Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	**NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER**	Application No.	**PA0004073**
Facility Type	**Industrial**		APS ID	**715650**
Major / Minor	**Major**		Authorization ID	**827245**

Applicant and Facility Information

Applicant Name	**United States Steel Corporation**	Facility Name	**Mon Valley Works - Irvin Plant**
Applicant Address	1 Camp Hollow Road	Facility Address	Camp Hollow Road
	West Mifflin, PA 15112		West Mifflin, PA 15122
Applicant Contact	Jonelle Scheetz	Facility Contact	Same as Applicant
Applicant Phone	412-675-7382	Facility Phone	Same as Applicant
Applicant email	JSScheetz@uss.com	Facility email	Same as Applicant
Client ID	80062	Site ID	194251
SIC Code	3312	Municipality	West Mifflin Borough
SIC Description	Manufacturing - Blast Furnaces and Steel Mills	County	Allegheny
Date Application Received	January 28, 2010	EPA Waived?	No
Date Application Accepted	March 16, 2010	If No, Reason	Major Facility

Purpose of Application: Renewal NPDES Permit coverage

Summary of Review

The Department received an NPDES Permit renewal application from United States Steel Corporation for its Mon Valley Works Irvin Plant (Irvin) on January 28, 2010. The site is a steel mill with a SIC code of 3312, Steel Works, Blast Furnaces and Rolling Mills. The site is a steel finishing facility with operations consisting of a hot strip mill, acid pickling, cold forming and galvanizing.

The site has five outfalls that discharge to the Monongahela River, designated in 25 Pa Code Chapter 93 as a Warm Water Fishery. The site also has five internal monitoring points.

Outfall 001 discharges the wastewater from IMP 101, 201, 301, 601, and 701, blowdown from the NCCW recycle system, back-up strainer backwash, emergency overflow, NCCW, Boiler Blowdown, and Stormwater. Outfall 001 previously discharged wastewater via MP 401, which collected and treated the Nickel Terne Line process wastewater. The Nickel Terne Line (Electrolytic Plating Line) has been permanently shut down, therefore, IMP 401 will be removed in this renewal permit. IMP 501 has also been eliminated. IMP 501 was the discharge from the Hot Strip Mill Cooling Pond Emergency Overflow but has since been rerouted to the South WWTP. However, the cooling pond has not been used for several years. IMP 501 will be removed from this renewal permit.

IMP 101 collects and treats sanitary sewage. The treatment system at IMP 101 (Sanitary WWTP) consist of solids setting (2 Imhoff Tanks in parallel), trickling filter, and disinfection with sodium hypochlorite.

IMP 201 collects and treats wastewater from various production lines subject to Federal Effluent Limitation Guidelines (ELGs), miscellaneous contact water, non-contact cooling water, boiler blowdown, boiler condensate, boiler feedwater

Approve	Deny	Signatures	Date
X		Adam Olesnanik, P.E. / Environmental Engineer	September 26, 2024,
X		Michael E. Fifth, P.E. / Environmental Engineer Manager	September 26, 2024

Summary of Review

treatment wastewater, waste oil wastewater, groundwater, stormwater, acid seep collection system wastewater, and the discharge from the South Taylor Environmental Park (STEP). The discharges from STEP are untreated residual waste landfill leachate, treated hazardous landfill leachate, and acid mine drainage. STEP is a captive landfill USS used for the disposal of various steel manufacturing wastes streams (i.e. combustion residuals, metallurgical process residuals, sludges and scales, etc.). The various production lines that are routed to the treatment system that discharge via IMP 201 are:

- The 64-inch Continuous Pickle Production line (Hydrochloric Acid Pickling Rinse water and one fume scrubber), which is subject to 40 CFR 420.94(b)(2) and 420.94(b)(4).
- The 84-inch Continuous Pickle Production line (Hydrochloric Acid Pickling Rinse water and one fume scrubber), which is subject to 40 CFR 420.92(b)(2) and 420.92(b)(4).
- The Continuous Annealing Line (Alkaline Cleaning of Strip), which is subject to 40 CFR 420.112(b) and 420.113(b).
- The Cold Reduction Mill (Cold Rolling of Steel in a five-stand recirculating mill), which is subject to 40 CFR 420.102(a)(2) and 420.103(a)(2).
- The No. 1 Galvanize Line (Hot Coating of Steel Strip), which is subject to 40 CFR 420.122(a)(1) and 420.123(a)(1).
- The No. 2 Galvanize Line (Alkaline Cleaning of Steel Strip, Hot Coating of Steel Strip and one fume scrubber), which is subject to 40 CFR 420.112(b), 420.113(b), 420.122(a)(1), 420.122(c), 420.123(a)(1), and 420.123(c).
- The Temper Mill (Cold Rolling of Steel in Single-stand Direct Application Mill), which is subject to 40 CFR 420.102(a)(4) and 420.103(a)(4).

The treatment system at IMP 201 (South WWTP) consists of a waste oil treatment system (phase separation, oil skimmers, and re-use of reclaimed oil), equalization, neutralization, chemical precipitation, flocculation, and clarification (3 clarifiers in parallel).

As described above, IMP 201 is the monitoring point for the South WWTP, which collects and treats various wastewater streams including wastewater subject to ELGs, contact and non-contact cooling water, waste oil wastewater, untreated residual landfill leachate, treated hazardous landfill leachate, and various other non-process wastewater. The limitations that apply to wastewaters that are subject to ELGs should apply to those wastewaters before comingling with other wastewaters. In other words, dilution shouldn't be used to treat or meet the limitations from the ELGs. However, all of the wastewater at the South WWTP are combined and treated together. The Department can use the flow rates of each waste stream, prior to commingling, to adjust the loading limits and concentration limits to consider dilution. Additionally, some of the other waste streams may contain parameters that have limitations from the ELG that add to the discharge load but were not considered in the total loading limit. Therefore, the Department can increase the loading for a parameter present in a non-process waste stream by using the flow rate of the waste stream and the concentration in the waste stream or an applicable concentration limit for that wastewater. However, at this point in time, the Department does not have the flow data of each individual waste stream that is collected and treated at the South WWTP; therefore, the Department is requesting that this information be collected during this permit term and submitted with the next renewal application. The Department has included in Part C of the Draft Permit a requirement to conduct a Wastewater Source Flow Study. As part of the flow study, the permittee shall monitor the influent flow of the various waste streams separately before comingling together for treatment. The study should contain at least two years' worth of flow data; noting the estimated average flow rate of each waste stream that is treated in the South WWTP on a monthly basis to determine a long-term average flow rate of each waste stream. The flow study shall be submitted to the Department, with the renewal application, at least 180 days prior to the expiration date of this permit.

IMP 301 collects and treats the Carbon Plate Mill hot forming operations wastewater, miscellaneous contact water, filter backwash. The 80" Hot Strip Mill (Carbon Plate Mill Hot Forming Operations) is subject to 40 CFR 420.72(c)(1). The treatment system at IMP 301 (North WWTP) consists of sedimentation (2 scale pits with oil skimmers), flocculation, clarification (2 clarifiers in parallel) and sand filtration. Solids handling consist of clarifier, thickening and solids dewatering via centrifuge or vacuum filter. Skimmed oil is collected and directed to the waste oil treatment system at IMP 201.

IMP 601 is the discharge from the Hot Strip Mill North Scale Pit Emergency Overflow and miscellaneous contact water.

IMP 701 is the discharge from the Hot Strip Mill South Scale Pit Emergency Overflow and miscellaneous contact water.

Summary of Review

Outfall 002 discharges the Travel Screen Backwash.

Outfall 003 discharges NCCW, Boiler Blowdown, and Stormwater.

Outfall 004 discharges Stormwater.

Outfall 005 discharges Stormwater.

Clean Water Act § 316(b) – Cooling Water Intake Structures

On August 15, 2014, EPA promulgated Clean Water Act Section 316(b) regulations applicable to cooling water intake structures. The regulations established best technology available ("BTA") standards to reduce impingement mortality and entrainment of all life stages of fish and shellfish at existing power generating and manufacturing facilities. The Final Rule took effect on October 14, 2014. Regulations implementing the 2014 Final Rule (and the previously promulgated Phase I Rule) are provided in 40 CFR Part 125, Subparts I and J for new facilities and existing facilities, respectively. Associated NPDES permit application requirements for facilities with cooling water intake structures are provided in 40 CFR Part 122, Subpart B – Permit Application and Special NPDES Program Requirements (§ 122.21(r)).

The Irvin Plant is an "existing facility" as defined in 40 CFR § 125.92(k). As an existing facility, Irvin is subject to 40 CFR Part 125, Subpart J – Requirements Applicable to Cooling Water Intake Structures for Existing Facilities Under Section 316(b) of the Clean Water Act (§§ 125.90 – 125.99) if the facility meets the rule's applicability criteria. Pursuant to the applicability criteria given by § 125.91(a), Irvin is subject to the requirements of §§ 125.94 – 125.99 if:

(1) The facility is a point source;

(2) The facility uses or proposes to use one or more cooling water intake structures with a cumulative design intake flow (DIF) of greater than 2 million gallons per day (mgd) to withdraw water from waters of the United States; and

(3) Twenty-five percent or more of the water the facility withdraws on an actual intake flow basis is used exclusively for cooling purposes.

Irvin is a point source as defined in 40 CFR § 122.2. Irvin uses one cooling water intake structure with a cumulative Design Intake Flow greater than 2 MGD (86.40 MGD). And Irvin uses more than 25% of the water it withdraws for cooling purposes, thus exceeding the 25% applicability threshold. Thus, Irvin is subject to the requirements of §§ 125.94 – 125.99.

Water is withdrawn from the Monongahela River for the Irvin Pant through a shoreline intake structure located on the western bank of the Monongahela River between river mile 17 and 18, known as the Irvin River Pump House (RPH). The RPH provides process and cooling water for once-through cooling for the facility. Water is withdrawn and discharged into the Monongahela River 365 days per year. The invert elevation of the RPH is 713 ft. The normal water elevation is 718.8 feet, which is also reported as the low water elevation. The RPH consists of a concrete structure approximately 127 ft in length and 30 ft wide that houses the intake pumps. A 28-ft section of the structure is flushed with the river and contains the trash bars and traveling screens. Water is withdrawn through a series of three separate openings that are protected by trash bars and a floating skimmer. The trash bars are constructed of 0.5 in. thick steel bars with 2.5-inch openings between the bars. Each of the three trash bars is approximately 8 feet wide. Water withdrawn through the trash bars is directed through intake openings that are each 4 feet wide by 5 feet high that lead to a screen chamber equipped with a traveling water screen, three in total. The traveling screens are through-flow with 0.375-inch wire mesh openings. Each screen panel is approximately 6 feet wide by 2 feet high, with an overall channel depth of 46 feet from the CWIS intake elevation of 713 feet to the deck/operating floor elevation of 759 feet. Each screen chamber then discharges through another 4-foot wide by 5-foot high opening into a common suction tunnel that feed the pumps. There are 5 pump systems or stations that pump water to the facility for use. Each pump station consists of two pumps in series, one low stage and one high stage. Each pump is rated for 12,000 gpm. Two pump stations are in operation continuously under normal conditions. Occasionally a third pump station may be used depending on flow demand. Flow from the pumps are regulated via cone valves and bypass valves. Excess water from the two pumps is bypassed back to the suction tunnel.

No physical studies were performed to determine the intake area of influence (AOI) within the waterbody. A desktop analysis was performed to calculate the approximate AOI within the 0.5 feet per second velocity contour. EPA considers a velocity of 0.5 fps to be a de minimis value relative to impingement concerns because fish have the swimming ability to overcome this

Summary of Review

velocity and avoid impingement. Based on the physical dimensions of the CWIS, the DIF, 5-year minimum AIF, and assuming the water is at low level, velocities have been computed at the face of the CWIS. At DIF flow of 86.40 MGD, the water velocity at the face of the intake is approximately 0.89 fps and the AOI extends approximately 4.5 feet into the water body past the face of the intake. At the 5-year maximum daily AIF of 51.84, the velocity at the face if the CWIS is approximately 0.53 fps and the AOI extends less than 0.5 feet into the waterbody. During typical operations with two pumps operating at a daily AIF of 34.6 MGD, the velocity at the face of the CWIS is approximately 0.36 fps and the AOI does not extend past the face of the intake. The design through-screen velocity was calculated to be 2.14 fps, the max daily actual intake velocity was calculated to be 1.28 fps, and the typical actual intake velocity was calculated to be 0.85 fps.

No impingement or entrainment data have been collected at the Irvin Plant intake. However, fisheries information is available from Braddock Pool of the Monongahela River and impingement and entrainment data are available from other facilities withdrawing from the Monongahela River nearby. These sources were used to identify taxa in the vicinity of the CWIS and those most susceptible to impingement and entrainment. USS Irvin and USS Clairton both withdraw from the Braddock Pool and have a shoreline CWIS, trash racks/bars, and traveling water screens. Elrama Generating Station and Mitchell Power Station historically withdrew from the Elizabeth Pool, directly upstream of the Braddock Pool. The results of the impingement and entrainment studies at these facilities reflect the species abundant in the Monongahela River that are susceptible to impingement or entrainment. However, design and actual intake flows differ among the facilities and the raw numbers are not necessarily representative of the magnitude of impingement or entrainment at Irvin.

USS requests that the Department, in accordance with 40 CFR 125.95(a)(2) establish an alternate schedule for the submission of the information required in 40 CFR 122.21(r) when USS applies for a subsequent permit. USS believes that the Irvin permit falls under this provision of the Federal Regulations and it is not possible for USS to develop the required information prior to the current renewal.

The following modified cooling water intake structure requirements will be included in Part C of the Draft permit:

COOLING WATER INTAKE STRUCTURE – Clean Water Act § 316(b)

A. Based upon information provided by the permittee, the Department has made a determination that the permittee operates interim Best Technology Available (BTA) to comply with the impingement and entrainment mortality standard based upon available information at the time of permit issuance. This interim BTA determination may be revised upon submission of additional information by the permittee with the NPDES permit renewal application. Revisions to the BTA determination shall be effective only through amendment or renewal of the NPDES permit.

   To comply with the interim BTA determination, U.S. Steel shall under normal operating conditions Operate the Irvin River Pump House (RPH) with a maximum actual through screen velocity of 1.5 fps. To document compliance with the interim BTA determination for this permit term, cooling water intake flow and through screen velocity (if applicable) will be calculated in the Cooling Water Intake Monitoring Supplemental Report (3800-FM-BCW0010) by U.S. Steel once per month and submitted to the Department along with the monthly eDMR. If U.S. Steel reports an interim BTA through screen velocity greater than 1.5 fps for RPH, and contends that such through screen velocity occurred under non-normal operating conditions, then U.S. Steel shall provide the Department, along with the monthly eDMR, with an explanation as to why the through screen velocity was greater than the identified interim BTA stated above, what the non-normal operating condition was, why that condition is non-normal, how frequently that condition is expected to reoccur, and why that condition caused such a velocity.

B. Nothing in this permit authorizes a take of endangered or threatened species under the Endangered Species Act.

C. Technology and operational measures currently employed at the cooling water intake structures must be operated in a way that minimizes impingement mortality and entrainment to the fullest extent practicable.

D. The location, design, construction or capacity of the intake structure(s) may not be altered without prior approval of DEP.

E. In accordance with 40 CFR § 125.95(a)(2), an alternate schedule is provided for the permittee to submit the information required by 40 CFR § 122.21(r).The permittee shall submit the information specified below with its permit renewal application due 180 days prior to the permit expiration date of the permit.

Summary of Review

1. Source water physical data.
2. Cooling water intake structure data.
3. Source water biological baseline characterization data.
4. Cooling water system data.
5. Chosen method(s) of compliance with impingement mortality standard from 40 CFR § 125.94(c).
6. Entrainment performance studies.
7. Operational status.

F. If the facility covered by this permit withdraws greater than 125 MGD on an Actual Intake Flow basis as defined in 40 CFR § 125.92, the permittee must submit the applicable information in 40 CFR §122.21(r)(9) – (r)(13) with the subsequent permit renewal application, as follows:

1. Entrainment Characterization Study.
2. Comprehensive Technical Feasibility and Cost Evaluation Study (including, but not limited to, evaluations of closed-cycle recirculating cooling, fine mesh screens with a mesh size of 2 mm or less, alternate sources of cooling water, water reuse, variable speed pumps, variable frequency drives, and seasonal flow reductions).
3. Benefits Valuation Study.
4. Non-Water Quality Environmental and Other Impacts Study.
5. Peer Review, completed by peer reviewer(s) approved by DEP.

G. If the facility covered by this permit withdraws less than or equal to 125 MGD on an Actual Intake Flow basis as defined in 40 CFR § 125.92, the permittee must submit an entrainment reduction technology evaluation with the subsequent permit renewal application, which must include at a minimum, an evaluation of the feasibility, cost estimates, and environmental impacts of reducing intake flow using alternate sources of cooling water, water re-use, closed-cycle recirculating cooling; and fine mesh screens.

H. If DEP requests additional information to make a BTA determination, the permittee shall submit information within 30 days unless a different time frame is approved by DEP.

I. If DEP determines the methods to meet impingement and entrainment BTA requirements are not sufficient, the permittee shall employ additional controls to reduce adverse impacts from impingement and entrainment.

J. The permittee shall, on an annual basis, submit a report describing any modifications to the operation of any unit at the facility that impacts cooling water withdrawals or operation of the cooling water intake structure(s) during a calendar year. If not applicable, the permittee shall submit a statement certifying that no modifications have occurred in lieu of a report. The annual report or statement is due by January 28 of each year.

