - Water Supply	County	Cambria
Date Application Received	June 26, 2020	EPA Waived?	Yes
Date Application Accepted	July 31, 2020	If No, Reason	
Purpose of Application	Renewal NPDES Permit Coverage		

Summary of Review

The Department received an NPDES permit renewal application from the Highland Sewer and Water Authority on June 26, 2020 for the coverage of its Beaverdam Water Treatment Plant. This facility is a public water supply system with a standard industrial classification (SIC) code of 4941.

The facility treats raw water from the Beaverdam Reservoir. The wastewater generated at the facility from the water treatment process is filter backwash wastewater and wastewater sludge. The sludge collected in the sedimentation tanks and the filter backwash wastewater is collected in two settling ponds. Only one of the two settling ponds are in operation at a time. The supernatant from the ponds discharge to Beaverdam Run via Outfall 001. The settled sludge is drawn off approximately every 6 months and placed on sludge drying beds. The drying basins have an underdrain system that discharges effluent to Beaverdam Run via Outfall 001. The underdrain system consists of 6” of sand, 4” of pea gravel, 8” of coarse aggregate, and a drain to Outfall 001. Beaverdam Run is designated in 25 PA Code Chapter 93 as a High-Quality Cold-Water Fishery. The Beaverdam Run is also within the Kiskiminetas-Conemaugh River Watersheds for which the Department has developed Total Maximum Daily Loads, TMDL.

Beaverdam Run was designated as a High-Quality stream in 1979 and the site was in operation before the designated date. The site was upgraded in 1988 which should have resulted in an anti-degradation analysis to be conducted for the discharge from the site; however, an anti-degradation was not conducted. If the Department had conducted the anti-deg analysis as required, it is likely that the plant expansion would have included treatment components and features designed to achieve the anti-degradation limitations or Highland Sewer and Water Authority would have pursued some other path to compliance such as Social-Economical Justification (SEJ); treatment elsewhere; or maintaining the existing plant flows. Since the Department did not evaluate anti-deg, the Department is on record as approving the expansion and maintenance of the existing effluent limits as adequate. Although the Department has the option of correcting this oversight from over 30 ago, the Department has determined that it would be unfair to revisit the anti-degradation analysis so long in the future (32 years

Approve	Deny	Signatures	Date
X		Adam Olesnanik / Environmental Engineering Specialist	9/8/2020
X		Michael E. Fifth, P.E. / Environmental Engineer Manager	9/24/2020

Summary of Review

later). Conducting an anti-deg analysis so long after the plant expansion would likely result in an unexpected financial burden for the plant and legal challenges. That being said, the Department would like to note that any future upgrades or expansions to the site will require an anti-degradation analysis and the facility would likely receive new anti-degradation limitations.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	6.0
Latitude	40º 19' 17"	Longitude	-78º 39' 40"
Quad Name	Beaverdale	Quad Code	1616
Wastewater Description:	IW Process Effluent without ELG		

Receiving Waters	Beaverdam Run (HQ-CWF)	Stream Code	45917
NHD Com ID	123713442	RMI	0.75
Drainage Area	6.39	Yield (cfs/mi^2)	0.085
Q_{7-10} Flow (cfs)	0.545	Q_{7-10} Basis	StreamStats
Elevation (ft)	2324	Slope (ft/ft)	0.001
Watershed No.	18-E	Chapter 93 Class.	HQ-CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	Final	Name	Kiskiminetas-Conemaugh River Watersheds TMDL

Nearest Downstream Public Water Supply Intake	Saltsburg Municipal Waterworks		
PWS Waters	Conemaugh River	Flow at Intake (cfs)	124
PWS RMI	0.72	Distance from Outfall (mi)	72

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 6.0
Latitude 40º 19' 15.00" **Longitude** -78º 39' 47.00"
Wastewater Description: IW Process Effluent without ELG

Technology-Based Limitations

The Beaverdam Water Treatment Plant is not subject to Federal Effluent Limitation Guidelines (ELGs) as the SIC code is not listed under 40 CFR parts 405 through 471.

Regulatory Effluent Standards and Monitoring Requirements

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1) which is displayed in Table 1 below.

Effluent standards for pH are also imposed on industrial wastes by 25 Pa. Code §§ 95.2(1) which is displayed in Table 1 below.

Pennsylvania regulations at 25 Pa. Code § 92a.48(b) require the imposition of technology-based TRC limits for facilities that use chlorination and that are not already subject to TRC limits based on applicable federal ELGs or a facility-specific BPJ evaluation which is displayed in Table 1 below.

