pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0000272**
Facility Type	**Industrial**	APS ID	**1061490**
Major / Minor	**Minor**	Authorization ID	**1392803**

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

Applicant and Facility Information

Applicant Name	**PA American Water Co.**	Facility Name	**E. H. Aldrich Water Treatment Facility**
Applicant Address	1 Water St.	Facility Address	60 Elrama Avenue
	Camden, NJ 08105		Elrama, PA 15038-1008
Applicant Contact	Ryan Hardgrove	Facility Contact	Tim Patterson
Applicant Phone	(412) 690-5436	Facility Phone	(412) 334-3700
Client ID	87712	Site ID	261435
SIC Code	4941	Municipality	Union Township
SIC Description	Trans. & Utilities - Water Supply	County	Washington
Date Application Received	April 19, 2022	EPA Waived?	Yes
Date Application Accepted	May 10, 2022	If No, Reason	

Purpose of Application: Renewal NPDES permit application to discharge water treatment plant filter backwash water

Summary of Review

The Department received a timely renewal NPDES permit application from PA American Water Co. for their E.H. Aldrich Water Treatment facility located in Union Township of Washington County on April 19, 2022. The facility is a potable public water treatment plant with an SIC code of 4941.

The E. H. Aldrich Water Treatment Facility purifies water withdrawn from the Monongahela River for potable public consumption. This facility removes naturally occurring sediment from the Monongahela River during the treatment process with an up-flow clarification process and conventional filtration. The filters are backwashed to remove trapped solids and particles on a daily basis. This backwash water is sent to a wastewater clarifier. The sludge from the wastewater clarifier is sent to two lagoons. The lagoons are used as gravity thickeners and are used one at a time. If the clarifier is taken out of service, the filter backwash is discharged directly to the sludge lagoons. The supernatant water from the clarifier and the sludge lagoons are discharged via Outfall 001 to the Monongahela River, designated in the 25 PA Code Chapter 93 as a Warm Water Fishery.

A second waste clarifier has been designed and the construction phase is set to start during May 2022 and is set to be complete some time in 2023. The second clarifier will have similar dimensions, design flow, and capacity to the first waste clarifier. The second clarifier is being installed for the purpose of redundancy. The second clarifier has been approved by the Department under Water Quality Management Permit 467I005T2-A3.

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-

Approve	Deny	Signatures	Date
X		Adam Olesnanik / Project Manager	5/11/2022
X		Michael E. Fifth, P.E. / Environmental Engineer Manager	5/13/2022

Summary of Review
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)	0.601
Latitude	40º 14' 58"	Longitude	-79º 55' 11"
Quad Name	Monongahela	Quad Code	1706
Wastewater Description:	Water Treatment Effluent		

Receiving Waters	Monongahela River	Stream Code	37185
NHD Com ID	134839806	RMI	25.3
Drainage Area	5330	Yield (cfs/mi^2)	0.103
Q_{7-10} Flow (cfs)	550	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	727	Slope (ft/ft)	0.0001
Watershed No.	19-C	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	PCB		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Monongahela River TMDL

Nearest Downstream Public Water Supply Intake	PA American Water Co. – Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1230
PWS RMI	4.6	Distance from Outfall (mi)	20.85

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.601
Latitude 40º 14' 58.00" **Longitude** -79º 55' 11.00"
Wastewater Description: Water Treatment Effluent

Technology-Based Effluent limitations:

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	Monitor	Monitor	----
pH	6-9 at all times		----
TRC	0.5 mg/l	----	1.6 mg/l

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	Monitor	----
pH	6-9 at all times	
Total Residual Chlorine	0.5	1.0

Water Quality-Based Effluent 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 C of this Fact Sheet. The Toxics Management Spread Sheet did not recommend any WQBELs for Outfall 001.

Table 3: TMS Inputs for Outfall 001

Parameter	**Value**
River Mile Index	25.3
Discharge Flow (MGD)	0.944
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	5330
Q_{7-10} (cfs)	550
Low-flow yield (cfs/mi^2)	0.103
Elevation (ft)	727
Slope	0.0001

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 D, indicate that no WQBELs are required for TRC.