K. The permittee shall retain data and other records for any information developed pursuant to Section 316(b) of the Clean Water Act for a minimum of ten years.

L. New Units - The permittee must submit applicable information in 40 CFR §122.21(r) at least 180 days prior to the planned commencement of cooling water withdrawals associated with the operation of a new unit (as defined in 40 CFR §125.92(u)).

Summary of Review

The permittee has three open violations. All three violations are with the Southwest Regional Office Tanks Program.

The site was last inspected on February 20, 2024; one violation was noted, but has sinse been resolved.

Draft Permit Issuance is recommended.

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 (IMP 101, 201, 301, 601, and 701)	Design Flow (MGD)	23.6
Latitude	40º 20' 14.3"	Longitude	-79º 53' 41.3"
Quad Name	Glassport	Quad Code	1606
Wastewater Description:	IW Process Effluent with ELG, Treated Sewage, Treated Hazardous Waste Leachate, Residual Waste Leachate, Acid Seep Collection, AMD, Waste Oil Wastewater, NCCW, Cooling Towner Blowdown, Boiler Blowdown, Emergency Overflow, and Stormwater		

Receiving Waters	Monongahela River (WWF)	Stream Code	37185
NHD Com ID	99408282	RMI	17.53
Drainage Area	5410	Yield (cfs/mi^2)	0.102
Q_{7-10} Flow (cfs)	550	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	712	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	Polychlorinated Biphenyls (PCBS)		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Monongahela River TMDL

Nearest Downstream Public Water Supply Intake	PA American Water Company - Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1,230
PWS RMI	4.6	Distance from Outfall (mi)	12.77

Discharge, Receiving Waters and Water Supply Information

Outfall No.	002	Design Flow (MGD)	Varies
Latitude	40º 20' 2.5"	Longitude	-79º 53' 48.2"
Quad Name	Glassport	Quad Code	1606
Wastewater Description:	Travel Screen Backwash		

Receiving Waters	Monongahela River (WWF)	Stream Code	37185
NHD Com ID	99408282	RMI	17.75
Drainage Area	5410	Yield (cfs/mi^2)	0.102
Q_{7-10} Flow (cfs)	550	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	712	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	Polychlorinated Biphenyls (PCBS)		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Monongahela River TMDL

Nearest Downstream Public Water Supply Intake	PA American Water Company - Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1,230
PWS RMI	4.6	Distance from Outfall (mi)	12.77

Discharge, Receiving Waters and Water Supply Information

Outfall No.	003	Design Flow (MGD)	1.72
Latitude	40º 19' 44.2"	Longitude	-79º 53' 59.9"
Quad Name	Glassport	Quad Code	1606
Wastewater Description:	NCCW, Boiler Blowdown, and Stormwater		

Receiving Waters	Monongahela River (WWF)	Stream Code	37185
NHD Com ID	99408282	RMI	18.1
Drainage Area	5410	Yield (cfs/mi^2)	0.102
Q_{7-10} Flow (cfs)	550	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	712	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	Polychlorinated Biphenyls (PCBS)		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Monongahela River TMDL

Nearest Downstream Public Water Supply Intake	PA American Water Company - Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1,230
PWS RMI	4.6	Distance from Outfall (mi)	12.77

Discharge, Receiving Waters and Water Supply Information

Outfall No.	004	Design Flow (MGD)	Varies
Latitude	40º 19' 51.5"	Longitude	-79º 53' 52.4"
Quad Name	Glassport	Quad Code	1606
Wastewater Description:	Stormwater		

Receiving Waters	Monongahela River (WWF)	Stream Code	37185
NHD Com ID	99408282	RMI	17.9
Drainage Area	5410	Yield (cfs/mi²)	0.102
Q_{7-10} Flow (cfs)	550	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	712	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	Polychlorinated Biphenyls (PCBs)		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Monongahela River TMDL

Nearest Downstream Public Water Supply Intake	PA American Water Company - Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1,230
PWS RMI	4.6	Distance from Outfall (mi)	12.77

Discharge, Receiving Waters and Water Supply Information

Outfall No.	005	Design Flow (MGD)	Varies
Latitude	40º 20' 27.3"	Longitude	-79º 54' 5.9"
Quad Name	Glassport	Quad Code	1606
Wastewater Description:	Stormwater		

Receiving Waters	Monongahela River (WWF)	Stream Code	37185
NHD Com ID	99408282	RMI	17.37
Drainage Area	5410	Yield (cfs/mi^2)	0.102
Q_{7-10} Flow (cfs)	550	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	712	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	Polychlorinated Biphenyls (PCBS)		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Monongahela River TMDL

Nearest Downstream Public Water Supply Intake	PA American Water Company - Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1,230
PWS RMI	4.6	Distance from Outfall (mi)	12.77

Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	23.6
Latitude	40º 20' 14.3"	**Longitude**	-79º 53' 41.3"
Wastewater Description:	IW Process Effluent with ELG, Treated Sewage, Treated Hazardous Waste Leachate, Residual Waste Leachate, Acid Seep Collection, AMD, Waste Oil Wastewater, NCCW, Cooling Towner Blowdown, Boiler Blowdown, Emergency Overflow, and Stormwater		

Technology-Based Limitations

Sewage Minimum Technology and BPJ Standards:

The sewage limitations will be evaluated and imposed at the Internal Monitoring Point, IMP 101.

Federal Effluent Limitation Guidelines (ELGs)

The ELG limitations will be evaluated and imposed at the Internal Monitoring Points (IMP 201 and 301).

Regulatory Effluent Standards and Monitoring Requirements

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1).

As oil-bearing wastewaters, discharges from Outfall 001 are subject to effluent standards for oil and grease from 25 Pa. Code § 95.2(2).

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.

Effluent standards for pH are also imposed on industrial wastes by 25 Pa. Code § 95.2(1).

Temperature limits will be imposed per the Department's "*Implementation Guidance for Temperature Criteria*." As a policy, DEP normally imposes a maximum temperature limit of 110°F on discharges that contain residual heat. The limit is intended as a safety measure to protect sampling personnel or anyone who may come into contact with the heated discharge where it enters the receiving water.

Table 1: Regulatory Effluent Standards and Monitoring Requirements for Outfall 001

Parameter	Monthly Average	Daily Maximum	IMAX	Units
Flow	Monitor and Report		XXX	MGD
Oil & Grease	15	30	XXX	mg/L
Total Residual Chlorine	0.5	1.0	XXX	mg/L
Temperature	XXX	XXX	110	°F
pH	Not less than 6.0 nor greater than 9.0			S.U.

Per- and Polyfluoroalkyl Substances (PFAS)

In February 2024, DEP implemented a new monitoring initiative for PFAS consistent with an EPA memorandum that provides guidance to states for addressing PFAS discharges. PFAS are a family of thousands of synthetic organic chemicals that contain a chain of strong carbon-fluorine bonds. Many PFAS are highly stable, water- and oil-resistant, and exhibit other properties that make them useful in a variety of consumer products and industrial processes. PFAS are resistant to biodegradation, photooxidation, direct photolysis, and hydrolysis and do not readily degrade naturally; thus, many PFAS accumulate over time. According to the United States Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR), the environmental persistence and mobility of some PFAS, combined with decades of widespread use, have resulted in their presence in surface water, groundwater, drinking water, rainwater, soil, sediment, ice caps, outdoor and indoor air, plants, animal tissue, and human blood serum across the globe. ATSDR also reported that exposure to certain PFAS can lead to adverse human health impacts Due to their durability, toxicity, persistence, and pervasiveness, PFAS have emerged as potentially significant pollutants of concern.

In accordance with Section II.I of DEP's "Standard Operating Procedure (SOP) for Clean Water Program – Establishing Effluent Limitations for Individual Industrial Permits" [SOP No. BCW-PMT-032] and under the authority of 25 Pa. Code §

92a.61(b), DEP has determined that monitoring for a subset of common/well-studied PFAS including Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), Perfluorobutanesulfonic acid (PFBS), and Hexafluoropropylene oxide dimer acid (HFPO-DA) is necessary to help understand the extent of environmental contamination by PFAS in the Commonwealth and the extent to which point source dischargers are contributors. SOP BCW-PMT-032 directs permit writers to consider special monitoring requirements for PFOA, PFOS, PFBS, and HFPO-DA in the following instances:

a. If sampling that is completed as part of the permit renewal application reveals a detection of PFOA, PFOS, HFPO-DA or PFBS (any of these compounds), the application manager will establish a quarterly monitoring requirement for PFOA, PFOS, HFPO-DA and PFBS (all of these compounds) in the permit.

b. If sampling that is completed as part of the permit renewal application demonstrates non-detect values at or below the Target QLs for PFOA, PFOS, HFPO-DA and PFBS (all of these compounds in a minimum of 3 samples), the application manager will establish an annual monitoring requirement for PFOA, PFOS, HFPO-DA and PFBS in the permit.

c. In all cases the application manager will include a condition in the permit that the permittee may cease monitoring for PFOA, PFOS, HFPO-DA and PFBS when the permittee reports non-detect values at or below the Target QL for four consecutive monitoring periods for each PFAS parameter that is analyzed. Use the following language: The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS if the results in 4 consecutive monitoring periods indicate non-detects at or below Quantitation Limits of 4.0 ng/L for PFOA, 3.7 ng/L for PFOS, 3.5 ng/L for PFBS and 6.4 ng/L for HFPO-DA. When monitoring is discontinued, permittees should enter a No Discharge Indicator (NODI) Code of “GG” on DMRs.

Irvin’s application was submitted before the NPDES permit application forms were updated to require sampling for PFOA, PFOS, PFBS, and HFPO-DA. Also, according to EPA’s guidance, Irvin does not operate in one of the industries EPA expects to be a source for PFAS. Therefore, annual reporting of PFOA, PFOS, PFBS, and HFPO-DA will be required consistent with Section II.I.b of SOP BCW-PMT-032. Even though Irvin did not report results for PFOA, PFOS, PFBS, and HFPO-DA on the permit application, as a facility operating in a suspected non-source industry, it is reasonable to conclude that if Irvin did report results for PFOA, PFOS, PFBS, and HFPO-DA on the application, the results may have been non-detect values, which would subject Irvin to the annual monitoring requirements described in Section II.I.b of the SOP.

As stated in Section II.I.c of the SOP, if non-detect values at or below DEP’s Target QLs are reported for four consecutive monitoring periods (i.e., four consecutive annual results in Irvin’s case), then the monitoring may be discontinued.

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 2. 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 3.

Table 2: TMS Inputs for Outfall 001

Parameter	**Value**
River Mile Index	17.53
Discharge Flow (MGD)	23.6
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	5,410
$Q_{7\text{-}10}$ (cfs)	550
Low-flow yield (cfs/mi^2)	0.102
Elevation (ft)	712
Slope	0.0001

Table 3: Water Quality Based Effluent Limitations at Outfall 001

Parameters	Average Monthly	Daily Maximum	Discharge Concentration
Total Aluminum (mg/L)	1.25	1.95	1.75
Hexavalent Chromium (µg/L)	Report	Report	3.9
Total Copper (µg/L)	Report	Report	5.27
Total Iron (mg/L)	Report	Report	4.29
Total Zinc (µg/L)	Report	Report	43.6

<u>Total Residual Chlorine</u>

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 no WQBELs are required for TRC.

WQM 7.0 Water Quality Modeling Program

WQM 7.0 is a water quality modeling program for Windows that determines waste load allocations and effluent limitations for carbonaceous biochemical oxygen demand (CBOD5), ammonia nitrogen (NH3-N), and dissolved oxygen (DO) for single and multiple point-source discharge scenarios. To accomplish this, the model simulates two basic processes. In the NH3-N module, the model simulates the mixing and degradation of NH3-N in the stream and compares calculated instream NH3-N concentrations to NH3-N water quality criteria. In the DO module the model simulates the mixing and consumption of DO in the stream due to the degradation of CBOD5 and NH3-N and compares calculated instream DO concentrations to DO water quality criteria. WQM 7.0 then determines the highest pollutant loadings that the stream can assimilate while still meeting water quality criteria under design conditions. WQM 7.0 was run for Outfall 001 because the outfall discharge treated sewage wastewater. The WQM-7 model was run using the discharge and receiving stream characteristics shown in Table X above. The modeling results, which are include in Attachment D, indicate that WQBELs are required for CBOD5 and NH3-N during the summer; but no WQBELs are required for CBOD5 or NH3-H in the winter. The proposed summer limitations for CBOD5 are, 16.6 mg/L average monthly and 33.2 mg/L daily maximum. The proposed summer limitations for NH3-N are, 5.3 mg/L average monthly and 10.6 mg/L daily maximum. No WQBELs are required for dissolved oxygen. The summer limitations for CBOD5 and NH3-N will be imposed from May through September and a monitor and report requirement will be imposed from October through April.

Thermal WQBELs for Heated Discharges

Thermal WQBELs are evaluated using DEP's "Thermal Discharge Limit Calculation Spreadsheet" created with Microsoft Excel for Windows. The program calculates temperature WLAs through the application of a heat transfer equation, which takes two forms in the program depending on the source of the facility's cooling water. In Case 1, intake water to a facility is from the receiving stream. In Case 2, intake water is from a source other than the receiving stream (e.g., municipal water supply). The determination of which case applies to a given discharge is determined by the input data which include the receiving stream flow rate (Q_{7-10} or the minimum regulated flow for large rivers), the stream intake flow rate, external source intake flow rates, consumptive flow rates and site-specific ambient stream temperatures. Case 1 limits are generally expressed as heat rejection rates while Case 2 limits are usually expressed as temperatures.

Since the temperature criteria from 25 Pa. Code Chapter 93.7(a) are expressed on monthly and semi-monthly bases for three different aquatic life-uses—cold water fishes, warm water fishes and trout stocking—the program generates monthly and semi-monthly limits for each use. DEP selects the output that corresponds to the aquatic life-use of the receiving stream and consequently which limits apply to the discharge. Temperature WLAs are bounded by an upper limit of 110°F for the safety of sampling personnel and anyone who may come into contact with the heated discharge where it enters the receiving water. If no WLAs below 110°F are calculated, an instantaneous maximum limit of 110°F is recommended by the program.

Due to the nature of the discharges and their relative locations on the receiving stream, all heated discharges will be evaluated as one discharge to ensure the temperature criteria is met instream from all of the heated discharges and a combined flow of 25.32 MGD was used in the model. Discharges from Outfall 001 and Outfall 003 are classified under Case 1 because water is obtained via an intake structure owned by the permittee on the Monongahela River. The results of the thermal analysis, included in Attachment E, indicate that no WQBELs for temperature are required at Outfall 001. Therefore, the 110°F daily maximum temperature limit will be imposed at Outfall 001

Anti-backsliding:

Previous effluent limits and monitoring requirements can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l) and are displayed below in Table 4.

Table 4: Existing Effluent Limitation for Outfall 001

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/Week	Measure

Table 4: Existing Effluent Limitation for Outfall 001

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Temperature (°F) *	XXX	XXX	XXX	XXX	110	XXX	1/Week	I-S
Oil and Grease	XXX	XXX	XXX	15.0	XXX	30.0	1/Week	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/Week	Grab

* There shall be no net addition of pollutants to non-contact cooling water over intake values except for heart and water conditioning additivities for which complete information was submitted in the appellation of is required to be submitted as a condition of this permit.

*For the purpose of determining compliance with any maximum daily temperature limitations in apart A of this permit and notwithstanding A.2.o of this permit, the temperature value shall consist of the average of three (30 individual immersion stabilization temperature measurements over a twenty-four hour period. The individual temperate measurement shall be taken at equal internals over the period as is practical and in no case shall any two individual temperature measurements be taken at less than a one (1) hour interval.

Proposed Effluent Limitations

The proposed effluent limitations for Outfall 001 are displayed in Table 5 below, they are the most stringent values from the above effluent limitation development.

Table 5: Proposed Effluent Limitation for Outfall 001

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/Week	Measure
Temperature (°F)	XXX	XXX	XXX	XXX	XXX	110	1/Week	I-S
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	1.0	XXX	1/Week	Grab
Oil and Grease	XXX	XXX	XXX	15.0	30.0	XXX	1/Week	Grab
CBOD5							1/Week	Grab
May 1 – Sept 30	XXX	XXX	XXX	16.6	32.2	XXX		
Oct 1 – April 30	XXX	XXX	XXX	Report	Report	XXX		
NH3-N							1/Week	Grab
May 1 – Sept 30	XXX	XXX	XXX	5.3	10.6	XXX		
Oct 1 – April 30	XXX	XXX	XXX	Report	Report	XXX		
Total Aluminum	XXX	XXX	XXX	1.25	1.95	XXX	1/Week	Grab
Hexavalent Chromium	XXX	XXX	XXX	Report	Report	XXX	1/Week	Grab
Total Copper	XXX	XXX	XXX	Report	Report	XXX	1/Week	Grab
Total Iron	XXX	XXX	XXX	Report	Report	XXX	1/Week	Grab
Total Zinc	XXX	XXX	XXX	Report	Report	XXX	1/Week	Grab
PFOA (ng/L)	XXX	XXX	XXX	XXX	Monitor	XXX	1/year	Grab
PFOS (ng/L)	XXX	XXX	XXX	XXX	Monitor	XXX	1/year	Grab
PFBS (ng/L)	XXX	XXX	XXX	XXX	Monitor	XXX	1/year	Grab
HFPO-DA (ng/L)	XXX	XXX	XXX	XXX	Monitor	XXX	1/year	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/Week	Grab

Final WQBEL Compliance Report and Interim Monitoring

The WQBELs listed in Table 5 above for Total Aluminum are new to Outfall 001. US Steel may not have the necessary controls in place to ensure compliance with the WQBELs upon permit issuance. Therefore, in accordance with 25 Pa. Code § 92a.51(a) of DEP's regulations, US Steel will be granted three years to come into compliance with the WQBELs. Because the new WQBELs will not be effective upon permit issuance, the permit will be tiered to have interim and final effluent limitations. For the first three years, Total Aluminum will have monitor and report requirements, and after three years, the WQBELs will take effect. Additionally, because the WQBELs were developed using the default or model-derived estimates, the permittee shall collect site-specific data and conduct a Toxics Reduction Evaluation (TRE). The site-specific data and TRE will be submitted to the Department as part of a Final WQBEL Compliance Report.