Table 1. Regulatory Effluent Standards

Parameter	Monthly Avg	Daily Max	IMAX
Flow (MGD)	Monitor	Monitor	----
pH (S.U.)	6.0 – 9.0 at all times		----
TRC (mg/L)	0.5	----	1.6

Best Practicable Control Technology Currently Achievable (BPT)

BPT for wastewater from treatment of WTP sludges and filter backwash is found in DEPs Technology-Based Control Requirements for Water Treatment Plant Wastes Document which falls under Best Professional Judgement under 40 CFR § 125.3 and the limits imposed are displayed in Table 2 below.

Table 2. BPT Limits for WTP sludge and filter backwash wastewater

Parameter	Monthly Avg (mg/l)	Daily Max (mg/l)
Suspended solids	30.0	60.0
Iron (total)	2.0	4.0
Aluminum (total)	4.0	8.0
Manganese (total)	1.0	2.0
Flow (MGD)	Monitor	----
pH (S.U.)	6.0 – 9.0 at all times	
Total Residual Chlorine	0.5	1.0

Water Quality-Based Limitations

Toxics Management Spread Sheet

The Department of Environmental Protection (DEP) has developed the DEP Toxics Management Spreadsheet (“TMS”) to facilitate calculations necessary for completing a reasonable potential (RP) analysis and determining water quality-based effluent limitations for discharges of toxic pollutants. The Toxics Management Spreadsheet is a macro-enabled Excel binary file that combines the functions of the PENTOXSD model and the Toxics Screening Analysis spreadsheet to evaluate the reasonable potential for discharges to cause excursions above water quality standards and to determine WQBELs. The Toxics Management Spread Sheet is a single discharge, mass-balance water quality calculation spread sheet that includes consideration for mixing, first-order decay and other factors to determine recommended WQBELs for

toxic substances and several non-toxic substances. Required input data including stream code, river mile index, elevation, drainage area, discharge name, NPDES permit number, discharge flow rate and the discharge concentrations for parameters in the permit application or in DMRs, which are entered into the spread sheet to establish site-specific discharge conditions. Other data such as low flow yield, reach dimensions and partial mix factors may also be entered to further characterize the conditions of the discharge and receiving water. Discharge concentrations for the parameters are chosen to represent the "worst case" quality of the discharge (i.e., maximum reported discharge concentrations). The spread sheet then evaluates each parameter by computing a Waste Load Allocation for each applicable criterion, determining a recommended maximum WQBEL and comparing that recommended WQBEL with the input discharge concentration to determine which is more stringent. Based on this evaluation, the Toxics Management Spread sheet recommends average monthly and maximum daily WQBELs.

Reasonable Potential Analysis and WQBEL Development for Outfall 001

Discharges from Outfall 001 are evaluated based on concentrations reported on the application and on DMRs; data from those sources are entered into the Toxics Management Spread Sheet. The maximum reported value of the parameters from the application form or from previous DMRs is used as the input concentration in the Toxics Management Spread Sheet. All toxic pollutants whose maximum concentrations, as reported in the permit application or on DMRs, are greater than the most stringent applicable water quality criterion are considered to be pollutants of concern. [This includes pollutants reported as "Not Detectable" or as "<MDL" where the method detection limit for the analytical method used by the applicant is greater than the most stringent water quality criterion]. The Toxics Management Spread Sheet is run with the discharge and receiving stream characteristics shown in Table 3. For IW discharges, the design flow used in modeling is the average flow during production or operation taken from the permit application. Pollutants for which water quality standards have not been promulgated (e.g., TSS, oil and grease) are excluded from the analysis. All the parameters are evaluated using the model to determine the water quality-based effluent limits applicable to the discharge and the receiving stream. The spreadsheet then compares the reported discharge concentrations to the calculated water quality-based effluent limitations to determine if a reasonable potential exists to exceed the calculated WQBELs. Effluent limitations are established in the draft permit where a pollutant's maximum reported discharge concentration equals or exceeds 50% of the WQBEL. For non-conservative pollutants, monitoring requirements are established where the maximum reported concentration is between 25% - 50% of the WQBEL. For conservative pollutants, monitoring requirements are established where the maximum reported concentration is between 10% - 50% of the WQBEL. The information described above including the maximum reported discharge concentrations, the most stringent water quality criteria, the pollutant-of-concern (reasonable potential) determinations, the calculated WQBELs, and the WQBEL/monitoring recommendations are displayed in the Toxics Management Spread Sheet in Attachment B of this Fact Sheet. The water quality-based effluent limitations and monitoring requirements that are recommended by the Toxics Management Spread Sheet are displayed below in Table 4. The discharge concentrations used in the modeling are also included in Table 4.