Total Maximum Daily Loads

The Monongahela River has a TMDL for PCBs and Chlordane. The TMDL outlines a plan to achieve water quality standards in the water body. The TMDL applies only to discharges of PCBs and chlordane to the Monongahela River and does not provide waste load allocations for either. The TMDL goal is for levels of PCB and chlordane in the water column to be equal to or less than the Commonwealth's water quality criteria. The production and use of PCB in the United States was banned in July of 1979. In addition, the TMDL acknowledges that there are no longer any known point sources of either pollutant in the watershed and the TMDL is expected to achieve implementation through "natural attenuation". While it is now illegal to manufacture, distribute, or use PCBs in the United states, these synthetic oils were used in the past. However, this site has not been shown to have PCBs in its discharge and has not been known to use PCBs. Neither chlordane nor PCB's are used, generated, or stored at the site; nor is there any evidence to suggest that PCBs and chlordane were ever used, generated, or stored onsite in the past. Based upon these considerations, the Monongahela River TMDL is not applicable to site's discharges.

Anti-Backsliding

Previous limits can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l). The previous limitations for Outfall 001 are displayed below in Table 4.

Table 4: Current Effluent Limitation at Outfall 001

Parameters	Mass (lb/day)		Concentration (mg/L)				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	Metered
Total Suspended Solids	XXX	XXX	XXX	30.0	60.0	XXX	2/Month	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	1.0	1.6	2/Month	Grab
Total Aluminum	XXX	XXX	XXX	4.0	8.0	XXX	2/Month	Grab
Total Iron	XXX	XXX	XXX	2.0	4.0	XXX	2/Month	Grab
Total Manganese	XXX	XXX	XXX	1.0	2.0	XXX	2/Month	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	2/Month	Grab

Final Effluent Limitations

The proposed effluent limitations and monitoring requirements for Outfall 001 are shown below in Table 5. The limits are the most stringent values from the above limitation analysis.

Table 4: Proposed Effluent Limitation at Outfall 001

Parameters	Mass (lb/day)		Concentration (mg/L)				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	Metered
Total Suspended Solids	XXX	XXX	XXX	30.0	60.0	XXX	2/Month	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	1.0	1.6	2/Month	Grab
Total Aluminum	XXX	XXX	XXX	4.0	8.0	XXX	2/Month	Grab
Total Iron	XXX	XXX	XXX	2.0	4.0	XXX	2/Month	Grab
Total Manganese	XXX	XXX	XXX	1.0	2.0	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)
☒	Toxics Management Spreadsheet (see Attachment **C**)
☒	TRC Model Spreadsheet (see Attachment **D**)
☐	Temperature Model 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:
☐	Other:

Attachments

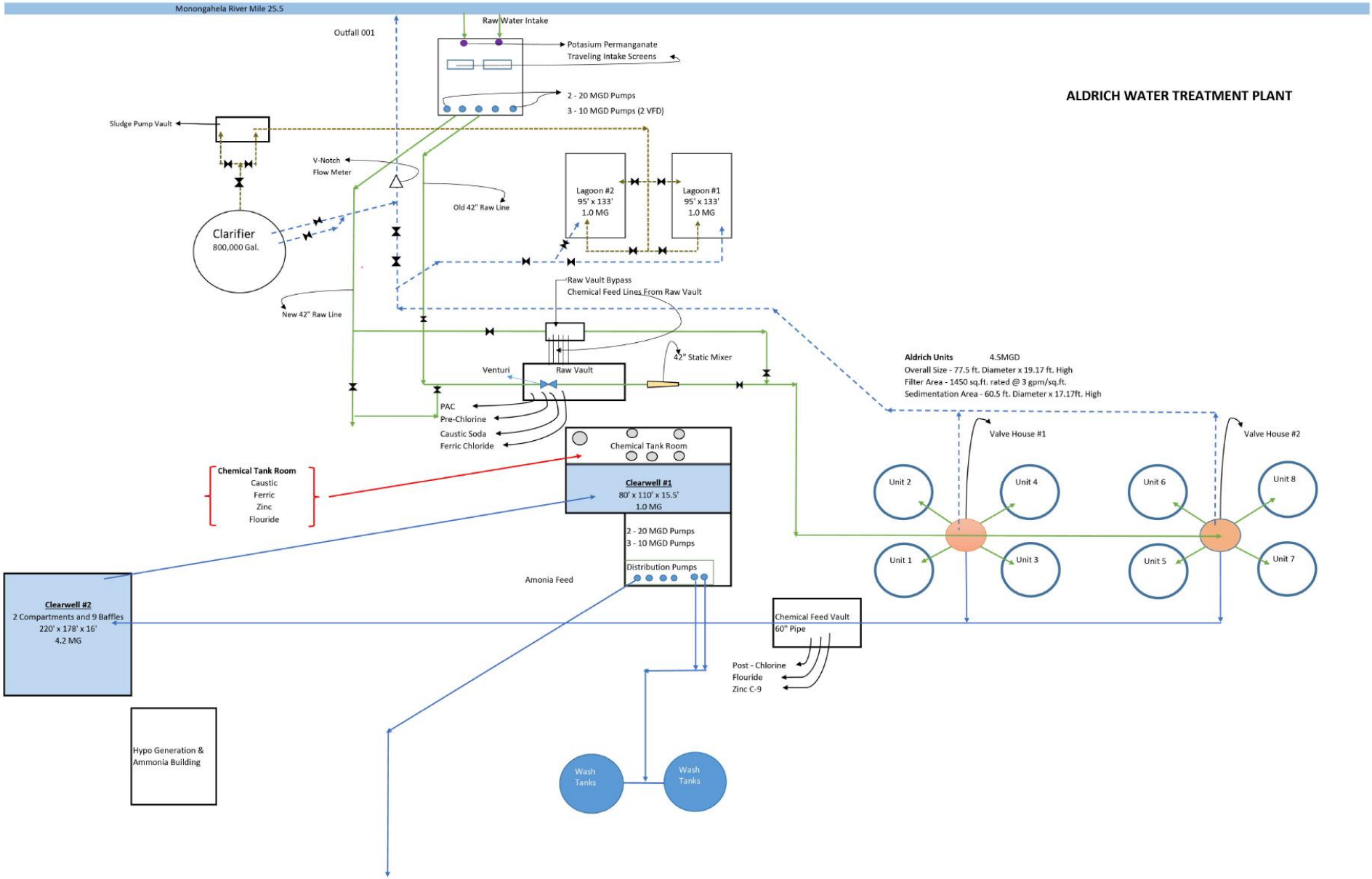
Attachment A: Site Line Diagram

Attachment B: StreamStats Report

Attachment C: Toxic Management Spreadsheet for Outfall 001

Attachment D: TRC Modeling Results for Outfall 001

ATTACHMENT A:
Site Line Diagram


Monongahela River Mile 25.5
Outfall 001
Raw Water Intake
Potasium Permanganate
Traveling Intake Screens
2 - 20 MGD Pumps
3 - 10 MGD Pumps (2 VFD)
ALDRICH WATER TREATMENT PLANT
Sludge Pump Vault
V-Notch
Flow Meter
Old 42" Raw Line
Lagoon #2
95' x 133'
1.0 MG
Lagoon #1
95' x 133'
1.0 MG
Clarifier
800,000 Gal.
Raw Vault Bypass
Chemical Feed Lines From Raw Vault
New 42" Raw Line
42" Static Mixer
Venturi
Raw Vault
PAC
Pre-Chlorine
Caustic Soda
Ferric Chloride
Aldrich Units 4.5MGD
Overall Size - 77.5 ft. Diameter x 19.17 ft. High
Filter Area - 1450 sq.ft. rated @ 3 gpm/sq.ft.
Sedimentation Area - 60.5 ft. Diameter x 17.17ft. High
Valve House #1
Valve House #2
Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
Unit 6
Unit 7
Unit 8
Chemical Tank Room
Caustic
Ferric
Zinc
Flouride
Chemical Tank Room
Clearwell #1
80' x 110' x 15.5'
1.0 MG
2 - 20 MGD Pumps
3 - 10 MGD Pumps
Distribution Pumps
Amonia Feed
Clearwell #2
2 Compartments and 9 Baffles
220' x 178' x 16'
4.2 MG
Chemical Feed Vault
60" Pipe
Post - Chlorine
Flouride
Zinc C-9
Hypo Generation &
Ammonia Building
Wash
Tanks
Wash
Tanks

ATTACHMENT B:
StreamStats Report

StreamStats Report

Region ID: PA
Workspace ID: PA20220511171330157000
Clicked Point (Latitude, Longitude): 40.24864, -79.91882
Time: 2022-05-11 13:13:56 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	5330	square miles
ELEV	Mean Basin Elevation	1825	feet

Low-Flow Statistics Parameters [99.9 Percent (5330 square miles) Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5330	square miles	2.26	1400