Development of Effluent Limitations

IMP No. 101 **Design Flow (MGD)** 0.048
Latitude 40º 20' 15" **Longitude** -79º 53' 46"
Wastewater Description: Treated Sewage

Technology-Based Limitations - Sewage Minimum Technology and BPJ Standards:

The following are minimum technology based and BPJ standards for sewage discharges.

Table 6. Standard Sewage Tech Limits

Parameter	Minimum	Average Monthly	Average Weekly	IMAX	Basis
Flow (MGD)	XXX	Report	Report Max Daily	XXX	92a.27, 92a.61
CBOD5 (mg/L)	XXX	25	40*	50	92a.47
TSS (mg/L)	XXX	30	45*	60	92a.47
TRC (mg/L)	XXX	0.5	XXX	1.6	92a.47 & 48
NH3-N (mg/L)	XXX	25	XXX	50	BPJ
D.O. (mg/L)	4.0	XXX	XXX	XXX	BPJ
pH (SU)	6.0	XXX	XXX	9.0	92a.47, 95.2
Total N (mg/L)	XXX	Report	XXX	XXX	92a.61
Total P (mg/L)	XXX	Report	XXX	XXX	92a.61
Fecal Coliform May-Sept (no./100 ml)	XXX	200 Geo Mean	XXX	1,000	92a.47
Fecal Coliform Oct-April (no./100 ml)	XXX	2,000 Geo Mean	XXX	10,000	92a.47

*Weekly average limits for CBOD5 and TSS will not be imposed where the sampling frequency is less than 1/week.

Water Quality-Based Limitations

A water quality analysis was not conducted at the internal monitoring point because water quality was evaluated at the discharge point, Outfall 001.

Anti-backsliding:

Previous effluent limits and monitoring requirements can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l) and are displayed below in Table 7.

Table 7: Existing Effluent Limitation for IMP 101

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/Week	Measure
CBOD 5-Day	XXX	XXX	XXX	25.0	50.0	62.5***	1/Week	8-hour Composite
Total Suspended Solids	XXX	XXX	XXX	30.0	60.0	75.0***	1/Week	8-hour Composite
Fecal Coliform	XXX	XXX	XXX	Refer to Condition No.2 in Part C			1/Week	Grab
Total Residual Chlorine **	XXX	XXX	XXX	1.4	XXX	3.3	1/Week	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/Week	Grab

*****Refer to Condition No.7 in Part C
******Refer to Condition No.8 in Part C
*******Refer to Condition No.9 in Part C

Condition C.7.

Collected screenings, slurries, sludges, and other solids shall be handled and disposed of in compliance with 25 Pa. Code, Chapters 271, 273, 275, 283, and 285 (related to permits and requirements for landfilling, land application , incineration and storage of sewage sludge) Federal Regulations 40 CFR 257, and the Federal Clean Water Act and its amendments.

Sludges and other solids shall be handled and disposed of in compliance with the Solids Waste Management Act f 1980 (Act 97) and with 25 Pa. Code Chapter 261, 262, 263 and 264 (related to permits and requirements for landfilling an storage of sewage sludge) Federal Regulations, the Federal Clean Water Act, RCRA and their amendments.

Sludges and other solids shall be handled and disposed of in compliance with the Solid Waste Management Act of 1980 (Act 97) and with 25 Pa. Code Chapters 287, 291, and 299 (related to residual waste generators) and 288 and 289 (related to residual waste landfills and impoundments) and the Federal Clean Water Act and its amendments.

Condition C.8.

The permittee will ensure that applied chlorine dosages, used for disinfection or other purposes, are optimized to the degree necessary such that the total residual chlorine in the discharge foes not cause an adverse stream impact. In doing so, the permittee shall consider relevant factors affecting chlorine dosage, such as wastewater characteristics, mixing and contact times, desired result of chlorination, and expected impact on the receiving water body.

To reduce or eliminated the amount of chlorine discharged into water bodies, the permittee must: (1) improve/adjust process controls and (2) improve operation/maintenance practices.

If the Department determines or receives documented evidence levels of TRC in the permittee’s effluent are causing adverse impacts in the receiving water, the permittee shall institute necessary additional steps to reduce or eliminate such impact.

Condition C.9.

Instantaneous maximum limitations are imposed to allow for a grab to be collected by the appropriate regulatory agency to determined compliance. The permittee is not required to monitor for the instantaneous maximum limitations. However, if grab samples are collected by the permittee, the results must be reported except for the results of individual grab collected by the permittee to comply with a sample type specified as 3/grabs/24 hours. These limits serve as a screening tool to assist field staff in enforcement decision-making. These limits are to be used as indicators to help determine the need for follow-up compliance inspections.

Proposed Effluent Limitations

The proposed effluent limitations for IMP 101 are displayed in Table 8 below, they are the most stringent values from the above effluent limitation development.

Table 8: Existing Effluent Limitation for IMP 101

Parameters	Concentration (mg/L)					Monitoring Requirements	
	Minimum	Average Monthly	Average Weekly	Daily Maximum	IMAX	Frequency	Sample Type
Flow (MGD)	XXX	Report	XXX	Report	XXX	1/Week	Measure
CBOD5 (mg/L)	XXX	25	40	50	62.5*	1/Week	8-hour Composite
TSS (mg/L)	XXX	30	45	60	75.0*	1/Week	8-hour Composite
TRC (mg/L)	XXX	0.5	XXX	XXX	1.6	1/Week	Grab
NH3-N (mg/L)	XXX	25	XXX	XXX	50	1/Week	Grab
D.O. (mg/L)	4.0	XXX	XXX	XXX	XXX	1/Week	Grab
pH (SU)	6.0	XXX	XXX	XXX	9.0	1/Week	Grab
Total N (mg/L)	XXX	Report	XXX	XXX	XXX	1/Week	Grab
Total P (mg/L)	XXX	Report	XXX	XXX	XXX	1/Week	Grab
Fecal Coliform May-Sept (no./100 ml)	XXX	200 Geo Mean	XXX	XXX	1,000	1/Week	Grab
Fecal Coliform Oct-April (no./100 ml)	XXX	2,000 Geo Mean	XXX	XXX	10,000	1/Week	Grab

*Instantaneous maximum limitations are imposed to allow for a grab sample to be collected by the appropriate regulatory agency to determine compliance. The permittee is not required to monitor for the instantaneous maximum limitations. However, if grab samples are collected by the permittee, the results must be reported.

Development of Effluent Limitations

IMP No.	201	**Design Flow (MGD)**	2.19
Latitude	40º 20' 13"	**Longitude**	-79º 53' 50"

Wastewater Description: IW Process Effluent with ELG, Treated Hazardous Waste Leachate, Residual Waste Leachate, Acid Seep Collection, AMD, Waste Oil Wastewater, NCCW, and Stormwater

Technology-Based Limitations

Federal Effluent Limitation Guidelines (ELGs)

IMP 201 is subject to Federal Effluent Limitation Guidelines (ELGs) under 40 CFR 420 Iron and Steel Manufacturing.

- The 64-inch Continuous Pickle Production line (Hydrochloric Acid Pickling Rinse water and one fume scrubber), which is subject to 40 CFR 420.94(b)(2) and 420.94(b)(4).

- The 84-inch Continuous Pickle Production line (Hydrochloric Acid Pickling Rinse water and one fume scrubber), which is subject to 40 CFR 420.92(b)(2) and 420.92(b)(4).

- The Continuous Annealing Line (Alkaline Cleaning of Strip), which is subject to 40 CFR 420.112(b) and 420.113(b).

- The Cold Reduction Mill (Cold Rolling of Steel in a five-stand recirculating mill), which is subject to 40 CFR 420.102(a)(2) and 420.103(a)(2).

- The No. 1 Galvanize Line (Hot Coating of Steel Strip), which is subject to 40 CFR 420.122(a)(1) and 420.123(a)(1).

- The No. 2 Galvanize Line (Alkaline Cleaning of Steel Strip, Hot Coating of Steel Strip and one fume scrubber), which is subject to 40 CFR 420.112(b), 420.113(b), 420.122(a)(1), 420.122(c), 420.123(a)(1), and 420.123(c).

- The Temper Mill (Cold Rolling of Steel in Single-stand Direct Application Mill), which is subject to 40 CFR 420.102(a)(4) and 420.103(a)(4).

Each subcategory of each production line is broken down in detail in Attachment F. The maximum monthly average production rates from the past five years was used to calculate the mass-based limitations. The mass-based limitations from the ELGs are displayed below in Table 9. The limits are the summation of all of the above subparts for each of the production lines. To ensure that the mass-based limitations are met, the concentration limits that EPA used to develop the ELGs will be imposed as well. These concentration values are from Tables I-1, I-3, and I-5 from the Iron and Steel Development Document. Because the wastewater that is discharged via IMP 201 is a combination of multiple subcategories, the most stringent concentration for a pollutant of all the subcategory is imposed. The concentrations are also displayed below in Table 9.

Table 9: ELG Limitations – IMP 201

Parameter	Average Monthly (lbs/day)	Daily Maximum (lbs/day)	Average Monthly (mg/L)	Daily Maximum (mg/L)	Instantaneous Maximum (mg/L)
Total Suspended Solids	870	1990	30.0	60.0	75.0
Oil and Grease	291	849	10.0	25.0	31.3
Total Lead	3.62	10.9	0.15	0.45	0.56
Total Zinc	4.38	13.1	0.1	0.3	0.38
Naphthalene	XXX	0.45	XXX	0.1	0.13
Tetrachloroethylene	XXX	0.67	XXX	0.15	0.19
pH (S.U.)	Not less than 6.0 nor greater than 9.0				

Water Quality-Based Limitations

Water quality-based effluent limitations will be evaluated and imposed at the receiving outfall, Outfall 001.

Anti-backsliding:

Previous effluent limits and monitoring requirements can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l) and are displayed below in Table 10. The Mass-Based limitations will be replaced with new limits based on the current production and operation. The concentration limits are from the previous permit and were developed by converting the mass-based limits at that time to concentrations by using a conversion factor or 8.34 and a flow of 2.06 MGD. The Oil and Grease concentration limits were from 25 PA Code Chapter 95.2. The pH limits were adjusted in the previous permit to be between 6.0 and 10.0 S.U. to accommodate the removal of metallic waste from the water. The pH limitations of between 6.0 and 9.0 S.U. at Outfall 001 comply with the effluent limitation guidelines for discharges from IMP 201.

Table 10: Existing Effluent Limitation for IMP 201

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum*	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/Week	Measure
Total Suspended Solids	1007	2314	XXX	58.0	132.0	165	1/Week	24-hour Composite
Oil and Grease	337	989	XXX	15.0	30.0	30.0	1/Week	3 grabs/24 hours
Lead	3.85	11.57	XXX	0.22	0.68	0.84	1/Week	24-hour Composite
Zinc	4.78	14.33	XXX	0.28	0.83	1.04	1/Week	24-hour Composite
Naphthalene	XXX	0.358	XXX	XXX	0.022	0.028	1/Quarter	24-hour Composite
Tetrachloroethylene	XXX	0.536	XXX	XXX	0.032	0.04	1/Quarter	3 grabs/24 hours
Total Iron	XXX	XXX	XXX	3.5	7.0	8.75	1/Week	24-hour Composite
pH (S.U.)	XXX	XXX	Between 6.0 and 10.0 at all times				1/Week	Grab

***Instantaneous maximum limitations are imposed to allow for a grab to be collected by the appropriate regulatory agency to determine compliance. The permittee is not required to monitor for the instantaneous maximum limitations. However, if grab samples are collected by the permittee, the results must be reported except for the results of individual grab collected by the permittee to comply with a sample type specified as 3/grabs/24 hours. These limits serve as a screening tool to assist field staff in enforcement decision-making. These limits are to be used as indicators to help determine the need for follow-up compliance inspections.

Proposed Effluent Limitations

The proposed effluent limitations for IMP 201 are displayed in Table 11 below. They are the most stringent values from the above effluent limitation development. The Mass-Based limitations have been replaced with new limits based on the current production and operation. The concentration limits for TSS, Oil and Grease, Lead, and Zinc have been replaced with the concentration limits from the Iron and Steel Development document. The concentration limits for Napthalene and Tetrachloroethylene will be carried over to the new permit from the previous permit.

Table 11: Proposed Effluent Limitation for IMP 201

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum*	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/Week	Measure
Total Suspended Solids	870	1990	XXX	30.0	60.0	75.0	1/Week	24-hour Composite
Oil and Grease	291	849	XXX	10.0	25.0	30.0	1/Week	3 grabs/24 hours
Lead	3.62	10.9	XXX	0.15	0.45	0.56	1/Week	24-hour Composite
Zinc	4.38	13.1	XXX	0.1	0.3	0.38	1/Week	24-hour Composite
Napthalene	XXX	0.45	XXX	XXX	0.022	0.028	1/Quarter	24-hour Composite
Tetrachloroethylene	XXX	0.67	XXX	XXX	0.032	0.04	1/Quarter	3 grabs/24 hours
Total Iron	XXX	XXX	XXX	3.5	7.0	8.75	1/Week	24-hour Composite
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	10.0	1/Week	Grab

*****Instantaneous maximum limitations are imposed to allow for a grab sample to be collected by the appropriate regulatory agency to determine compliance. The permittee is not required to monitor for the instantaneous maximum limitations. However, if grab samples are collected by the permittee, the results must be reported.

Development of Effluent Limitations

IMP No. 301 **Design Flow (MGD)** 0.952
Latitude 40º 20' 15" **Longitude** -79º 54' 18"
Wastewater Description: IW Process Effluent with ELG

Technology-Based Limitations

Federal Effluent Limitation Guidelines (ELGs)

IMP 301 is subject to Federal Effluent Limitation Guidelines (ELGs) under 40 CFR 420 Iron and Steel Manufacturing. The 80” Hot Strip Mill (Carbon Plate Mill Hot Forming Operations) is subject to 40 CFR 420.72(c)(1).

The production limitation calculations are broken down in detail in Attachment F. The maximum monthly average production rate from the past five years was used to calculate the mass-based limitations. The mass-based limitations from the ELGs are displayed below in Table 12. To ensure that the mass-based limitations are met, the concentration limits that EPA used to develop the ELGs will be imposed as well. These concentration values are from Table I-1 from the Iron and Steel Development Document and are also displayed below in Table 12.

Table 12: ELG Limitations

Parameter	Average Monthly (lbs/day)	Daily Maximum (lbs/day)	Average Monthly (mg/L)	Daily Maximum (mg/L)	Instantaneous Maximum (mg/L)
Total Suspended Solids	3200	8530	30.0	70.0	87.5
Oil and Grease	XXX	2140	10.0	30.0	37.5
pH (S.U.)	Not less than 6.0 nor greater than 9.0				

Regulatory Effluent Standards and Monitoring Requirements

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1).

As oil-bearing wastewaters, discharges from IMP 301 are subject to effluent standards for oil and grease from 25 Pa. Code § 95.2(2).

Effluent standards for pH are also imposed on industrial wastes by 25 Pa. Code § 95.2(1).

Table 13: Regulatory Effluent Standards and Monitoring Requirements for IMP 301

Parameter	Monthly Average	Daily Maximum	IMAX	Units
Flow	Monitor and Report		XXX	MGD
Oil & Grease	15	30	XXX	mg/L
pH	Not less than 6.0 nor greater than 9.0			S.U.

Water Quality-Based Limitations

Water quality-based effluent limitations will be evaluated and imposed at the receiving outfall, Outfall 001.

Anti-backsliding:

Previous effluent limits and monitoring requirements can be used pursuant to EPA’s anti-backsliding regulation, 40 CFR 122.44(l) and are displayed below in Table 14. The Mass-Based limitations will be replaced with new limits based on the current production and operation. The TSS concentrations were developed in a previous permit per Best Professional Judgment. The BPJ approach, considered the average discharge concentration and compared the percent recycling of the BAT technology from the ELG Development document to the percent recycling of the treatment system at the site. The Oil and Grease concentration limits were adopted from 25 PA Code Chapter 95.2.

Table 14: Existing Effluent Limitation for IMP 301

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum*	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measure
Total Suspended Solids	2818	7522	XXX	24.0	48.0	60.0	1/Week	24-hour Composite
Oil and Grease	XXX	1885	XXX	15.0	XXX	30.0	1/Week	3 grabs/24 hours
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/Week	Grab

*****Instantaneous maximum limitations are imposed to allow for a grab to be collected by the appropriate regulatory agency to determine compliance. The permittee is not required to monitor for the instantaneous maximum limitations. However, if grab samples are collected by the permittee, the results must be reported except for the results of individual grab collected by the permittee to comply with a sample type specified as 3/grabs/24 hours. These limits serve as a screening tool to assist field staff in enforcement decision-making. These limits are to be used as indicators to help determine the need for follow-up compliance inspections.