Table 3: TMS Inputs for Outfall 001

Parameter	**Value**
River Mile Index	0.75
Discharge Flow (MGD)	0.17
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	6.39
$Q_{7\text{-}10}$ (cfs)	0.515
Low-flow yield (cfs/mi^2)	0.085
Elevation (ft)	2324
Slope	0.001

Table 4: Water Quality Base Effluent Limitations at Outfall 001

Parameters	**Average Monthly**	**Daily Maximum**	**Discharge Concentration used in modeling**
Chloride (mg/L)	Report	Report	5.27
Sulfate (mg/L)	Report	Report	4.02
Total Cadmium (µg/L)	0.69	1.07	5.0
Total Copper (µg/L)	21.6	33.7	12.5
Total Selenium (µg/L)	15.3	23.9	12.5
Total Silver (µg/L)	4.77	7.44	2.5
Total Thallium (µg/L)	0.74	1.15	0.5

Total Residual Chlorine

To determine if WQBELs are required for discharges containing total residual chlorine (TRC), a discharge evaluation is performed using a DEP program called TRC_CALC created with Microsoft Excel for Windows. TRC_CALC calculates TRC Waste Load Allocations (WLAs) through the application of a mass balance model which considers TRC losses due to stream and discharge chlorine demands and first-order chlorine decay. Input values for the program include flow rates and chlorine demands for the receiving stream and the discharge, the number of samples taken per month, coefficients of TRC variability, partial mix factors, and an optional factor of safety. The mass balance model calculates WLAs for acute and chronic criteria that are then converted to long term averages using calculated multipliers. The multipliers are functions of the number of samples taken per month and the TRC variability coefficients (normally kept at default values unless site specific information is available). The most stringent limitation between the acute and chronic long-term averages is converted to an average monthly limit for comparison to the BAT average monthly limit of 0.5 mg/l from 25 Pa. Code § 92a.48(b)(2). The more stringent of these average monthly TRC limitations is imposed in the permit. The results of the modeling, included in Attachment C, indicate that WQBELs are required for TRC at 0.434 mg/L average monthly and 1.015 mg/L daily maximum.

Total Maximum Daily Loads

Wastewater discharges from the Beaverdam Water Treatment Plant are located within the Kiskiminetas-Conemaugh River Watersheds for which the Department has developed a TMDL. The TMDL was finalized on January 29, 2010 and establishes waste load allocations for the discharge of aluminum, iron and manganese within the Kiskiminetas-Conemaugh River Watersheds. Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency's Water Quality Planning and Management Regulations (codified at Title 40 of the *Code of Federal Regulations* Part 130) require states to develop a TMDL for impaired water bodies. A TMDL establishes the amount of a pollutant that a water body can assimilate without exceeding the water quality criteria for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and non-point sources in order to restore and maintain the quality of the state's water resources (USEPA 1991a). Stream reaches within the Kiskiminetas-Conemaugh River Watersheds are included in the state's 2008 Section 303(d) list because of various impairments, including metals, pH and sediment. The TMDL includes consideration for each river and tributary within the target watershed and its impairment sources. Stream data is then used to calculate minimum pollutant reductions that are necessary to attain water quality criteria levels. Target concentrations published in the TMDL were based on established water quality criteria of 0.750 $^{mg}/_{L}$ total recoverable aluminum, 1.5 $^{mg}/_{L}$ total recoverable iron based on a 30-day average and 1.0 $^{mg}/_{L}$ total recoverable manganese. The reduction needed to meet the minimum water quality standards is then divided between each known point and non-point pollutant source in the form of a watershed allocation. TMDLs prescribe allocations that minimally achieve water quality criteria (i.e., 100 percent use of a stream's assimilative capacity). The Beaverdam WTP's NPDES permit, (PA0097756), is listed in the Appendix G of the Kiskiminetas-Conemaugh River Watersheds TMDL and received waste load allocations for Outfall 001 and are displayed below in Table 5.