ATTACHMENT C:
Toxics Management Spreadsheet for Outfall 001

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Pa American Water - E.H Aldrich Plant** NPDES Permit No.: **PA0000272** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Water Treatment 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
0.944	119	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		256									
	Chloride (PWS)	mg/L		39.2									
	Bromide	mg/L	<	0.1									
	Sulfate (PWS)	mg/L		64.7									
	Fluoride (PWS)	mg/L		0.23									
Group 2	Total Aluminum	µg/L	<	100									
	Total Antimony	µg/L	<	0.5									
	Total Arsenic	µg/L		0.7									
	Total Barium	µg/L		44									
	Total Beryllium	µg/L	<	0.5									
	Total Boron	µg/L		79									
	Total Cadmium	µg/L	<	0.1									
	Total Chromium (III)	µg/L		3									
	Hexavalent Chromium	µg/L		16									
	Total Cobalt	µg/L		1.5									
	Total Copper	µg/L		4.9									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	10									
	Dissolved Iron	µg/L	<	20									
	Total Iron	µg/L		2000									
	Total Lead	µg/L		1.6									
	Total Manganese	µg/L		960									
	Total Mercury	µg/L	<	0.1									
	Total Nickel	µg/L	<	5									
	Total Phenols (Phenolics) (PWS)	µg/L	<	10									
	Total Selenium	µg/L	<	0.5									
	Total Silver	µg/L	<	0.1									
	Total Thallium	µg/L	<	0.1									
	Total Zinc	µg/L		30									
	Total Molybdenum	µg/L	<	10									
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Pa American Water - E.H Aldrich Plant, NPDES Permit No. PA0000272, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Monongahela**

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	037185	25.3	727	5330			Yes
End of Reach 1	037185	24.3	726	5331			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	25.3	0.1	550			12	850					100	7		
End of Reach 1	24.3	0.1	550			12	850								

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	25.3														
End of Reach 1	24.3														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Pa American Water - E.H Aldrich Plant, NPDES Permit No. PA0000272, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.001 PMF: 1 Analysis Hardness (mg/l): 100.05 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	283,213	
Total Antimony	0	0		0	1,100	1,100	415,379	
Total Arsenic	0	0		0	340	340	128,390	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	7,929,965	
Total Boron	0	0		0	8,100	8,100	3,058,701	
Total Cadmium	0	0		0	2.015	2.13	806	Chem Translator of 0.944 applied
Total Chromium (III)	0	0		0	569.998	1,804	681,143	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	6,153	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	35,874	
Total Copper	0	0		0	13.445	14.0	5,289	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	64.617	81.7	30,850	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	622	Chem Translator of 0.85 applied
Total Nickel	0	0		0	468.435	469	177,244	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	3.220	3.79	1,430	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	24,545	
Total Zinc	0	0		0	117.230	120	45,264	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 0.001 PMF: 1 Analysis Hardness (mg/l): 100.05 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	83,076	
Total Arsenic	0	0		0	150	150	56,643	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	1,548,231	
Total Boron	0	0		0	1,600	1,600	604,188	
Total Cadmium	0	0		0	0.246	0.27	102	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	74.145	86.2	32,556	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	3,925	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	7,175	
Total Copper	0	0		0	8.960	9.33	3,524	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	566,426	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.518	3.18	1,202	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	342	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.029	52.2	19,706	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	1,884	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	4,909	
Total Zinc	0	0		0	118.189	120	45,264	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 0.001 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	2,115	
Total Arsenic	0	0		0	10	10.0	3,776	
Total Barium	0	0		0	2,400	2,400	906,282	
Total Boron	0	0		0	3,100	3,100	1,170,614	
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	113,285	
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	377,617	
Total Mercury	0	0		0	0.050	0.05	18.9	
Total Nickel	0	0		0	610	610	230,347	
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	90.6	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 0.000 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

Pollutants	*Mass Limits*		*Concentration Limits*				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			

☑ ***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
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Fluoride (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	181,528	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	3,776	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	906,282	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	604,188	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	102	µg/L	Discharge Conc < TQL
Total Chromium (III)	32,556	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	3,925	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	7,175	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	3,390	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	113,285	µg/L	Discharge Conc < TQL
Total Iron	566,426	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	1,202	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	377,617	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	18.9	µg/L	Discharge Conc < TQL
Total Nickel	19,706	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	1,884	µg/L	Discharge Conc < TQL
Total Silver	917	µg/L	Discharge Conc < TQL
Total Thallium	90.6	µg/L	Discharge Conc < TQL
Total Zinc	29,012	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS

ATTACHMENT D:
TRC Modeling Results for Outfall 001

TRC EVALUATION

550	= Q stream (cfs)	0.5	= CV Daily
0.944	= Q discharge (MGD)	0.5	= CV Hourly
4	= no. samples	0.07	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	0.5	= 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 =	8.429	**1.3.2.iii**	WLA cfc =	58.575
PENTOXSD TRG	**5.1a**	LTAMULT afc =	0.373	**5.1c**	LTAMULT cfc =	0.581
PENTOXSD TRG	**5.1b**	LTA_afc=	3.141	**5.1d**		34.053

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.720	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) =	1.170	

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)**