See Part C Condition No.14

Condition C.14.

The total mass load being discharged from Outfalls 301, 601, and 701 shall not exceed the following limits

Monthly Average Total Suspended Solids = 2818 ppd;
Daily Maximum Total Suspended Solids = 7522 ppd;
Daily Maximum Oil and Grease = 1885 ppd.

<u>Proposed Effluent Limitations</u>

The proposed effluent limitations for IMP 301 are displayed in Table 15 below. They are the most stringent values from the above effluent limitation development. The Mass-Based limitations have been replaced with new limits based on the current production and operation. The concentration limits for TSS will be carried over to the new permit from the previous permit. The concentration limits for Oil and Grease have been replaced with the concentration limits from the Iron and Steel Development document. Part C condition 14 of the current permit has been changed to Footnote number 4 in the Draft permit and has been updated to reflect the changes to the loading limitation.

Table 15: Proposed Effluent Limitation for IMP 301

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	Continuous	Measure
Total Suspended Solids	3200	8530	XXX	24.0	48.0	60.0	1/Week	24-hour Composite
Oil and Grease	XXX	2140	XXX	10.0	30.0	30.0	1/Week	3 grabs/24 hours
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/Week	Grab

*****Instantaneous maximum limitations are imposed to allow for a grab sample to be collected by the appropriate regulatory agency to determine compliance. The permittee is not required to monitor for the instantaneous maximum limitations. However, if grab samples are collected by the permittee, the results must be reported

Development of Effluent Limitations

IMP No. 601 **Design Flow (MGD)** Emergency Overflow
Latitude 40º 20' 17" **Longitude** -79º 54' 08"
Wastewater Description: IW Process Effluent with ELG Overflow

IMP 601 is the emergency overflow of the wastewater that would typically discharge via IMP 301, therefore the same limitations from IMP 301 will be imposed at IMP 601.

Table 16: Effluent Limitation proposed for IMP 301

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	1/Discharge	Measure
Total Suspended Solids	3200	8530	XXX	24.0	48.0	60.0	1/Discharge	Grab
Oil and Grease	XXX	2140	XXX	10.0	30.0	37.5	1/Discharge	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/Discharge	Grab

Anti-backsliding:

Previous effluent limits and monitoring requirements can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l) and are displayed below in Table 17.

Table 17: Existing Effluent Limitation for IMP 601

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/Discharge	Estimate
Total Suspended Solids	2818	7522	XXX	24.0	48.0	60.0	1/Discharge	Grab
Oil and Grease	XXX	1885	XXX	15.0	XXX	30.0	1/Discharge	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/Discharge	Grab

See Part C Condition No.14

Condition C.14.

The total mass load being discharged from Outfalls 301, 601, and 701 shall not exceed the following limits

Monthly Average Total Suspended Solids = 2818 ppd;
Daily Maximum Total Suspended Solids = 7522 ppd;
Daily Maximum Oil and Grease = 1885 ppd.

Proposed Effluent Limitations

The proposed effluent limitations for IMP 601 are displayed in Table 18 below, they are the most stringent values from the above effluent limitation development. Part C condition 14 of the current permit has been changed to Footnote number 4 in the Draft permit and has been updated to reflect the changes to the loading limitation.

Table 18: Proposed Effluent Limitation for IMP 601

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum*	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/Discharge	Estimate
Total Suspended Solids	3200	8530	XXX	24.0	48.0	60.0	1/Discharge	Grab
Oil and Grease	XXX	2140	XXX	10.0	30.0	30.0	1/Discharge	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/Discharge	Grab

Development of Effluent Limitations

IMP No.	701	**Design Flow (MGD)**	Emergency Overflow
Latitude	40º 20' 11"	**Longitude**	-79º 54' 09"
Wastewater Description:	IW Process Effluent with ELG Overflow		

IMP 701 is the emergency overflow of wastewater that would typically discharge via IMP 301, therefore the limitations from IMP 301 will be imposed at IMP 701.

Table 19: Effluent Limitation proposed for IMP 301

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum*	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/Discharge	Measure
Total Suspended Solids	3200	8530	XXX	24.0	48.0	60.0	1/Discharge	Grab
Oil and Grease	XXX	2140	XXX	10.0	30.0	37.5	1/Discharge	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/Discharge	Grab

Anti-backsliding:

Previous effluent limits and monitoring requirements can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l) and are displayed below in Table 20.

Table 20: Existing Effluent Limitation for IMP 701

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/Discharge	Estimate
Total Suspended Solids	2818	7522	XXX	24.0	48.0	60.0	1/Discharge	Grab
Oil and Grease	XXX	1885	XXX	15.0	XXX	30.0	1/Discharge	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/Discharge	Grab

See Part C Condition No.14

Condition C.14.

The total mass load being discharged from Outfalls 301, 601, and 701 shall not exceed the following limits

Monthly Average Total Suspended Solids = 2818 ppd;
Daily Maximum Total Suspended Solids = 7522 ppd;
Daily Maximum Oil and Grease = 1885 ppd**.**

Proposed Effluent Limitations

The proposed effluent limitations for IMP 701 are displayed in Table 21 below, they are the most stringent values from the above effluent limitation development. Part C condition 14 of the current permit has been changed to Footnote number 4 in the Draft permit and has been updated to reflect the changes to the loading limitation.

Table 21: Proposed Effluent Limitation for IMP 701

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	1/Discharge	Estimate
Total Suspended Solids	3200	8530	XXX	24.0	48.0	60.0	1/Discharge	Grab
Oil and Grease	XXX	2140	XXX	10.0	30.0	30.0	1/Discharge	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/Discharge	Grab

Development of Effluent Limitations

Outfall No.	002	**Design Flow (MGD)**	Varies
Latitude	40º 20' 2.5"	**Longitude**	-79º 53' 48.2"
Wastewater Description:	Travel Screen Backwash		

The following statement from the current permit will remain in Part A of the new permit:

> The material (solids and other debris) physically or mechanically removed by USS in the backwash operation shall not be returned to surface waters. The disposal of this material shall prevent any discharge of removed substance to surface waters.

Development of Effluent Limitations

Outfall No. 003 **Design Flow (MGD)** 1.72
Latitude 40º 19' 44.2" **Longitude** -79º 53' 59.9"
Wastewater Description: NCCW, Boiler Blowdown, and Stormwater

Technology-Based Limitations

Regulatory Effluent Standards and Monitoring Requirements

25 PA Code Chapter 92 requires pH to be a minimum of 6.0 and a maximum of 9.0 S.U. for all industrial waste process and non-process discharges.

Flow reporting requirements are in accordance with the 25 PA Code Chapter 92 regulations.

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.

Although the sample results in the updated permit application indicate that the oil and grease concentrations from the discharge of Outfall 003 are non-detect, there have been multiple instances where the Department has noted an oily sheen from the discharge of Outfall 003. Therefore, the effluent standards for oil and grease from 25 Pa. Code § 95.2(2) will be imposed at Outfall 003.

Temperature limits will be imposed per the Department's "*Implementation Guidance for Temperature Criteria*." As a policy, DEP normally imposes a maximum temperature limit of 110°F on discharges that contain residual heat. The limit is intended as a safety measure to protect sampling personnel or anyone who may come into contact with the heated discharge where it enters the receiving water.

Table 22: Regulatory Effluent Standards and Monitoring Requirements for Outfall 003

Parameter	Monthly Average	Daily Maximum	Instantaneous Maximum	Units
Flow	Monitor and Report		-	MGD
Total Residual Chlorine	0.5	1.0	-	mg/L
Oil and Grease	15.0	30.0		mg/L
Temperature	-	-	110	°F
pH	Between 6.0 and 9.0			S.U.

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 003

Discharges from Outfall 003 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 23. 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 G 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 24.

Table 23: TMS Inputs for Outfall 003

Parameter	Value
River Mile Index	18.1
Discharge Flow (MGD)	1.72
Parameter	
Area in Square Miles	5,410
Q_{7-10} (cfs)	550
Low-flow yield (cfs/mi^2)	0.102
Elevation (ft)	712
Slope	0.0001

Table 24: Water Quality Based Effluent Limitations at Outfall 003

Parameters	Average Monthly	Daily Maximum	Discharge Concentration
Butyl Benzyl Phthalate (µg/L)	Report	Report	4.3

Thermal WQBELs for Heated Discharges

Thermal WQBELs are evaluated using DEP's "Thermal Discharge Limit Calculation Spreadsheet" created with Microsoft Excel for Windows. The program calculates temperature WLAs through the application of a heat transfer equation, which takes two forms in the program depending on the source of the facility's cooling water. In Case 1, intake water to a facility is from the receiving stream. In Case 2, intake water is from a source other than the receiving stream (e.g., municipal water supply). The determination of which case applies to a given discharge is determined by the input data which include the receiving stream flow rate (Q_{7-10} or the minimum regulated flow for large rivers), the stream intake flow rate, external source intake flow rates, consumptive flow rates and site-specific ambient stream temperatures. Case 1 limits are generally expressed as heat rejection rates while Case 2 limits are usually expressed as temperatures.

Since the temperature criteria from 25 Pa. Code Chapter 93.7(a) are expressed on monthly and semi-monthly bases for three different aquatic life-uses—cold water fishes, warm water fishes and trout stocking—the program generates monthly and semi-monthly limits for each use. DEP selects the output that corresponds to the aquatic life-use of the receiving stream and consequently which limits apply to the discharge. Temperature WLAs are bounded by an upper limit of 110°F for the safety of sampling personnel and anyone who may come into contact with the heated discharge where it enters the receiving water. If no WLAs below 110°F are calculated, an instantaneous maximum limit of 110°F is recommended by the program.

Due to the nature of the discharges and their relative locations on the receiving stream, all heated discharges will be evaluated as one discharge to ensure the temperature criteria is met instream from all of the heated discharges and a combined flow of 25.32 MGD was used in the model. Discharges from Outfall 001 and Outfall 003 are classified under Case 1 because water is obtained via an intake structure owned by the permittee on the Monongahela River. The results of the thermal analysis, included in Attachment E, indicate that no WQBELs for temperature are required at Outfall 003. Therefore, the 110°F daily maximum temperature limit will be imposed at Outfall 003.

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 H, indicate that no WQBELs are required for TRC.

Anti-backsliding:

Previous effluent limits and monitoring requirements can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l) and are displayed below in Table 25.

Table 25: Existing Effluent Limitation for Outfall 003

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/Week	Estimate
Temperature (°F)*	XXX	XXX	XXX	XXX	110	XXX	1/Week	I-S
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/Week	Grab

***** There shall be no net addition of pollutants to non-contact cooling water over intake values except for heart and water conditioning additivities for which complete information was submitted in the appellation of is required to be submitted as a condition of this permit.

For the purpose of determining compliance with any maximum daily temperature limitations in apart A of this permit and notwithstanding A.2.o of this permit, the temperature value shall consist of the average of three (30 individual immersion stabilization temperature measurements over a twenty-four hour period. The individual temperate measurement shall be taken at equal internals over the period as is practical and in no case shall any two individual temperature measurements be taken at less than a one (1) hour interval.

Proposed Effluent Limitations

The proposed effluent limitations for Outfall 003 are displayed in Table 26, they are the most stringent values from the above effluent limitation development.

Table 26: Proposed Final Effluent Limitations for Outfall 003

Parameter	Instantaneous Minimum	Average Monthly	Daily Maximum	Instantaneous Maximum	Sample Frequency	Sample Type
Flow (MGD)	XXX	Report	Report	XXX	1/Week	Estimate
Temperature (°F)	XXX	XXX	XXX	110	1/Week	I-S
Total Residual Chlorine (mg/l)	XXX	0.5	1.0	1.25	1/Week	Grab
Oil and Grease	XXX	15.0	30.0	XXX	1/Week	Grab
Butyl Benzyl Phthalate	XXX	Report	Report	XXX	1/Week	Grab
pH (S.U.)	6.0	XXX	XXX	9.0	1/Week	Grab

Development of Effluent Limitations

Outfall No. 004 **Design Flow (MGD)** Varies
Latitude 40º 19' 51.5" **Longitude** -79º 53' 52.4"
Wastewater Description: Stormwater

Stormwater Technology Limits

Outfall 004 will be subject to PAG-03 General Stormwater Permit conditions as a minimum requirement because the outfall discharges stormwater associated with industrial activity. The SIC code for the site is 3312 and the corresponding appendix of the PAG-03 that would apply to the facility is Appendix B. The reporting requirements applicable to stormwater discharges are shown in Table 27 below.

Table 27: PAG-03 Appendix (B) Monitoring Requirements

Parameter	Max Daily Concentration	Measurement Frequency	Sample Type
Total Nitrogen*	Monitor and Report	1/6 Months	Grab
Total Phosphorus	Monitor and Report	1/6 Months	Grab
Total Suspended Solids (TSS)	Monitor and Report	1/6 Months	Grab
Oil and Grease	Monitor and Report	1/6 Months	Grab
Total Aluminum	Monitor and Report	1/6 Months	Grab
Total Zinc	Monitor and Report	1/6 Months	Grab
Total Copper	Monitor and Report	1/6 Months	Grab
Total Iron	Monitor and Report	1/6 Months	Grab
Total Lead	Monitor and Report	1/6 Months	Grab

*Total Nitrogen is the sum of Total Kjeldahl-N (TKN) plus Nitrite-Nitrate as N (NO_2+NO_3-N), where TKN and NO_2+NO_3-N are measured in the same sample.

Water Quality-Based Limitations

Stormwater WQBELs

Water quality analyses are typically performed under low-flow (Q7-10) conditions. Stormwater discharges occur at variable rates and frequencies but not however during Q7-10 conditions. Since the discharges from Outfall 004 are composed entirely of stormwater, a formal water quality analysis cannot be accurately conducted. Accordingly, water quality-based effluent limitations based on water quality analyses are not proposed.

Anti-backsliding:

No limits were imposed on Outfall 004 in the previous permit.

Proposed Effluent Limitations and Monitoring Requirements

The proposed effluent monitoring requirements for Outfall 004 are displayed in Table 28 below, they are the most stringent values from the above effluent limitation development. The Draft Permit requires a Corrective Action Plan when there are two consecutive exceedances of the benchmark values, which are also included in the Part C condition. The benchmark values are displayed below in Table 28. These values are not effluent limitations, an exceedance of the benchmark value is not a violation. As described above, if there are two consecutive exceedances of the benchmark value, a corrective action plan must be conducted to evaluate site stormwater controls and BMPs. Benchmark monitoring is a feedback tool, along with routine inspections and visual assessments, for assessing the effectiveness of stormwater controls and BMPs. An exceedance of the benchmark provides permittees with an indication that the facility's controls may not be sufficiently controlling pollutants in stormwater.

Table 28: Proposed Effluent Monitoring Requirements – Outfall 004

Parameter	Max Daily Concentration	Benchmark Values (mg/L)	Measurement Frequency	Sample Type
Total Nitrogen	Report	XXX	1/6 Months	Calculation
Total Phosphorus	Report	XXX	1/6 Months	Grab
Total Suspended Solids (TSS)	Report	100	1/6 Months	Grab
Oil and Grease	Report	30	1/6 Months	Grab
Total Aluminum	Report	XXX	1/6 Months	Grab
Total Zinc	Report	XXX	1/6 Months	Grab
Total Copper	Report	XXX	1/6 Months	Grab
Total Iron	Report	XXX	1/6 Months	Grab
Total Lead	Report	XXX	1/6 Months	Grab

Development of Effluent Limitations

Outfall No. 005 **Design Flow (MGD)** Varies
Latitude 40º 20' 27.3" **Longitude** -79º 54' 5.9"
Wastewater Description: Stormwater

Stormwater Technology Limits

Outfall 005 will be subject to PAG-03 General Stormwater Permit conditions as a minimum requirement because the outfall discharges stormwater associated with industrial activity. The SIC code for the site is 3312 and the corresponding appendix of the PAG-03 that would apply to the facility is Appendix B. The reporting requirements applicable to stormwater discharges are shown in Table 29 below.

Table 29: PAG-03 Appendix (B) Monitoring Requirements

Parameter	Max Daily Concentration	Measurement Frequency	Sample Type
Total Nitrogen*	Monitor and Report	1/6 Months	Grab
Total Phosphorus	Monitor and Report	1/6 Months	Grab
Total Suspended Solids (TSS)	Monitor and Report	1/6 Months	Grab
Oil and Grease	Monitor and Report	1/6 Months	Grab
Total Aluminum	Monitor and Report	1/6 Months	Grab
Total Zinc	Monitor and Report	1/6 Months	Grab
Total Copper	Monitor and Report	1/6 Months	Grab
Total Iron	Monitor and Report	1/6 Months	Grab
Total Lead	Monitor and Report	1/6 Months	Grab

*Total Nitrogen is the sum of Total Kjeldahl-N (TKN) plus Nitrite-Nitrate as N (NO_2+NO_3-N), where TKN and NO_2+NO_3-N are measured in the same sample.

Water Quality-Based Limitations

Stormwater WQBELs

Water quality analyses are typically performed under low-flow (Q7-10) conditions. Stormwater discharges occur at variable rates and frequencies but not however during Q7-10 conditions. Since the discharges from Outfall 005 are composed entirely of stormwater, a formal water quality analysis cannot be accurately conducted. Accordingly, water quality-based effluent limitations based on water quality analyses are not proposed.