The specific water quality criterion for aluminum is expressed as an acute or maximum daily in 25 Pa. Code Chapter 93. Discharges of aluminum may only be authorized to the extent that they will not cause or contribute to any violation of the water quality standards. Therefore, the water quality criterion for aluminum (0.75 mg/L) is imposed as a maximum daily effluent limit (MDL). Whenever the most stringent criterion is selected for the MDL, the Department should also impose an average monthly limit (AML) and instantaneous maximum limit (IMAX) if applicable. The imposition of an AML that is more stringent than the MDL is typically not appropriate because the water quality concerns have already been fully addressed by setting the MDL equal to the most stringent applicable criterion. Therefore, where the MDL is set at the value of the most stringent applicable criterion, the AML should be set equal to the MDL.

The specific water quality criterion for iron is expressed as a 30-day average of 1.5 $^{mg}/_{L}$ in 25 Pa. Code § 93.7(a). The criterion is based on the protection of aquatic life and is associated with chronic exposure. There are no other criteria for total iron. Since the duration of the total iron criterion coincides with the 30-day duration of the AML, the 30-day average criterion for total iron is set equal to the AML. In addition, because the total iron criterion is associated with chronic exposure, the MDL (representing acute exposure) and the IMAX may be made less stringent according to established procedures described in Section III.C.3.h on Page 13 of the Water Quality Toxics Management Strategy (Doc. # 361-0100-003). These procedures state that an MDL and IMAX may be set at 2 times and 2.5 times the AML, respectively, or there is the option to use multipliers from EPA's Technical Support Document for Water Quality-based Toxics Control, if data are available to support the use of alternative multipliers.

The specific water quality criterion for manganese is expressed as an acute or maximum daily of 1.0 mg/L in 25 Pa. Code § 93.7(a). The criterion is based on the protection of human health and is associated with chronic exposure associated with a potable water supply (PWS). Since no duration is given in Chapter 93 for the manganese criterion, a duration of 30

days is used based on the water quality criteria duration for Threshold Human Health (THH) criteria given in Section III.C.3.a., Table 1 on Page 10 of DEP's Water Quality Toxics Management Strategy. The 30-day duration for THH criteria coincides with the 30-day duration of an AML, which is why the manganese criterion is set equal to the AML for a "permitting at criteria" scenario. Because the manganese criterion is interpreted as having chronic exposure, the manganese MDL and IMAX may be made less stringent according to procedures established in Section III.C.2.h. of the Water Quality Toxics Management Strategy (AML multipliers of 2.0 and 2.5 for the MDL and IMAX respectively).

Table 5 – TMDL Limits for Outfall 001

Parameter	TMDL Limits		Units
	Average Monthly	Maximum Daily	
Aluminum, total	0.75	0.75	mg/L
Iron, total	1.5	3.0	mg/L
Manganese, total	1.00	2.00	mg/L

Anti-Backsliding

Previous limits can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l). The limits below in Table 6 are from the current permit. The parameters listed are from the Department's Technical Support Document (TSD) "Development of Technology-Based Control Requirements for Water Treatment Plant Wastes in Pennsylvania".

Table 6: Current Permit Effluent Limits

Parameters	Mass (lb/day)		Concentration (mg/l)			
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX
Total Suspended Solids	XXX	XXX	XXX	30	XXX	60
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.0
Total Aluminum	XXX	XXX	XXX	0.7	XXX	1.4
Total Iron	XXX	XXX	XXX	2.0	XXX	4.0
Total Manganese	XXX	XXX	XXX	1.0	XXX	2.0
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0

Proposed Effluent Limitations for Outfall 001

The proposed effluent limitations and monitoring requirements for Outfall 001 are shown below in Table 7. Note that some values were incorrectly labeled as IMAX values in the previous permit when they should have been label as Daily Max, this has been changed to reflect existing permitting practices. The monitoring frequency will remain the same as the current permit, twice per month. Outfall 001 received new WQBELs for total iron, total cadmium, total copper, total selenium, total silver, and total thallium. The permittee may not have the necessary controls in place to ensure compliance with the new WQBELs upon permit issuance; therefore, the permit will include a Schedule of Compliance, in accordance with 25 Pa. Code § 92a.51(a) of DEP's regulations, which grants the permittee three years to come into compliance with the new WQBELs. Because the WQBELs will not be effective upon permit issuance, the permit will be tiered to have interim and final monitoring requirements and effluent limits. For the first three years, a reporting requirement will be imposed for total cadmium, total copper, total selenium, total silver, and total thallium, and the limits in the previous permit will be imposed for total iron. After three years, the WQBELs will take effect. A Part C condition will be included in the Draft NPDES Permit outlining a compliance schedule for these parameters. The Part C condition also contains requirements for the permittee to conduct a Site-Specific Data Collection Study and a Toxics Reduction Evaluation (TRE) because of the new WQBELs.