Anti-backsliding:

No limits were imposed on Outfall 005 in the previous permit.

Proposed Effluent Limitations and Monitoring Requirements

The proposed effluent monitoring requirements for Outfall 005 are displayed in Table 30 below, they are the most stringent values from the above effluent limitation development. The Draft Permit requires a Corrective Action Plan when there are two consecutive exceedances of the benchmark values, which are also included in the Part C condition. The benchmark values are displayed below in Table 30. These values are not effluent limitations, an exceedance of the benchmark value is not a violation. As described above, if there are two consecutive exceedances of the benchmark value, a Corrective Action Plan must be conducted to evaluate site stormwater controls and BMPs. Benchmark monitoring is a feedback tool, along with routine inspections and visual assessments, for assessing the effectiveness of stormwater controls and BMPs. An exceedance of the benchmark provides permittees with an indication that the facility's controls may not be sufficiently controlling pollutants in stormwater.

Table 30: Proposed Effluent Monitoring Requirements – Outfall 005

Parameter	Max Daily Concentration	Benchmark Values (mg/L)	Measurement Frequency	Sample Type
Total Nitrogen	Report	XXX	1/6 Months	Calculation
Total Phosphorus	Report	XXX	1/6 Months	Grab
Total Suspended Solids (TSS)	Report	100	1/6 Months	Grab
Oil and Grease	Report	30	1/6 Months	Grab
Total Aluminum	Report	XXX	1/6 Months	Grab
Total Zinc	Report	XXX	1/6 Months	Grab
Total Copper	Report	XXX	1/6 Months	Grab
Total Iron	Report	XXX	1/6 Months	Grab
Total Lead	Report	XXX	1/6 Months	Grab

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **D**)
☒	Toxics Management Spreadsheet (see Attachment **B and G**)
☒	TRC Model Spreadsheet (see Attachment **C and H**)
☒	Temperature Model Spreadsheet (see Attachment **E**)
☐	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: StreamStats Report

Attachment B: Outfall 001 Toxics Management Spreadsheet Evaluation

Attachment C: Outfall 001 TRC Spreadsheet Evaluation

Attachment D: Outfall 001 WQM7.0 Model Run

Attachment E: Site Temperature Model Spreadsheet Evaluation

Attachment F: Effluent Limitation Guidelines Calculations

Attachment G: Outfall 003 Toxics Management Spreadsheet Evaluation

Attachment H: Outfall 003 TRC Spreadsheet Evaluation

Attachment I: Site Flow Diagrams

Attachment A:

StreamStats Report

StreamStats Report

Region ID: PA
Workspace ID: PA20220302192820361000
Clicked Point (Latitude, Longitude): 40.33691, -79.89389
Time: 2022-03-02 14:28:46 -0500

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	5410	square miles
ELEV	Mean Basin Elevation	1814	feet
PRECIP	Mean Annual Precipitation	47	inches
FOREST	Percentage of area covered by forest	75.749	percent
URBAN	Percentage of basin with urban development	3.1205	percent

Annual Flow Statistics Parameters [99.9 Percent (5410 square miles) Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5410	square miles	2.26	1720
ELEV	Mean Basin Elevation	1814	feet	130	2700
PRECIP	Mean Annual Precipitation	47	inches	33.1	50.4
FOREST	Percent Forest	75.749	percent	5.1	100
URBAN	Percent Urban	3.1205	percent	0	89

Annual Flow Statistics Disclaimers [99.9 Percent (5410 square miles) Statewide Mean and Base Flow]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Annual Flow Statistics Flow Report [99.9 Percent (5410 square miles) Statewide Mean and Base Flow]

Statistic	Value	Unit
Mean Annual Flow	11300	ft^3/s

Annual 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:

Outfall 001 Toxics Management Spreadsheet Evaluation

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **USS Mon Valley Irvin Plant**   NPDES Permit No.: **PA0004073**   Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste**   Wastewater Description: **IW ELG, Sewage, NCCW, Boiler Blowdown**

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
23.6	160	7						

	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc (0 if left blank)	Stream Conc (0 if left blank)	Daily CV (0.5 if left blank)	Hourly CV (0.5 if left blank)	Stream CV (0 if left blank)	Fate Coeff (0 if left blank)	FOS (0 if left blank)	Criteria Mod (1 if left blank)	Chem Transl (1 if left blank)
Group 1	Total Dissolved Solids (PWS)	mg/L		340									
	Chloride (PWS)	mg/L		70.8									
	Bromide	mg/L		1.3									
	Sulfate (PWS)	mg/L		75.6									
	Fluoride (PWS)	mg/L	<	0.22									
Group 2	Total Aluminum	µg/L		1750									
	Total Antimony	µg/L		0.42									
	Total Arsenic	µg/L	<	1									
	Total Barium	µg/L		49									
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L		46									
	Total Cadmium	µg/L	<	0.16									
	Total Chromium (III)	µg/L		3.9									
	Hexavalent Chromium	µg/L		3.9									
	Total Cobalt	µg/L		3.71									
	Total Copper	µg/L		5.27									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	10									
	Dissolved Iron	µg/L		116									
	Total Iron	µg/L		4290									
	Total Lead	µg/L		3.7									
	Total Manganese	µg/L		242									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		9.1									
	Total Phenols (Phenolics) (PWS)	µg/L		13									
	Total Selenium	µg/L	<	2									
	Total Silver	µg/L	<	0.144									
	Total Thallium	µg/L	<	1									
	Total Zinc	µg/L		43.6									
	Total Molybdenum	µg/L	<	2.37									
	Acrolein	µg/L	<	1.3									
	Acrylamide	µg/L	<	0.011									
	Acrylonitrile	µg/L	<	2									
	Benzene	µg/L	<	0.12									
	Bromoform	µg/L	<	0.37									

Group 3	Carbon Tetrachloride	µg/L	<	0.23									
	Chlorobenzene	µg/L		0.25									
	Chlorodibromomethane	µg/L	<	0.6									
	Chloroethane	µg/L	<	0.27									
	2-Chloroethyl Vinyl Ether	µg/L	<	3.1									
	Chloroform	µg/L		3.4									
	Dichlorobromomethane	µg/L		1.7									
	1,1-Dichloroethane	µg/L	<	0.05									
	1,2-Dichloroethane	µg/L	<	0.12									
	1,1-Dichloroethylene	µg/L	<	0.13									
	1,2-Dichloropropane	µg/L	<	0.26									
	1,3-Dichloropropylene	µg/L	<	0.47									
	1,4-Dioxane	µg/L		0.4									
	Ethylbenzene	µg/L	<	0.2									
	Methyl Bromide	µg/L	<	0.42									
	Methyl Chloride	µg/L	<	0.33									
	Methylene Chloride	µg/L	<	0.14									
	1,1,2,2-Tetrachloroethane	µg/L	<	0.38									
	Tetrachloroethylene	µg/L	<	0.27									
	Toluene	µg/L	<	0.24									
	1,2-trans-Dichloroethylene	µg/L	<	0.08									
	1,1,1-Trichloroethane	µg/L	<	0.12									
	1,1,2-Trichloroethane	µg/L	<	0.13									
	Trichloroethylene	µg/L	<	0.29									
	Vinyl Chloride	µg/L	<	0.33									
Group 4	2-Chlorophenol	µg/L	<	0.38									
	2,4-Dichlorophenol	µg/L	<	0.43									
	2,4-Dimethylphenol	µg/L	<	0.46									
	4,6-Dinitro-o-Cresol	µg/L	<	0.97									
	2,4-Dinitrophenol	µg/L	<	0.97									
	2-Nitrophenol	µg/L	<	0.38									
	4-Nitrophenol	µg/L	<	0.97									
	p-Chloro-m-Cresol	µg/L	<	0.38									
	Pentachlorophenol	µg/L	<	1.7									
	Phenol	µg/L		5									
	2,4,6-Trichlorophenol	µg/L	<	0.46									
Group 5	Acenaphthene	µg/L	<	0.39									
	Acenaphthylene	µg/L	<	0.38									
	Anthracene	µg/L	<	0.39									
	Benzidine	µg/L	<	2.5									
	Benzo(a)Anthracene	µg/L	<	0.4									
	Benzo(a)Pyrene	µg/L	<	0.35									
	3,4-Benzofluoranthene	µg/L	<	0.39									
	Benzo(ghi)Perylene	µg/L	<	0.41									
	Benzo(k)Fluoranthene	µg/L	<	0.38									
	Bis(2-Chloroethoxy)Methane	µg/L	<	0.43									
	Bis(2-Chloroethyl)Ether	µg/L	<	0.37									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	0.43									
	Bis(2-Ethylhexyl)Phthalate	µg/L		2.6									
	4-Bromophenyl Phenyl Ether	µg/L	<	0.44									
	Butyl Benzyl Phthalate	µg/L	<	0.57									
	2-Chloronaphthalene	µg/L	<	0.39									
	4-Chlorophenyl Phenyl Ether	µg/L	<	0.39									
	Chrysene	µg/L	<	0.41									
	Dibenzo(a,h)Anthrancene	µg/L	<	0.42									
	1,2-Dichlorobenzene	µg/L	<	0.37									
	1,3-Dichlorobenzene	µg/L	<	0.43									
	1,4-Dichlorobenzene	µg/L	<	0.43									
	3,3-Dichlorobenzidine	µg/L	<	1									
	Diethyl Phthalate	µg/L		2									
	Dimethyl Phthalate	µg/L	<	0.41									
	Di-n-Butyl Phthalate	µg/L	<	0.56									
	2,4-Dinitrotoluene	µg/L	<	0.44									

2,6-Dinitrotoluene	µg/L	<	0.4									
Di-n-Octyl Phthalate	µg/L	<	0.86									
1,2-Diphenylhydrazine	µg/L	<	0.37									
Fluoranthene	µg/L	<	0.42									
Fluorene	µg/L	<	0.37									
Hexachlorobenzene	µg/L	<	0.42									
Hexachlorobutadiene	µg/L	<	0.48									
Hexachlorocyclopentadiene	µg/L	<	0.72									
Hexachloroethane	µg/L	<	0.36									
Indeno(1,2,3-cd)Pyrene	µg/L	<	0.39									
Isophorone	µg/L	<	0.42									
Naphthalene	µg/L	<	0.39									
Nitrobenzene	µg/L	<	0.51									
n-Nitrosodimethylamine	µg/L	<	1.1									
n-Nitrosodi-n-Propylamine	µg/L	<	0.41									
n-Nitrosodiphenylamine	µg/L	<	0.48									
Phenanthrene	µg/L	<	0.38									
Pyrene	µg/L	<	0.41									
1,2,4-Trichlorobenzene	µg/L	<	0.41									

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

USS Mon Valley Irvin Plant, NPDES Permit No. PA0004073, 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	17.53	712	5410			Yes
End of Reach 1	037185	16	710	5411			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	17.53	0.1	550			850	12					100	7		
End of Reach 1	16	0.1	550			850	12								

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	17.53														
End of Reach 1	16														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

USS Mon Valley Irvin Plant, NPDES Permit No. PA0004073, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.106 Analysis Hardness (mg/l): 123.09 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	1,949	
Total Antimony	0	0		0	1,100	1,100	2,859	
Total Arsenic	0	0		0	340	340	884	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	54,579	
Total Boron	0	0		0	8,100	8,100	21,052	
Total Cadmium	0	0		0	2.464	2.63	6.85	Chem Translator of 0.935 applied
Total Chromium (III)	0	0		0	675.422	2,137	5,555	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	42.3	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	247	
Total Copper	0	0		0	16.344	17.0	44.2	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	80.909	106	276	Chem Translator of 0.761 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	4.28	Chem Translator of 0.85 applied
Total Nickel	0	0		0	558.188	559	1,454	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	4.598	5.41	14.1	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	169	
Total Zinc	0	0		0	139.730	143	371	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	7.8	

Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	650	650	1,689	
Benzene	0	0		0	640	640	1,663	
Bromoform	0	0		0	1,800	1,800	4,678	
Carbon Tetrachloride	0	0		0	2,800	2,800	7,277	
Chlorobenzene	0	0		0	1,200	1,200	3,119	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	46,782	
Chloroform	0	0		0	1,900	1,900	4,938	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	38,985	
1,1-Dichloroethylene	0	0		0	7,500	7,500	19,492	
1,2-Dichloropropane	0	0		0	11,000	11,000	28,589	
1,3-Dichloropropylene	0	0		0	310	310	806	
Ethylbenzene	0	0		0	2,900	2,900	7,537	
Methyl Bromide	0	0		0	550	550	1,429	
Methyl Chloride	0	0		0	28,000	28,000	72,772	
Methylene Chloride	0	0		0	12,000	12,000	31,188	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	2,599	
Tetrachloroethylene	0	0		0	700	700	1,819	
Toluene	0	0		0	1,700	1,700	4,418	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	17,673	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	7,797	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	8,837	
Trichloroethylene	0	0		0	2,300	2,300	5,978	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	1,455	
2,4-Dichlorophenol	0	0		0	1,700	1,700	4,418	
2,4-Dimethylphenol	0	0		0	660	660	1,715	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	208	
2,4-Dinitrophenol	0	0		0	660	660	1,715	
2-Nitrophenol	0	0		0	8,000	8,000	20,792	
4-Nitrophenol	0	0		0	2,300	2,300	5,978	
p-Chloro-m-Cresol	0	0		0	160	160	416	
Pentachlorophenol	0	0		0	8.723	8.72	22.7	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	1,196	
Acenaphthene	0	0		0	83	83.0	216	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	780	
Benzo(a)Anthracene	0	0		0	0.5	0.5	1.3	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	77,970	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	11,695	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	702	

Butyl Benzyl Phthalate	0	0		0	140	140	364	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	2,131	
1,3-Dichlorobenzene	0	0		0	350	350	910	
1,4-Dichlorobenzene	0	0		0	730	730	1,897	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	10,396	
Dimethyl Phthalate	0	0		0	2,500	2,500	6,497	
Di-n-Butyl Phthalate	0	0		0	110	110	286	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	4,158	
2,6-Dinitrotoluene	0	0		0	990	990	2,573	
1,2-Diphenylhydrazine	0	0		0	15	15.0	39.0	
Fluoranthene	0	0		0	200	200	520	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	26.0	
Hexachlorocyclopentadiene	0	0		0	5	5.0	13.0	
Hexachloroethane	0	0		0	60	60.0	156	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	25,990	
Naphthalene	0	0		0	140	140	364	
Nitrobenzene	0	0		0	4,000	4,000	10,396	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	44,183	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	780	
Phenanthrene	0	0		0	5	5.0	13.0	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	338	

☑ *CFC* CCT (min): 720 PMF: 0.735 Analysis Hardness (mg/l): 104.97 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	2,657	
Total Arsenic	0	0		0	150	150	1,812	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	49,521	
Total Boron	0	0		0	1,600	1,600	19,325	
Total Cadmium	0	0		0	0.254	0.28	3.39	Chem Translator of 0.907 applied
Total Chromium (III)	0	0		0	77.117	89.7	1,083	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	126	Chem Translator of 0.962 applied

Total Cobalt	0	0		0	19	19.0	229	
Total Copper	0	0		0	9.335	9.72	117	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	24,097	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.653	3.38	40.9	Chem Translator of 0.784 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	10.9	Chem Translator of 0.85 applied
Total Nickel	0	0		0	54.184	54.3	656	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	60.3	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	157	
Total Zinc	0	0		0	123.093	125	1,508	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	36.2	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	130	130	1,570	
Benzene	0	0		0	130	130	1,570	
Bromoform	0	0		0	370	370	4,469	
Carbon Tetrachloride	0	0		0	560	560	6,764	
Chlorobenzene	0	0		0	240	240	2,899	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	42,274	
Chloroform	0	0		0	390	390	4,710	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	37,442	
1,1-Dichloroethylene	0	0		0	1,500	1,500	18,117	
1,2-Dichloropropane	0	0		0	2,200	2,200	26,572	
1,3-Dichloropropylene	0	0		0	61	61.0	737	
Ethylbenzene	0	0		0	580	580	7,005	
Methyl Bromide	0	0		0	110	110	1,329	
Methyl Chloride	0	0		0	5,500	5,500	66,430	
Methylene Chloride	0	0		0	2,400	2,400	28,988	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	2,536	
Tetrachloroethylene	0	0		0	140	140	1,691	
Toluene	0	0		0	330	330	3,986	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	16,909	
1,1,1-Trichloroethane	0	0		0	610	610	7,368	
1,1,2-Trichloroethane	0	0		0	680	680	8,213	
Trichloroethylene	0	0		0	450	450	5,435	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	1,329	
2,4-Dichlorophenol	0	0		0	340	340	4,107	
2,4-Dimethylphenol	0	0		0	130	130	1,570	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	193	
2,4-Dinitrophenol	0	0		0	130	130	1,570	

2-Nitrophenol	0	0		0	1,600	1,600	19,325	
4-Nitrophenol	0	0		0	470	470	5,677	
p-Chloro-m-Cresol	0	0		0	500	500	6,039	
Pentachlorophenol	0	0		0	6.693	6.69	80.8	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	1,099	
Acenaphthene	0	0		0	17	17.0	205	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	713	
Benzo(a)Anthracene	0	0		0	0.1	0.1	1.21	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	72,469	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	10,991	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	652	
Butyl Benzyl Phthalate	0	0		0	35	35.0	423	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	1,933	
1,3-Dichlorobenzene	0	0		0	69	69.0	833	
1,4-Dichlorobenzene	0	0		0	150	150	1,812	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	9,663	
Dimethyl Phthalate	0	0		0	500	500	6,039	
Di-n-Butyl Phthalate	0	0		0	21	21.0	254	
2,4-Dinitrotoluene	0	0		0	320	320	3,865	
2,6-Dinitrotoluene	0	0		0	200	200	2,416	
1,2-Diphenylhydrazine	0	0		0	3	3.0	36.2	
Fluoranthene	0	0		0	40	40.0	483	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	24.2	
Hexachlorocyclopentadiene	0	0		0	1	1.0	12.1	
Hexachloroethane	0	0		0	12	12.0	145	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	25,364	
Naphthalene	0	0		0	43	43.0	519	
Nitrobenzene	0	0		0	810	810	9,783	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	41,066	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	713	
Phenanthrene	0	0		0	1	1.0	12.1	

Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	314	

☑ ***THH*** CCT (min): 720 PMF: 0.735 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	67.6	
Total Arsenic	0	0		0	10	10.0	121	
Total Barium	0	0		0	2,400	2,400	28,988	
Total Boron	0	0		0	3,100	3,100	37,442	
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	3,623	
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	12,078	
Total Mercury	0	0		0	0.050	0.05	0.6	
Total Nickel	0	0		0	610	610	7,368	
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	2.9	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	36.2	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	1,208	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	68.8	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	399	

1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	821	
Methyl Bromide	0	0		0	100	100.0	1,208	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	688	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	1,208	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	120,782	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	362	
2,4-Dichlorophenol	0	0		0	10	10.0	121	
2,4-Dimethylphenol	0	0		0	100	100.0	1,208	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	24.2	
2,4-Dinitrophenol	0	0		0	10	10.0	121	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	48,313	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	845	
Anthracene	0	0		0	300	300	3,623	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	2,416	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	1.21	
2-Chloronaphthalene	0	0		0	800	800	9,663	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	12,078	
1,3-Dichlorobenzene	0	0		0	7	7.0	84.5	
1,4-Dichlorobenzene	0	0		0	300	300	3,623	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	7,247	

Dimethyl Phthalate	0	0		0	2,000	2,000	24,156	
Di-n-Butyl Phthalate	0	0		0	20	20.0	242	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	242	
Fluorene	0	0		0	50	50.0	604	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	48.3	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	411	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	121	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	242	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.85	

☑ *CRL* CCT (min): ###### 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	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylamide	0	0		0	0.07	0.07	3.61	
Acrylonitrile	0	0		0	0.06	0.06	3.09	
Benzene	0	0		0	0.58	0.58	29.9	
Bromoform	0	0		0	7	7.0	361	
Carbon Tetrachloride	0	0		0	0.4	0.4	20.6	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	41.2	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.95	0.95	49.0	
1,2-Dichloroethane	0	0		0	9.9	9.9	510	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	46.4	
1,3-Dichloropropylene	0	0		0	0.27	0.27	13.9	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methyl Bromide	0	0		0	N/A	N/A	N/A	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	20	20.0	1,031	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	10.3	
Tetrachloroethylene	0	0		0	10	10.0	515	
Toluene	0	0		0	N/A	N/A	N/A	
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	28.3	
Trichloroethylene	0	0		0	0.6	0.6	30.9	
Vinyl Chloride	0	0		0	0.02	0.02	1.03	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A	
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	1.55	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	77.3	
Acenaphthene	0	0		0	N/A	N/A	N/A	

Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.0001	0.0001	0.005	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.052	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.005	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.052	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	0.52	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	1.55	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	16.5	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.12	0.12	6.19	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.005	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	2.58	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	2.58	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	2.58	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	1.55	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.004	
Hexachlorobutadiene	0	0		0	0.01	0.01	0.52	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	5.15	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.052	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.036	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.26	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	170	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	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
Total Aluminum	246	384	1,249	1,949	3,123	µg/L	1,249	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Hexavalent Chromium	Report	Report	Report	Report	Report	µg/L	27.1	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	28.4	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Iron	Report	Report	Report	Report	Report	µg/L	24,097	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	238	AFC	Discharge Conc > 10% WQBEL (no 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
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 Antimony	67.6	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	28,988	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	13,493	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	3.39	µg/L	Discharge Conc < TQL
Total Chromium (III)	1,083	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	158	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	3,623	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	40.9	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	12,078	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.6	µg/L	Discharge Conc < TQL
Total Nickel	656	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	60.3	µg/L	Discharge Conc < TQL
Total Silver	9.01	µg/L	Discharge Conc < TQL
Total Thallium	2.9	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	5.0	µg/L	Discharge Conc < TQL
Acrylamide	3.61	µg/L	Discharge Conc < TQL
Acrylonitrile	3.09	µg/L	Discharge Conc < TQL
Benzene	29.9	µg/L	Discharge Conc < TQL
Bromoform	361	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	20.6	µg/L	Discharge Conc < TQL

Chlorobenzene	1,208	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	41.2	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	29,985	µg/L	Discharge Conc < TQL
Chloroform	68.8	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	49.0	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	510	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	399	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	46.4	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	13.9	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	821	µg/L	Discharge Conc < TQL
Methyl Bromide	916	µg/L	Discharge Conc < TQL
Methyl Chloride	46,644	µg/L	Discharge Conc < TQL
Methylene Chloride	1,031	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	10.3	µg/L	Discharge Conc < TQL
Tetrachloroethylene	515	µg/L	Discharge Conc < TQL
Toluene	688	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	1,208	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	4,998	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	28.3	µg/L	Discharge Conc < TQL
Trichloroethylene	30.9	µg/L	Discharge Conc < TQL
Vinyl Chloride	1.03	µg/L	Discharge Conc < TQL
2-Chlorophenol	362	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	121	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	1,099	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	24.2	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	121	µg/L	Discharge Conc < TQL
2-Nitrophenol	13,327	µg/L	Discharge Conc < TQL
4-Nitrophenol	3,831	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	267	µg/L	Discharge Conc < TQL
Pentachlorophenol	1.55	µg/L	Discharge Conc < TQL
Phenol	48,313	µg/L	Discharge Conc ≤ 25% WQBEL
2,4,6-Trichlorophenol	77.3	µg/L	Discharge Conc < TQL
Acenaphthene	138	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	3,623	µg/L	Discharge Conc < TQL
Benzidine	0.005	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.052	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.005	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.052	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	0.52	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS

Bis(2-Chloroethyl)Ether	1.55	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	2,416	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	16.5	µg/L	Discharge Conc ≤ 25% WQBEL
4-Bromophenyl Phenyl Ether	450	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	1.21	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	9,663	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	6.19	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.005	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	1,366	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	84.5	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	1,216	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	2.58	µg/L	Discharge Conc < TQL
Diethyl Phthalate	6,663	µg/L	Discharge Conc ≤ 25% WQBEL
Dimethyl Phthalate	4,165	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	183	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	2.58	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	2.58	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	1.55	µg/L	Discharge Conc < TQL
Fluoranthene	242	µg/L	Discharge Conc < TQL
Fluorene	604	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.004	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.52	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	8.33	µg/L	Discharge Conc < TQL
Hexachloroethane	5.15	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.052	µg/L	Discharge Conc < TQL
Isophorone	411	µg/L	Discharge Conc < TQL
Naphthalene	233	µg/L	Discharge Conc < TQL
Nitrobenzene	121	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.036	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.26	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	170	µg/L	Discharge Conc < TQL
Phenanthrene	8.33	µg/L	Discharge Conc < TQL
Pyrene	242	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	0.85	µg/L	Discharge Conc < TQL

Attachment C:

Outfall 001 TRC Spreadsheet Evaluation

TRC EVALUATION

550	= Q stream (cfs)	0.5	= CV Daily
23.6	= Q discharge (MGD)	0.5	= CV Hourly
4	= no. samples	0.5	= 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 = 2.422	1.3.2.iii	WLA cfc = 2.354
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.902	5.1d	LTA_cfc = 1.368

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)**

Attachment D:

Outfall 001 WQM7.0 Model Run

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19A	37185	MONONGAHELA RIVER	17.530	712.00	5410.00	0.00010	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.100	550.00	0.00	0.000	0.000	0.0	730.00	15.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (ºC)	Disc pH
Irvin Works	PA0004073	23.6000	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.38	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19A	37185	MONONGAHELA RIVER	16.500	711.00	5411.00	0.00010	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.100	550.00	0.00	0.000	0.000	0.0	730.00	15.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (ºC)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19A	37185	MONONGAHELA RIVER	15.500	710.00	5412.00	0.00010	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.100	550.00	0.00	0.000	0.000	0.0	730.00	15.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (ºC)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (ºC)	Analysis pH
Q7-10 Flow												
17.530	550.00	0.00	550.00	36.5092	0.00010	15	730	48.67	0.05	1.175	24.69	7.00
16.500	1100.00	0.00	1100.00	36.5092	0.00010	15	730	48.67	0.10	0.589	24.84	7.00
Q1-10 Flow												
17.530	352.00	0.00	352.00	36.5092	0.00010	NA	NA	NA	0.04	1.774	24.53	7.00
16.500	704.00	0.00	704.00	36.5092	0.00010	NA	NA	NA	0.07	0.904	24.75	7.00
Q30-10 Flow												
17.530	748.00	0.00	748.00	36.5092	0.00010	NA	NA	NA	0.07	0.879	24.77	7.00
16.500	1496.00	0.00	1496.00	36.5092	0.00010	NA	NA	NA	0.14	0.437	24.88	7.00

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
17.530	Irvin Works	11.51	50	11.51	50	0	0
16.500		NA	NA	11.3	NA	NA	NA

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
17.530	Irvin Works	1.39	25	1.39	25	0	0
16.500		NA	NA	1.38	NA	NA	NA

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
17.53	Irvin Works	16.62	16.62	5.29	5.29	5	5	0	0
16.50		NA	NA	NA	NA	NA	NA	NA	NA

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
17.530	23.600	24.689	7.000
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio	Reach Velocity (fps)
730.000	15.000	48.667	0.054
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
2.91	0.218	0.33	1.004
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation	Reach DO Goal (mg/L)
8.170	0.057	O'Connor	6
Reach Travel Time (days)			
1.175			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.118	2.82	0.29	7.58
0.235	2.73	0.26	7.58
0.353	2.65	0.23	7.34
0.470	2.56	0.21	7.10
0.588	2.48	0.18	6.89
0.705	2.40	0.16	6.69
0.823	2.33	0.14	6.51
0.940	2.26	0.13	6.34
1.058	2.19	0.11	6.18
1.175	2.12	0.10	6.04

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
16.500	23.600	24.839	7.000
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio	Reach Velocity (fps)
730.000	15.000	48.667	0.104
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
2.06	0.041	0.05	1.016
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation	Reach DO Goal (mg/L)
7.105	0.080	O'Connor	6
Reach Travel Time (days)			
0.589			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.059	2.05	0.05	7.09
0.118	2.05	0.05	7.07
0.177	2.04	0.04	7.06
0.236	2.04	0.04	7.04
0.294	2.03	0.04	7.03
0.353	2.02	0.04	7.02
0.412	2.02	0.03	7.00
0.471	2.01	0.03	6.99
0.530	2.01	0.03	6.98
0.589	2.00	0.03	6.97

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
17.530	Irvin Works	PA0004073	23.600	CBOD5	16.62		
				NH3-N	5.29	10.58	
				Dissolved Oxygen			5

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19A	37185	MONONGAHELA RIVER	17.530	712.00	5410.00	0.00010	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.100	550.00	0.00	0.000	0.000	0.0	730.00	15.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (ºC)	Disc pH
Irvin Works	PA0004073	23.6000	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	12.80	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19A	37185	MONONGAHELA RIVER	16.500	711.00	5411.00	0.00010	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.100	550.00	0.00	0.000	0.000	0.0	730.00	15.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (ºC)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19A	37185	MONONGAHELA RIVER	15.500	710.00	5412.00	0.00010	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.100	550.00	0.00	0.000	0.000	0.0	730.00	15.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (ºC)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (ºC)	Analysis pH
Q7-10 Flow												
17.530	550.00	0.00	550.00	36.5092	0.00010	15	730	48.67	0.05	1.175	5.93	7.00
16.500	1100.00	0.00	1100.00	36.5092	0.00010	15	730	48.67	0.10	0.589	5.48	7.00
Q1-10 Flow												
17.530	352.00	0.00	352.00	36.5092	0.00010	NA	NA	NA	0.04	1.774	6.41	7.00
16.500	704.00	0.00	704.00	36.5092	0.00010	NA	NA	NA	0.07	0.904	5.74	7.00
Q30-10 Flow												
17.530	748.00	0.00	748.00	36.5092	0.00010	NA	NA	NA	0.07	0.879	5.70	7.00
16.500	1496.00	0.00	1496.00	36.5092	0.00010	NA	NA	NA	0.14	0.437	5.36	7.00

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
17.530	Irvin Works	24.1	50	24.1	50	0	0
16.500		NA	NA	24.1	NA	NA	NA

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
17.530	Irvin Works	4.36	25	4.36	25	0	0
16.500		NA	NA	4.36	NA	NA	NA

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
17.53	Irvin Works	25	25	25	25	5	5	0	0
16.50		NA	NA	NA	NA	NA	NA	NA	NA

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
17.530	23.600	5.934	7.000
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio	Reach Velocity (fps)
730.000	15.000	48.667	0.054
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
3.43	0.519	1.56	0.237
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation	Reach DO Goal (mg/L)
12.314	0.037	O'Connor	6
Reach Travel Time (days)			
1.175			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.118	3.32	1.51	11.18
0.235	3.22	1.47	11.18
0.353	3.12	1.43	11.18
0.470	3.02	1.39	10.96
0.588	2.93	1.35	10.65
0.705	2.83	1.32	10.35
0.823	2.74	1.28	10.06
0.940	2.66	1.25	9.78
1.058	2.57	1.21	9.51
1.175	2.49	1.18	9.25

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
16.500	23.600	5.482	7.000
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio	Reach Velocity (fps)
730.000	15.000	48.667	0.104
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
2.25	0.175	0.61	0.229
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation	Reach DO Goal (mg/L)
8.764	0.051	O'Connor	6
Reach Travel Time (days)			
0.589			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.059	2.24	0.60	8.72
0.118	2.23	0.59	8.68
0.177	2.22	0.58	8.64
0.236	2.21	0.58	8.59
0.294	2.20	0.57	8.55
0.353	2.18	0.56	8.51
0.412	2.17	0.55	8.47
0.471	2.16	0.55	8.43
0.530	2.15	0.54	8.40
0.589	2.14	0.53	8.36

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
17.530	Irvin Works	PA0004073	23.600	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

Attachment E:

Site Temperature Model Spreadsheet Evaluation

Facility: USS Irvin Plant
Permit Number: PA0004073
Stream Name: Monongahela River
Analyst/Engineer: Olesnanik
Stream Q7-10 (cfs): 550

	Facility Flows[1]					Stream Flows	
	Stream (Intake) (MGD)	External (Intake) (MGD)	Consumptive (Loss) (MGD)	Discharge (MGD)		Adj. Q7-10 Stream Flow (cfs)	Downstream[2] Stream Flow (cfs)
Jan 1-31	26.1	0	0.78	25.32		1760.0	1758.8
Feb 1-29	26.1	0	0.78	25.32		1925.0	1923.8
Mar 1-31	26.1	0	0.78	25.32		3850.0	3848.8
Apr 1-15	26.1	0	0.78	25.32		5115.0	5113.8
Apr 16-30	26.1	0	0.78	25.32		5115.0	5113.8
May 1-15	26.1	0	0.78	25.32		2805.0	2803.8
May 16-31	26.1	0	0.78	25.32		2805.0	2803.8
Jun 1-15	26.1	0	0.78	25.32		1650.0	1648.8
Jun 16-30	26.1	0	0.78	25.32		1650.0	1648.8
Jul 1-31	26.1	0	0.78	25.32		935.0	933.8
Aug 1-15	26.1	0	0.78	25.32		770.0	768.8
Aug 16-31	26.1	0	0.78	25.32		770.0	768.8
Sep 1-15	26.1	0	0.78	25.32		605.0	603.8
Sep 16-30	26.1	0	0.78	25.32		605.0	603.8
Oct 1-15	26.1	0	0.78	25.32		660.0	658.8
Oct 16-31	26.1	0	0.78	25.32		660.0	658.8
Nov 1-15	26.1	0	0.78	25.32		880.0	878.8
Nov 16-30	26.1	0	0.78	25.32		880.0	878.8
Dec 1-31	26.1	0	0.78	25.32		1320.0	1318.8

[1] Facility flows are not required (and will not affect the permit limits) if all intake flow is from the receiving stream (Case 1), consumptive losses are small, and permit limits will be expressed as Million BTUs/day.
[2] Downstream Stream Flow includes the discharge flow.

Please forward all comments to Tom Starosta at 717-787-4317, tstarosta@state.pa.us.

Version 1.0 -- 08/01/2004 Reference: Implementation Guidance for Temperature Criteria, DEP-ID: 391-2000-017

NOTE: The user can only edit fields that are blue.

NOTE: MGD x 1.547 = cfs.