Table 7: Proposed Final Effluent Limitation for Outfall 001

Parameters	Mass (lb/day)		Concentration				Monitoring Requirements	
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	2/Month	Measured
Total Suspended Solids (mg/L)	XXX	XXX	XXX	30.0	60.0	XXX	2/Month	Grab
Total Residual Chlorine (mg/L)	XXX	XXX	XXX	0.43	1.0	XXX	2/Month	Grab
Total Aluminum (mg/L)	XXX	XXX	XXX	0.7	0.75	XXX	2/Month	Grab
Total Iron (mg/L)	XXX	XXX	XXX	1.5	3.0	XXX	2/Month	Grab
Total Manganese (mg/L)	XXX	XXX	XXX	1.0	2.0	XXX	2/Month	Grab
Chloride	XXX	XXX	XXX	Report	Report	XXX	2/Month	Grab
Sulfate	XXX	XXX	XXX	Report	Report	XXX	2/Month	Grab
Total Cadmium (µg/L)	XXX	XXX	XXX	0.69	1.07	XXX	2/Month	Grab
Total Copper (µg/L)	XXX	XXX	XXX	21.6	33.7	XXX	2/Month	Grab
Total Selenium (µg/L)	XXX	XXX	XXX	15.3	23.9	XXX	2/Month	Grab
Total Silver (µg/L)	XXX	XXX	XXX	4.77	7.44	XXX	2/Month	Grab
Total Thallium (µg/L)	XXX	XXX	XXX	0.74	1.15	XXX	2/Month	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	2/Month	Grab

Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☐	PENTOXSD for Windows Model (see Attachment)
☒	TRC Model Spreadsheet (see Attachment **C**)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Toxics Screening Analysis Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☒	Toxic Management Spreadsheet (see Attachment **B**)

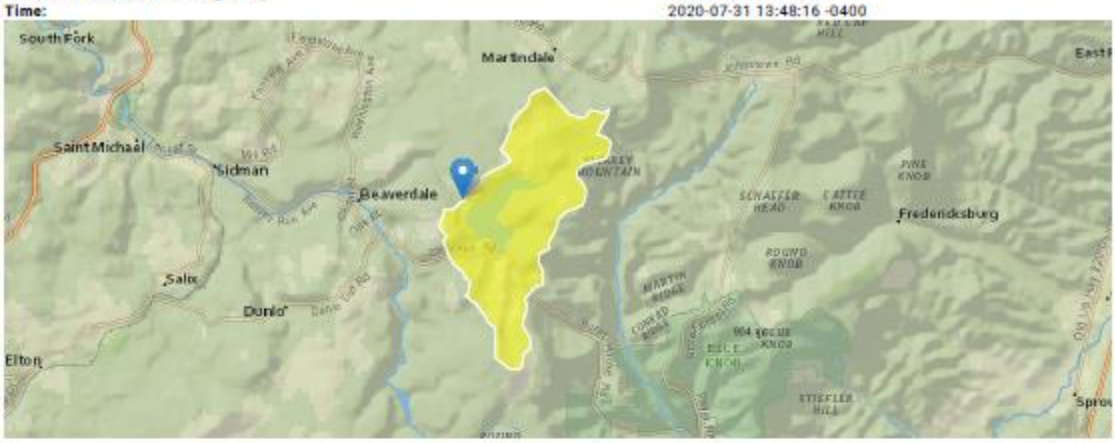
Attachments

Attachment A: StreamStats Drainage Area
Attachment B: Toxics Management Analysis
Attachment C: TRC Evaluation Model

Attachment A:
StreamStats Drainage Area

StreamStats Report

Region ID:	PA
Workspace ID:	PA20200731174759440000
Clicked Point (Latitude, Longitude):	40.32132, -78.66268
Time:	2020-07-31 13:48:16 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	6.39	square miles
ELEV	Mean Basin Elevation	2505.3	feet
PRECIP	Mean Annual Precipitation	46	inches

Low-Flow Statistics Parameters

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	6.39	square miles	2.33	1720
ELEV	Mean Basin Elevation	2505.3	feet	898	2700
PRECIP	Mean Annual Precipitation	46	inches	38.7	47.9