Facility:	**USS Irvin Plant**							
Permit Number:	PA0004073							
Stream:	Monongahela River							
	WWF Criteria	**CWF Criteria**	**TSF Criteria**	**316 Criteria**		**Q7-10 Multipliers**	**Q7-10 Multipliers**
	(ºF)	(ºF)	(ºF)	(ºF)		(Used in Analysis)	(Default - Info Only)
Jan 1-31	40	38	40	0		3.2	3.2
Feb 1-29	40	38	40	0		3.5	3.5
Mar 1-31	46	42	46	0		7	7
Apr 1-15	52	48	52	0		9.3	9.3
Apr 16-30	58	52	58	0		9.3	9.3
May 1-15	64	54	64	0		5.1	5.1
May 16-30	72	58	68	0		5.1	5.1
Jun 1-15	80	60	70	0		3	3
Jun 16-30	84	64	72	0		3	3
Jul 1-31	87	66	74	0		1.7	1.7
Aug 1-15	87	66	80	0		1.4	1.4
Aug 16-31	87	66	87	0		1.4	1.4
Sep 1-15	84	64	84	0		1.1	1.1
Sep 16-30	78	60	78	0		1.1	1.1
Oct 1-15	72	54	72	0		1.2	1.2
Oct 16-31	66	50	66	0		1.2	1.2
Nov 1-15	58	46	58	0		1.6	1.6
Nov 16-30	50	42	50	0		1.6	1.6
Dec 1-31	42	40	42	0		2.4	2.4

NOTES:
WWF= Warm water fishes
CWF= Cold water fishes
TSF= Trout stocking

Facility: **USS Irvin Plant**
Permit Number: PA0004073
Stream: Monongahela River

	WWF Ambient Stream Temperature (ºF) (Default)	Ambient Stream Temperature (ºF) (Site-specific data)	Target Maximum Stream Temp.[1] (ºF)	**WWF** Daily WLA[2] (Million BTUs/day)		**WWF** Daily WLA[3] (ºF)	at Discharge Flow (MGD)
Jan 1-31	35	0	40	47,399		110.0	25.32
Feb 1-29	35	0	40	51,846		110.0	25.32
Mar 1-31	40	0	46	124,470		110.0	25.32
Apr 1-15	47	0	52	137,817		110.0	25.32
Apr 16-30	53	0	58	137,817		110.0	25.32
May 1-15	58	0	64	90,675		110.0	25.32
May 16-30	62	0	72	151,124		110.0	25.32
Jun 1-15	67	0	80	115,531		110.0	25.32
Jun 16-30	71	0	84	115,531		110.0	25.32
Jul 1-31	75	0	87	60,398		110.0	25.32
Aug 1-15	74	0	87	53,869		110.0	25.32
Aug 16-31	74	0	87	53,869		110.0	25.32
Sep 1-15	71	0	84	42,308		110.0	25.32
Sep 16-30	65	0	78	42,308		110.0	25.32
Oct 1-15	60	0	72	42,611		110.0	25.32
Oct 16-31	54	0	66	42,611		110.0	25.32
Nov 1-15	48	0	58	47,367		110.0	25.32
Nov 16-30	42	0	50	37,894		110.0	25.32
Dec 1-31	37	0	42	35,541		110.0	25.32

[1] This is the maximum of the WWF WQ criterion or the ambient temperature. The ambient temperature may be either the design (median) temperature for WWF, or the ambient stream temperature based on site-specific data entered by the user. A minimum of 1ºF above ambient stream temperature is allocated.

[2] The WLA expressed in Million BTUs/day is valid for Case 1 scenarios, and disabled for Case 2 scenarios.

[3] The WLA expressed in ºF is valid only if the limit is tied to a daily discharge flow limit (may be used for Case 1 or Case 2). WLAs greater than 110ºF are displayed as 110ºF.

Attachment F:

Effluent Limitation Guidelines Calculations

United States Steel Corporation - Mon Valley Irvin Plant
Federal ELG Calculations
PA0004073
Authorization 827245

NPDES Permit Application Reported Production Rates	
Operation	Max Monthly Average Tons/Day
64" Pickle Line	3316
84" Pickle Line	5170
Cont. Anneal Line	779
No. 3 5 Stand Mill	8068
N0. 1 Galvanize Line	605
No. 2 Galvanize Line	572
No. 7 Temper Mill	3741
80" Hot Strip Mill	9994

IMP 201

64-Inch Continuous Pickle Production Line

ELG 40 CFR 420.94 (b)(2) NSPS Iron and Steel Manufacturing Hydrochloric Acid Pickling -Strip, sheet, and plate - Continuous

Pollutant	ELG - BPT Effluent Limitations (lbs/1,000 lb product)		Mass-Based Effluent Limits (lbs./day)	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	0.0117	0.00501	33.226	77.594
O&G*	0.00501	0.00167	11.075	33.226
Lead	0.0000751	0.000025	0.166	0.498
Zinc	0.00010	0.0000334	0.222	0.663
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

Sample Calculations

Mass-Based Effluent Limit (lbs/day) = [ELG Max for any 1 day (lbs/1,000 lbs production)] * [Daily Max Production (1,000 lbs production)]
TSS Max Daily (lbs/day) = (0.0117 lbs/1,000 lbs production) * [((3316 tons production/day) * (2,000 lbs/ton)) / (1,000 lbs production)]
TSS Max Daily (lbs/day) = 838.989 lbs/day

* the limitations for oil and grease shall be applicable when acid picking wastewaters are treated with cold rolling wastewaters

ELG 40 CFR 420.94(b)(4) Iron and Steel Manufacturing Combination Acid Pickling -Fume Scrubbers (NSPS)

(1 scrubbers)

Pollutant	ELG - BPT Effluent Limitations		Mass-Based Effluent Limits	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	5.720	2.45	5.401	12.610
O&G*	2.45	0.819	1.806	5.401
Lead	0.0368	0.0123	0.027	0.081
Zinc	0.04910	0.0164	0.036	0.108
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

* the limitations for oil and grease shall be applicable when acid picking wastewaters are treated with cold rolling wastewaters

Sample Calculations

Mass-Based Effluent Limit (lbs/day) = [ELG Max for any 1 day (Kg/Day] * (mass unit conversion)*number of scrubbers

TSS Max Daily (lbs/day) = (5.720 kg/day) * (2.2046 lbs/Kg) * (1 Scrubbers)

TSS Max Daily (lbs/day) = 12.61 lbs/day

84-Inch Continuous Pickle Production Line

ELG 40 CFR 420.92 (b)(2) BAT Iron and Steel Manufacturing Hydrochloric Acid Pickling -Strip, sheet, and plate -

Pollutant	ELG - BPT Effluent Limitations		Mass-Based Effluent Limits	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	0.0818	0.035	361.900	845.812
O&G*	0.035	0.0117	120.978	361.900
Lead	0.000526	0.000175	1.810	5.439
Zinc	0.000701	0.000234	2.420	7.248
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

* the limitations for oil and grease shall be applicable when acid picking wastewaters are treated with cold rolling wastewaters

ELG 40 CFR 420.92(b)(4) Iron and Steel Manufacturing Combination Acid Pickling -Fume Scrubbers (BAT)

(1 scrubbers)

Pollutant	ELG - BPT Effluent Limitations		Mass-Based Effluent Limits	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	5.720	2.45	5.401	12.610
O&G*	2.45	0.819	1.806	5.401
Lead	0.0368	0.0123	0.027	0.081
Zinc	0.04910	0.0164	0.036	0.108
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

* the limitations for oil and grease shall be applicable when acid picking wastewaters are treated

Continuous Annealing Line (Alkaline Cleaning of Strip)

ELG 40 CFR 420.112 b) BPT Iron and Steel Manufacturing Alkaline Cleaning - Continuous

Pollutant	ELG - BPT Effluent Limitations		Mass-Based Effluent Limits	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	0.102	0.0438	68.240	158.916
O&G	0.0438	0.0146	22.747	68.240
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

Cold Reduction Mill (Cold Rolling of Steel in a five-stand Recirculating Mill

ELG 40 CFR 420.102 a)(2) BPT Iron and Steel Manufacturing Cold Forming Cold Rolling Mill Recirculation - Multiple

Pollutant	ELG - BPT Effluent Limitations		Mass-Based Effluent Limits	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	0.00626	0.00313	50.506	101.011
O&G	0.00261	0.00104	16.781	42.115
Chromium*	0.000104	0.0000418	0.674	1.678
Lead	0.0000469	0.0000156	0.252	0.757
Nickel*	0.0000939	0.0000313	0.505	1.515
Zinc	0.0000313	0.0000104	0.168	0.505
Naphthalene	0.0000104			0.168
Tetrachloroethylene	0.0000156			0.252
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

*The limitations for Chromium and Nickel Shall be appliavle in lieu of those lead and zinc when cold rolling wastewaters are treated with descaling or combination acid pickling wastewaters.

No.1 Galvanize Line (Hot Coating of Steel Strip)

ELG 40 CFR 420.122 a)(1) BPT Iron and Steel Manufacturing Hot Coating Galvanizing, terne coating, and other coatings - Strip, Sheet, and miscellaneous products

Pollutant	ELG - BPT Effluent Limitations		Mass-Based Effluent Limits	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	0.175	0.0751	90.871	211.750
O&G	0.0751	0.025	30.250	90.871
Lead	0.00113	0.000376	0.455	1.367
Zinc	0.00150	0.0005	0.605	1.815
Chromium (hexavalent)*	0.00015	0.0000501	0.061	0.182
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

*The limitations for hexavalent chromium shall apply only to galvanizing operations which discharge wastewaters from the chromate rinse step

No.2 Galvanize Line (Alkaline Cleaning of Steel Stip, Hot Coating of Steel Strip and One Fume Scrubber)

ELG 40 CFR 420.112 (b) BPT Iron and Steel Manufacturing Alkaline Cleaning - Continuous

Pollutant	ELG - BPT Effluent Limitations		Mass-Based Effluent Limits	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	0.102	0.0438	50.107	116.688
O&G	0.0438	0.0146	16.702	50.107
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

ELG 40 CFR 420.122 (a)(1) BPT Iron and Steel Manufacturing Hot Coating Galvanizing, terne coating, and other coatings - Strip, Sheet, and miscellaneous products

Pollutant	ELG - BPT Effluent Limitations		Mass-Based Effluent Limits	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	0.175	0.0751	85.914	200.200
O&G	0.0751	0.025	28.600	85.914
Lead	0.00113	0.000376	0.430	1.293
Zinc	0.00150	0.0005	0.572	1.716
Chromium (hexavalent)*	0.00015	0.0000501	0.057	0.172
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

*The limitations for hexavalent chromium shall apply only to galvanizing operations which discharge wastewaters from the chromate rinse step

ELG 40 CFR 420.122/123 (c) BPT/BAT Iron and Steel Manufacturing Hot Coating Galvanizing, terne coating, and other coatings - Fume Scrubber

(1 scrubbers)

Pollutant	ELG - BPT Effluent Limitations		Mass-Based Effluent Limits	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	38.100	16.3	35.935	83.995
O&G	16.3	5.45	12.015	35.935
Lead	0.0368	0.0123	0.027	0.081
Zinc	0.04910	0.0164	0.036	0.108
Chromium (Hexavalent)*	0.0049	0.00163	0.004	0.011
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

*The limitations for hexavalent chromium shall apply only to galvanizing operations which discharge wastewaters from the chromate rinse step

Temper Mill (Cold Rolling of Steel in Single-stand Direct Application Mill)

ELG 40 CFR 420.102 (a)(4) BPT Iron and Steel Manufacturing Cold Forming Cold Rolling Mill Direct Application - Single Stand

Pollutant	ELG - BPT Effluent Limitations		Mass-Based Effluent Limits	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	0.0225	0.0113	84.547	168.345
O&G	0.00939	0.00376	28.132	70.256
Chromium*	0.0003760	0.00015	1.122	2.813
Lead	0.0001690	0.0000563	0.421	1.264
Nickel*	0.0003380	0.000113	0.845	2.529
Zinc	0.0001130	0.0000376	0.281	0.845
Naphthalene	0.0000376			0.281
Tetrachloroethylene	0.0000563			0.421
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

*The limitations for Chromium and Nickel Shall be appliavle in lieu of those lead and zinc when cold rolling wastewaters are treated with descaling or combination acid pickling wastewaters.

Pollutant	Mass-Based Effluent Limits	
	Average Monthly	Max Daily
TSS	872.049	1989.533
O&G	290.893	849.368
~~Chromium*~~	~~1.797~~	~~4.491~~
~~Chromium (Hexavalent)**~~	~~0.122~~	~~0.364~~
Lead	3.615	10.862
~~Nickel*~~	~~1.351~~	~~4.044~~
Zinc	4.376	13.118
Naphthalene		0.449
Tetrachloroethylene		0.673
pH	Within Range of 6.0 to 9.0	

*Chromium and Nickel limitations will not be imposed because cold rolling wastewaters are not treated with descaling or combination acid pickling wastewaters.

**Hexavalent Chromium limitations will not be imposed because the glvanizing operations do not discharge wastewater from the chromate rinse step.

IMP 301

Hot Strip Mill (Carbon Plate Mill Hot Forming Operations)

ELG 40 CFR 420.72 (c)(1) BPT Iron and Steel Manufacturing Hot Forming Flat Mills - Hot Strip and Sheet Mills, Carbon and Specialty

Pollutant	ELG - BPT Effluent Limitations (lbs/1,000 lb product)		Mass-Based Effluent Limits (lbs./day)	
	Max for any 1 day	Average Daily Value for 30 consecutive days	Average Monthly	Max Daily
TSS	0.427	0.16	3198.080	8534.876
O&G	0.107			2138.716
pH	Within Range of 6.0 to 9.0		Within Range of 6.0 to 9.0	

Attachment G:

Outfall 003 Toxics Management Spreadsheet Evaluation

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **USS Mon Valley Irvin Plant** NPDES Permit No.: **PA0004073** Outfall No.: **003**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **NCCW, Boiler Blowdown**

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
1.72	761	7.66						

					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		1280									
	Chloride (PWS)	mg/L		116									
	Bromide	mg/L		1									
	Sulfate (PWS)	mg/L		591									
	Fluoride (PWS)	mg/L		0.24									
Group 2	Total Aluminum	µg/L		220									
	Total Antimony	µg/L		0.53									
	Total Arsenic	µg/L	<	1									
	Total Barium	µg/L		21.5									
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L		103									
	Total Cadmium	µg/L	<	0.16									
	Total Chromium (III)	µg/L		0.44									
	Hexavalent Chromium	µg/L		0.051									
	Total Cobalt	µg/L		0.458									
	Total Copper	µg/L		1.66									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	10									
	Dissolved Iron	µg/L	<	20									
	Total Iron	µg/L		2360									
	Total Lead	µg/L		0.33									
	Total Manganese	µg/L		230									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		7.5									
	Total Phenols (Phenolics) (PWS)	µg/L	<	2									
	Total Selenium	µg/L	<	2									
	Total Silver	µg/L	<	0.144									
	Total Thallium	µg/L	<	0.176									
	Total Zinc	µg/L		11									
	Total Molybdenum	µg/L		1.5									
	Acrolein	µg/L	<	1.3									
	Acrylamide	µg/L	<	0.011									
	Acrylonitrile	µg/L	<	2									
	Benzene	µg/L	<	0.12									
	Bromoform	µg/L	<	0.37									

Group 3	Carbon Tetrachloride	µg/L	<	0.23									
	Chlorobenzene	µg/L	<	0.25									
	Chlorodibromomethane	µg/L	<	0.25									
	Chloroethane	µg/L	<	0.27									
	2-Chloroethyl Vinyl Ether	µg/L	<	3.1									
	Chloroform	µg/L	<	0.15									
	Dichlorobromomethane	µg/L	<	0.18									
	1,1-Dichloroethane	µg/L	<	0.05									
	1,2-Dichloroethane	µg/L	<	0.12									
	1,1-Dichloroethylene	µg/L	<	0.13									
	1,2-Dichloropropane	µg/L	<	0.26									
	1,3-Dichloropropylene	µg/L	<	0.47									
	1,4-Dioxane	µg/L		0.2									
	Ethylbenzene	µg/L	<	0.2									
	Methyl Bromide	µg/L	<	0.42									
	Methyl Chloride	µg/L	<	0.33									
	Methylene Chloride	µg/L	<	0.14									
	1,1,2,2-Tetrachloroethane	µg/L	<	0.38									
	Tetrachloroethylene	µg/L	<	0.27									
	Toluene	µg/L	<	0.24									
	1,2-trans-Dichloroethylene	µg/L	<	0.08									
	1,1,1-Trichloroethane	µg/L	<	0.12									
	1,1,2-Trichloroethane	µg/L	<	0.13									
	Trichloroethylene	µg/L	<	0.29									
	Vinyl Chloride	µg/L	<	0.33									
Group 4	2-Chlorophenol	µg/L	<	0.38									
	2,4-Dichlorophenol	µg/L	<	0.43									
	2,4-Dimethylphenol	µg/L	<	0.46									
	4,6-Dinitro-o-Cresol	µg/L	<	1.2									
	2,4-Dinitrophenol	µg/L	<	2.8									
	2-Nitrophenol	µg/L	<	0.38									
	4-Nitrophenol	µg/L	<	1.3									
	p-Chloro-m-Cresol	µg/L	<	0.38									
	Pentachlorophenol	µg/L	<	1.7									
	Phenol	µg/L	<	0.25									
	2,4,6-Trichlorophenol	µg/L	<	0.46									
Group 5	Acenaphthene	µg/L	<	0.39									
	Acenaphthylene	µg/L	<	0.38									
	Anthracene	µg/L	<	0.39									
	Benzidine	µg/L	<	2.5									
	Benzo(a)Anthracene	µg/L	<	0.4									
	Benzo(a)Pyrene	µg/L	<	0.35									
	3,4-Benzofluoranthene	µg/L	<	0.39									
	Benzo(ghi)Perylene	µg/L	<	0.41									
	Benzo(k)Fluoranthene	µg/L	<	0.38									
	Bis(2-Chloroethoxy)Methane	µg/L	<	0.43									
	Bis(2-Chloroethyl)Ether	µg/L	<	0.37									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	0.43									
	Bis(2-Ethylhexyl)Phthalate	µg/L		3.1									
	4-Bromophenyl Phenyl Ether	µg/L	<	0.44									
	Butyl Benzyl Phthalate	µg/L		4.3									
	2-Chloronaphthalene	µg/L	<	0.39									
	4-Chlorophenyl Phenyl Ether	µg/L	<	0.39									
	Chrysene	µg/L	<	0.41									
	Dibenzo(a,h)Anthrancene	µg/L	<	0.42									
	1,2-Dichlorobenzene	µg/L	<	0.37									
	1,3-Dichlorobenzene	µg/L	<	0.43									
	1,4-Dichlorobenzene	µg/L	<	0.43									
	3,3-Dichlorobenzidine	µg/L	<	0.97									
	Diethyl Phthalate	µg/L		1.4									
	Dimethyl Phthalate	µg/L	<	0.46									
	Di-n-Butyl Phthalate	µg/L		3.2									
	2,4-Dinitrotoluene	µg/L	<	0.44									