Low-Flow Statistics Flow Report

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	1.12	ft^3/s	43	43
30 Day 2 Year Low Flow	1.58	ft^3/s	38	38
7 Day 10 Year Low Flow	0.545	ft^3/s	54	54
30 Day 10 Year Low Flow	0.695	ft^3/s	49	49
90 Day 10 Year Low Flow	1	ft^3/s	41	41

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Attachment B:
Toxic Management Analysis

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.0, July 2020

Discharge Information

Instructions | Discharge | Stream

Facility: **Beaverdam WTP** NPDES Permit No.: **PA0097756** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Sludge and Filter Backwash**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.17	29.8	7						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		56									
	Chloride (PWS)	mg/L		5.27									
	Bromide	mg/L		0.4									
	Sulfate (PWS)	mg/L		4.02									
	Fluoride (PWS)	mg/L		2									
Group 2	Total Aluminum	µg/L		100									
	Total Antimony	µg/L		1									
	Total Arsenic	µg/L	<	0.0015									
	Total Barium	µg/L		12.5									
	Total Beryllium	µg/L		2.5									
	Total Boron	µg/L	<	0.1									
	Total Cadmium	µg/L		5									
	Total Chromium (III)	µg/L		2.5									
	Hexavalent Chromium	µg/L	<	0.00025									
	Total Cobalt	µg/L		2									
	Total Copper	µg/L		12.5									
	Free Available Cyanide	µg/L											
	Total Cyanide	µg/L	<	0.01									
	Dissolved Iron	µg/L		50									
	Total Iron	µg/L		89.9									
	Total Lead	µg/L	<	0.5									
	Total Manganese	µg/L		2.5									
	Total Mercury	µg/L	<	0.0002									
	Total Nickel	µg/L	<	2.5									
	Total Phenols (Phenolics) (PWS)	µg/L	<	0.005									
	Total Selenium	µg/L		12.5									
	Total Silver	µg/L		2.5									
	Total Thallium	µg/L		0.5									
	Total Zinc	µg/L		12.5									
	Total Molybdenum	µg/L		0.5									
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

Group 3	Carbon Tetrachloride	µg/L	<										
	Chlorobenzene	µg/L	<										
	Chlorodibromomethane	µg/L	<										
	Chloroethane	µg/L	<										
	2-Chloroethyl Vinyl Ether	µg/L	<										
	Chloroform	µg/L	<										
	Dichlorobromomethane	µg/L	<										
	1,1-Dichloroethane	µg/L	<										
	1,2-Dichloroethane	µg/L	<										
	1,1-Dichloroethylene	µg/L	<										
	1,2-Dichloropropane	µg/L	<										
	1,3-Dichloropropylene	µg/L	<										
	1,4-Dioxane	µg/L	<										
	Ethylbenzene	µg/L	<										
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L	<										
	1,1,2,2-Tetrachloroethane	µg/L	<										
	Tetrachloroethylene	µg/L	<										
	Toluene	µg/L	<										
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L	<										
	1,1,2-Trichloroethane	µg/L	<										
	Trichloroethylene	µg/L	<										
	Vinyl Chloride	µg/L	<										
Group 4	2-Chlorophenol	µg/L	<										
	2,4-Dichlorophenol	µg/L	<										
	2,4-Dimethylphenol	µg/L	<										
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<										
	2-Nitrophenol	µg/L	<										
	4-Nitrophenol	µg/L	<										
	p-Chloro-m-Cresol	µg/L	<										
	Pentachlorophenol	µg/L	<										
	Phenol	µg/L	<										
	2,4,6-Trichlorophenol	µg/L	<										
Group 5	Acenaphthene	µg/L	<										
	Acenaphthylene	µg/L	<										
	Anthracene	µg/L	<										
	Benzidine	µg/L	<										
	Benzo(a)Anthracene	µg/L	<										
	Benzo(a)Pyrene	µg/L	<										
	3,4-Benzofluoranthene	µg/L	<										
	Benzo(ghi)Perylene	µg/L	<										
	Benzo(k)Fluoranthene	µg/L	<										
	Bis(2-Chloroethoxy)Methane	µg/L	<										
	Bis(2-Chloroethyl)Ether	µg/L	<										
	Bis(2-Chloroisopropyl)Ether	µg/L	<										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<										
	4-Bromophenyl Phenyl Ether	µg/L	<										
	Butyl Benzyl Phthalate	µg/L	<										
	2-Chloronaphthalene	µg/L	<										
	4-Chlorophenyl Phenyl Ether	µg/L	<										
	Chrysene	µg/L	<										
	Dibenzo(a,h)Anthrancene	µg/L	<										
	1,2-Dichlorobenzene	µg/L	<										
	1,3-Dichlorobenzene	µg/L	<										
	1,4-Dichlorobenzene	µg/L	<										
	3,3-Dichlorobenzidine	µg/L	<										
	Diethyl Phthalate	µg/L	<										
	Dimethyl Phthalate	µg/L	<										
	Di-n-Butyl Phthalate	µg/L	<										
	2,4-Dinitrotoluene	µg/L	<										

	2,6-Dinitrotoluene	µg/L	<										
	Di-n-Octyl Phthalate	µg/L	<										
	1,2-Diphenylhydrazine	µg/L	<										
	Fluoranthene	µg/L	<										
	Fluorene	µg/L	<										
	Hexachlorobenzene	µg/L	<										
	Hexachlorobutadiene	µg/L	<										
	Hexachlorocyclopentadiene	µg/L	<										
	Hexachloroethane	µg/L	<										
	Indeno(1,2,3-cd)Pyrene	µg/L	<										
	Isophorone	µg/L	<										
	Naphthalene	µg/L	<										
	Nitrobenzene	µg/L	<										
	n-Nitrosodimethylamine	µg/L	<										
	n-Nitrosodi-n-Propylamine	µg/L	<										
	n-Nitrosodiphenylamine	µg/L	<										
	Phenanthrene	µg/L	<										
	Pyrene	µg/L	<										
	1,2,4-Trichlorobenzene	µg/L	<										
Group 6	Aldrin	µg/L	<										
	alpha-BHC	µg/L	<										
	beta-BHC	µg/L	<										
	gamma-BHC	µg/L	<										
	delta BHC	µg/L	<										
	Chlordane	µg/L	<										
	4,4-DDT	µg/L	<										
	4,4-DDE	µg/L	<										
	4,4-DDD	µg/L	<										
	Dieldrin	µg/L	<										
	alpha-Endosulfan	µg/L	<										
	beta-Endosulfan	µg/L	<										
	Endosulfan Sulfate	µg/L	<										
	Endrin	µg/L	<										
	Endrin Aldehyde	µg/L	<										
	Heptachlor	µg/L	<										
	Heptachlor Epoxide	µg/L	<										
	PCB-1016	µg/L	<										
	PCB-1221	µg/L	<										
	PCB-1232	µg/L	<										
	PCB-1242	µg/L	<										
	PCB-1248	µg/L	<										
	PCB-1254	µg/L	<										
	PCB-1260	µg/L	<										
	PCBs, Total	µg/L	<										
	Toxaphene	µg/L	<										
	2,3,7,8-TCDD	ng/L	<										
Group 7	Gross Alpha	pCi/L											
	Total Beta	pCi/L	<										
	Radium 226/228	pCi/L	<										
	Total Strontium	µg/L	<										
	Total Uranium	µg/L	<										
	Osmotic Pressure	mOs/kg											

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.0, July 2020

Stream / Surface Water Information

Beaverdam WTP, NPDES Permit No. PA0097756, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: Beaverdam Run

No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	045917	0.75	2324	6.39	0.001		Yes
End of Reach 1	045917	0.1	2300	6.4	0.001		Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	0.75	0.1	0.545									100	7		
End of Reach 1	0.1	0.1	0.545												

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	0.75														
End of Reach 1	0.1														

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Toxics Management Spreadsheet
Version 1.0, July 2020

Model Results

Beaverdam WTP, NPDES Permit No. PA0097756, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ○ All | ◉ Inputs | ○ Results | ○ Limits

☑ ***Hydrodynamics***

$Q_{7\text{-}10}$

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
0.75	0.55		0.55	0.263	0.001	0.516	14.431	27.959	0.108	0.366	11.075
0.1	0.55		0.545								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
0.75	4.37		4.37	0.263	0.001	1.113	14.431	12.964	0.288	0.138	6.838
0.1	4.371		4.37								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 11.075 PMF: 1 Analysis Hardness (mg/l): 77.151 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	2,304	
Total Antimony	0	0		0	1,100	1,100	3,380	
Total Arsenic	0	0		0	340	340	1,045	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	64,519	
Total Boron	0	0		0	8,100	8,100	24,886	
Total Cadmium	0	0		0	1.565	1.64	5.03	Chem Translator of 0.955 applied
Total Chromium (III)	0	0		0	460.709	1,458	4,479	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	50.1	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	292	
Total Copper	0	0		0	10.525	11.0	33.7	Chem Translator of 0.96 applied

Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	48.637	58.7	180	Chem Translator of 0.829 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	5.06	Chem Translator of 0.85 applied
Total Nickel	0	0		0	375.971	377	1,157	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	2.059	2.42	7.44	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	200	
Total Zinc	0	0		0	94.059	96.2	295	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 11.075 PMF: 1 Analysis Hardness (mg/l): 77.151 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	676	
Total Arsenic	0	0		0	150	150	461	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	12,597	
Total Boron	0	0		0	1,600	1,600	4,916	
Total Cadmium	0	0		0	0.205	0.22	0.69	Chem Translator of 0.92 applied
Total Chromium (III)	0	0		0	59.929	69.7	214	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	31.9	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	58.4	
Total Copper	0	0		0	7.175	7.47	23.0	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	4,608	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	1.895	2.29	7.03	Chem Translator of 0.829 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	2.78	Chem Translator of 0.85 applied
Total Nickel	0	0		0	41.759	41.9	129	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	15.3	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	39.9	
Total Zinc	0	0		0	94.828	96.2	295	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 11.075 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments

Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Fluoride (PWS)	0	0		0	2,000	2,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	17.2	
Total Arsenic	0	0		0	10	10.0	30.7	
Total Barium	0	0		0	2,400	2,400	7,374	
Total Boron	0	0		0	3,100	3,100	9,524	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	300	300	922	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	3,072	
Total Mercury	0	0		0	0.050	0.05	0.15	
Total Nickel	0	0		0	610	610	1,874	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	0.74	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ *CRL* CCT (min): 6.838 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	

Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Chloride (PWS)	Report	Report	Report	Report	Report	mg/L	N/A	N/A	Discharge Conc > 10% WQBEL (no RP)
Sulfate (PWS)	Report	Report	Report	Report	Report	mg/L	N/A	N/A	Discharge Conc > 10% WQBEL (no RP)
Total Cadmium	0.001	0.002	0.69	1.07	1.72	µg/L	0.69	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Copper	0.031	0.048	21.6	33.7	54.0	µg/L	21.6	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Selenium	0.022	0.034	15.3	23.9	38.3	µg/L	15.3	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Silver	0.007	0.011	4.77	7.44	11.9	µg/L	4.77	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Thallium	0.001	0.002	0.74	1.15	1.84	µg/L	0.74	THH	Discharge Conc ≥ 50% WQBEL (RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Fluoride (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	1,477	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	17.2	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Beryllium	N/A	N/A	No WQS
Total Boron	N/A	N/A	Discharge Conc < TQL
Total Cobalt	58.4	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	31.9	µg/L	Discharge Conc < TQL
Dissolved Iron	922	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	4,608	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS

Total Lead	7.03	µg/L	Discharge Conc < TQL
Total Mercury	0.15	µg/L	Discharge Conc < TQL
Total Nickel	129	µg/L	Discharge Conc < TQL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS

Attachment C:
TRC Evaluation Model

TRC EVALUATION

0.545	**= Q stream (cfs)**	**0.5**	**= CV Daily**
0.17	**= Q discharge (MGD)**	**0.5**	**= CV Hourly**
4	**= no. samples**	**0.995**	**= AFC_Partial Mix Factor**
0.3	**= Chlorine Demand of Stream**	**1**	**= CFC_Partial Mix Factor**
0	**= Chlorine Demand of Discharge**	**15**	**= AFC_Criteria Compliance Time (min)**
0.5	**= BAT/BPJ Value**	**720**	**= CFC_Criteria Compliance Time (min)**
	= %Factor of Safety (FOS)		**=Decay Coefficient (K)**

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	**1.3.2.iii**	WLA afc =	0.677	**1.3.2.iii**	WLA cfc =	0.655
PENTOXSD TRG	**5.1a**	LTAMULT afc =	0.373	**5.1c**	LTAMULT cfc =	0.581
PENTOXSD TRG	**5.1b**	LTA_afc=	0.252	**5.1d**	LTA_cfc =	0.381

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.720	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.434	AFC
		INST MAX LIMIT (mg/l) =	1.015	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...**
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...**
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**