2,6-Dinitrotoluene	µg/L	<	0.4									
Di-n-Octyl Phthalate	µg/L	<	0.86									
1,2-Diphenylhydrazine	µg/L	<	0.37									
Fluoranthene	µg/L	<	0.42									
Fluorene	µg/L	<	0.37									
Hexachlorobenzene	µg/L	<	0.42									
Hexachlorobutadiene	µg/L	<	0.48									
Hexachlorocyclopentadiene	µg/L	<	0.72									
Hexachloroethane	µg/L	<	0.36									
Indeno(1,2,3-cd)Pyrene	µg/L	<	0.39									
Isophorone	µg/L	<	0.42									
Naphthalene	µg/L	<	0.39									
Nitrobenzene	µg/L	<	0.51									
n-Nitrosodimethylamine	µg/L	<	0.97									
n-Nitrosodi-n-Propylamine	µg/L	<	0.41									
n-Nitrosodiphenylamine	µg/L	<	0.48									
Phenanthrene	µg/L	<	0.38									
Pyrene	µg/L	<	0.41									
1,2,4-Trichlorobenzene	µg/L	<	0.41									

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

USS Mon Valley Irvin Plant, NPDES Permit No. PA0004073, Outfall 003

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 (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	037185	17.53	712	5410			Yes
End of Reach 1	037185	16	710	5411			Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi^2)*	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	17.53	0.1	550			850	12					100	7		
End of Reach 1	16	0.1	550			850	12								

Q_h

Location	RMI	LFY (cfs/mi^2)	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	17.53														
End of Reach 1	16														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

USS Mon Valley Irvin Plant, NPDES Permit No. PA0004073, Outfall 003

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.100 Analysis Hardness (mg/l): 130.5 Analysis pH: 7.02

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	16,255	
Total Antimony	0	0		0	1,100	1,100	23,841	
Total Arsenic	0	0		0	340	340	7,369	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	455,144	
Total Boron	0	0		0	8,100	8,100	175,556	
Total Cadmium	0	0		0	2.608	2.8	60.6	Chem Translator of 0.933 applied
Total Chromium (III)	0	0		0	708.556	2,242	48,598	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	353	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	2,059	
Total Copper	0	0		0	17.270	18.0	390	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	86.186	115	2,483	Chem Translator of 0.752 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	35.7	Chem Translator of 0.85 applied
Total Nickel	0	0		0	586.497	588	12,737	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	5.085	5.98	130	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	1,409	
Total Zinc	0	0		0	146.827	150	3,254	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	65.0	

Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	650	650	14,088	
Benzene	0	0		0	640	640	13,871	
Bromoform	0	0		0	1,800	1,800	39,012	
Carbon Tetrachloride	0	0		0	2,800	2,800	60,686	
Chlorobenzene	0	0		0	1,200	1,200	26,008	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	390,124	
Chloroform	0	0		0	1,900	1,900	41,180	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	325,103	
1,1-Dichloroethylene	0	0		0	7,500	7,500	162,552	
1,2-Dichloropropane	0	0		0	11,000	11,000	238,409	
1,3-Dichloropropylene	0	0		0	310	310	6,719	
Ethylbenzene	0	0		0	2,900	2,900	62,853	
Methyl Bromide	0	0		0	550	550	11,920	
Methyl Chloride	0	0		0	28,000	28,000	606,859	
Methylene Chloride	0	0		0	12,000	12,000	260,083	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	21,674	
Tetrachloroethylene	0	0		0	700	700	15,171	
Toluene	0	0		0	1,700	1,700	36,845	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	147,380	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	65,021	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	73,690	
Trichloroethylene	0	0		0	2,300	2,300	49,849	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	12,137	
2,4-Dichlorophenol	0	0		0	1,700	1,700	36,845	
2,4-Dimethylphenol	0	0		0	660	660	14,305	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	1,734	
2,4-Dinitrophenol	0	0		0	660	660	14,305	
2-Nitrophenol	0	0		0	8,000	8,000	173,388	
4-Nitrophenol	0	0		0	2,300	2,300	49,849	
p-Chloro-m-Cresol	0	0		0	160	160	3,468	
Pentachlorophenol	0	0		0	8.864	8.86	192	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	9,970	
Acenaphthene	0	0		0	83	83.0	1,799	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	6,502	
Benzo(a)Anthracene	0	0		0	0.5	0.5	10.8	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	650,206	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	97,531	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	5,852	

Butyl Benzyl Phthalate	0	0		0	140	140	3,034	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	17,772	
1,3-Dichlorobenzene	0	0		0	350	350	7,586	
1,4-Dichlorobenzene	0	0		0	730	730	15,822	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	86,694	
Dimethyl Phthalate	0	0		0	2,500	2,500	54,184	
Di-n-Butyl Phthalate	0	0		0	110	110	2,384	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	34,678	
2,6-Dinitrotoluene	0	0		0	990	990	21,457	
1,2-Diphenylhydrazine	0	0		0	15	15.0	325	
Fluoranthene	0	0		0	200	200	4,335	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	217	
Hexachlorocyclopentadiene	0	0		0	5	5.0	108	
Hexachloroethane	0	0		0	60	60.0	1,300	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	216,735	
Naphthalene	0	0		0	140	140	3,034	
Nitrobenzene	0	0		0	4,000	4,000	86,694	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	368,450	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	6,502	
Phenanthrene	0	0		0	5	5.0	108	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	2,818	

☑ *CFC* CCT (min): 720 PMF: 0.693 Analysis Hardness (mg/l): 104.58 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	31,731	
Total Arsenic	0	0		0	150	150	21,635	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	591,345	
Total Boron	0	0		0	1,600	1,600	230,769	
Total Cadmium	0	0		0	0.254	0.28	40.3	Chem Translator of 0.907 applied
Total Chromium (III)	0	0		0	76.885	89.4	12,894	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	1,499	Chem Translator of 0.962 applied

Total Cobalt	0	0		0	19	19.0	2,740	
Total Copper	0	0		0	9.305	9.69	1,398	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	311,552	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.642	3.37	486	Chem Translator of 0.784 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	131	Chem Translator of 0.85 applied
Total Nickel	0	0		0	54.016	54.2	7,814	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	720	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	1,875	
Total Zinc	0	0		0	122.711	124	17,950	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	433	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	130	130	18,750	
Benzene	0	0		0	130	130	18,750	
Bromoform	0	0		0	370	370	53,365	
Carbon Tetrachloride	0	0		0	560	560	80,769	
Chlorobenzene	0	0		0	240	240	34,615	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	504,807	
Chloroform	0	0		0	390	390	56,250	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	447,115	
1,1-Dichloroethylene	0	0		0	1,500	1,500	216,346	
1,2-Dichloropropane	0	0		0	2,200	2,200	317,307	
1,3-Dichloropropylene	0	0		0	61	61.0	8,798	
Ethylbenzene	0	0		0	580	580	83,654	
Methyl Bromide	0	0		0	110	110	15,865	
Methyl Chloride	0	0		0	5,500	5,500	793,268	
Methylene Chloride	0	0		0	2,400	2,400	346,153	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	30,288	
Tetrachloroethylene	0	0		0	140	140	20,192	
Toluene	0	0		0	330	330	47,596	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	201,923	
1,1,1-Trichloroethane	0	0		0	610	610	87,981	
1,1,2-Trichloroethane	0	0		0	680	680	98,077	
Trichloroethylene	0	0		0	450	450	64,904	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	15,865	
2,4-Dichlorophenol	0	0		0	340	340	49,038	
2,4-Dimethylphenol	0	0		0	130	130	18,750	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	2,308	
2,4-Dinitrophenol	0	0		0	130	130	18,750	

2-Nitrophenol	0	0		0	1,600	1,600	230,769	
4-Nitrophenol	0	0		0	470	470	67,788	
p-Chloro-m-Cresol	0	0		0	500	500	72,115	
Pentachlorophenol	0	0		0	6.801	6.8	981	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	13,125	
Acenaphthene	0	0		0	17	17.0	2,452	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	8,510	
Benzo(a)Anthracene	0	0		0	0.1	0.1	14.4	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	865,383	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	131,250	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	7,788	
Butyl Benzyl Phthalate	0	0		0	35	35.0	5,048	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	23,077	
1,3-Dichlorobenzene	0	0		0	69	69.0	9,952	
1,4-Dichlorobenzene	0	0		0	150	150	21,635	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	115,384	
Dimethyl Phthalate	0	0		0	500	500	72,115	
Di-n-Butyl Phthalate	0	0		0	21	21.0	3,029	
2,4-Dinitrotoluene	0	0		0	320	320	46,154	
2,6-Dinitrotoluene	0	0		0	200	200	28,846	
1,2-Diphenylhydrazine	0	0		0	3	3.0	433	
Fluoranthene	0	0		0	40	40.0	5,769	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	288	
Hexachlorocyclopentadiene	0	0		0	1	1.0	144	
Hexachloroethane	0	0		0	12	12.0	1,731	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	302,884	
Naphthalene	0	0		0	43	43.0	6,202	
Nitrobenzene	0	0		0	810	810	116,827	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	490,384	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	8,510	
Phenanthrene	0	0		0	1	1.0	144	

Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	3,750	

☑ ***THH*** CCT (min): 720 PMF: 0.693 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	808	
Total Arsenic	0	0		0	10	10.0	1,442	
Total Barium	0	0		0	2,400	2,400	346,153	
Total Boron	0	0		0	3,100	3,100	447,115	
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	43,269	
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	144,231	
Total Mercury	0	0		0	0.050	0.05	7.21	
Total Nickel	0	0		0	610	610	87,981	
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	34.6	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	433	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	14,423	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	822	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	4,760	

1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	9,808	
Methyl Bromide	0	0		0	100	100.0	14,423	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	8,221	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	14,423	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	1,442,305	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	4,327	
2,4-Dichlorophenol	0	0		0	10	10.0	1,442	
2,4-Dimethylphenol	0	0		0	100	100.0	14,423	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	288	
2,4-Dinitrophenol	0	0		0	10	10.0	1,442	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	576,922	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	10,096	
Anthracene	0	0		0	300	300	43,269	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	28,846	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	14.4	
2-Chloronaphthalene	0	0		0	800	800	115,384	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	144,231	
1,3-Dichlorobenzene	0	0		0	7	7.0	1,010	
1,4-Dichlorobenzene	0	0		0	300	300	43,269	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	86,538	

Dimethyl Phthalate	0	0		0	2,000	2,000	288,461	
Di-n-Butyl Phthalate	0	0		0	20	20.0	2,885	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	2,885	
Fluorene	0	0		0	50	50.0	7,212	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	577	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	4,904	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	1,442	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	2,885	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	10.1	

☑ *CRL* CCT (min): ###### 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	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylamide	0	0		0	0.07	0.07	48.6	
Acrylonitrile	0	0		0	0.06	0.06	41.7	
Benzene	0	0		0	0.58	0.58	403	
Bromoform	0	0		0	7	7.0	4,862	
Carbon Tetrachloride	0	0		0	0.4	0.4	278	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	556	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.95	0.95	660	
1,2-Dichloroethane	0	0		0	9.9	9.9	6,876	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	625	
1,3-Dichloropropylene	0	0		0	0.27	0.27	188	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methyl Bromide	0	0		0	N/A	N/A	N/A	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	20	20.0	13,890	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	139	
Tetrachloroethylene	0	0		0	10	10.0	6,945	
Toluene	0	0		0	N/A	N/A	N/A	
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	382	
Trichloroethylene	0	0		0	0.6	0.6	417	
Vinyl Chloride	0	0		0	0.02	0.02	13.9	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A	
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	20.8	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	1,042	
Acenaphthene	0	0		0	N/A	N/A	N/A	

Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.0001	0.0001	0.069	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.69	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.069	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.69	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	6.95	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	20.8	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	222	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.12	0.12	83.3	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.069	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	34.7	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	34.7	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	34.7	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	20.8	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.056	
Hexachlorobutadiene	0	0		0	0.01	0.01	6.95	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	69.5	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.69	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.49	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	3.47	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	2,292	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	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
Butyl Benzyl Phthalate	Report	Report	Report	Report	Report	µg/L	14.4	THH	Discharge Conc > 25% WQBEL (no 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
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	10,419	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	808	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	291,729	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	112,524	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	38.8	µg/L	Discharge Conc < TQL
Total Chromium (III)	12,894	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	226	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	1,320	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	250	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	43,269	µg/L	Discharge Conc < TQL
Total Iron	311,552	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	486	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	144,231	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	7.21	µg/L	Discharge Conc < TQL
Total Nickel	7,814	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	720	µg/L	Discharge Conc < TQL
Total Silver	83.1	µg/L	Discharge Conc < TQL
Total Thallium	34.6	µg/L	Discharge Conc < TQL
Total Zinc	2,086	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	41.7	µg/L	Discharge Conc < TQL

Acrylamide	48.6	µg/L	Discharge Conc < TQL
Acrylonitrile	41.7	µg/L	Discharge Conc < TQL
Benzene	403	µg/L	Discharge Conc < TQL
Bromoform	4,862	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	278	µg/L	Discharge Conc < TQL
Chlorobenzene	14,423	µg/L	Discharge Conc < TQL
Chlorodibromomethane	556	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	250,054	µg/L	Discharge Conc < TQL
Chloroform	822	µg/L	Discharge Conc < TQL
Dichlorobromomethane	660	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	6,876	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	4,760	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	625	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	188	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	9,808	µg/L	Discharge Conc < TQL
Methyl Bromide	7,641	µg/L	Discharge Conc < TQL
Methyl Chloride	388,972	µg/L	Discharge Conc < TQL
Methylene Chloride	13,890	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	139	µg/L	Discharge Conc < TQL
Tetrachloroethylene	6,945	µg/L	Discharge Conc < TQL
Toluene	8,221	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	14,423	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	41,676	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	382	µg/L	Discharge Conc < TQL
Trichloroethylene	417	µg/L	Discharge Conc < TQL
Vinyl Chloride	13.9	µg/L	Discharge Conc < TQL
2-Chlorophenol	4,327	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	1,442	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	9,169	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	288	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	1,442	µg/L	Discharge Conc < TQL
2-Nitrophenol	111,135	µg/L	Discharge Conc < TQL
4-Nitrophenol	31,951	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	2,223	µg/L	Discharge Conc < TQL
Pentachlorophenol	20.8	µg/L	Discharge Conc < TQL
Phenol	576,922	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	1,042	µg/L	Discharge Conc < TQL
Acenaphthene	1,153	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	43,269	µg/L	Discharge Conc < TQL
Benzidine	0.069	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.69	µg/L	Discharge Conc < TQL

Benzo(a)Pyrene	0.069	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.69	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	6.95	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	20.8	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	28,846	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	222	µg/L	Discharge Conc ≤ 25% WQBEL
4-Bromophenyl Phenyl Ether	3,751	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	115,384	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	83.3	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.069	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	11,391	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	1,010	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	10,141	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	34.7	µg/L	Discharge Conc < TQL
Diethyl Phthalate	55,567	µg/L	Discharge Conc ≤ 25% WQBEL
Dimethyl Phthalate	34,730	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	1,528	µg/L	Discharge Conc ≤ 25% WQBEL
2,4-Dinitrotoluene	34.7	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	34.7	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	20.8	µg/L	Discharge Conc < TQL
Fluoranthene	2,778	µg/L	Discharge Conc < TQL
Fluorene	7,212	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.056	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	6.95	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	69.5	µg/L	Discharge Conc < TQL
Hexachloroethane	69.5	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.69	µg/L	Discharge Conc < TQL
Isophorone	4,904	µg/L	Discharge Conc < TQL
Naphthalene	1,945	µg/L	Discharge Conc < TQL
Nitrobenzene	1,442	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.49	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	3.47	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	2,292	µg/L	Discharge Conc < TQL
Phenanthrene	69.5	µg/L	Discharge Conc < TQL
Pyrene	2,885	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	10.1	µg/L	Discharge Conc < TQL

Attachment H:

Outfall 003 TRC Spreadsheet Evaluation

TRC EVALUATION

550	= Q stream (cfs)	0.5	= CV Daily
1.72	= Q discharge (MGD)	0.5	= CV Hourly
4	= no. samples	0.5	= 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)

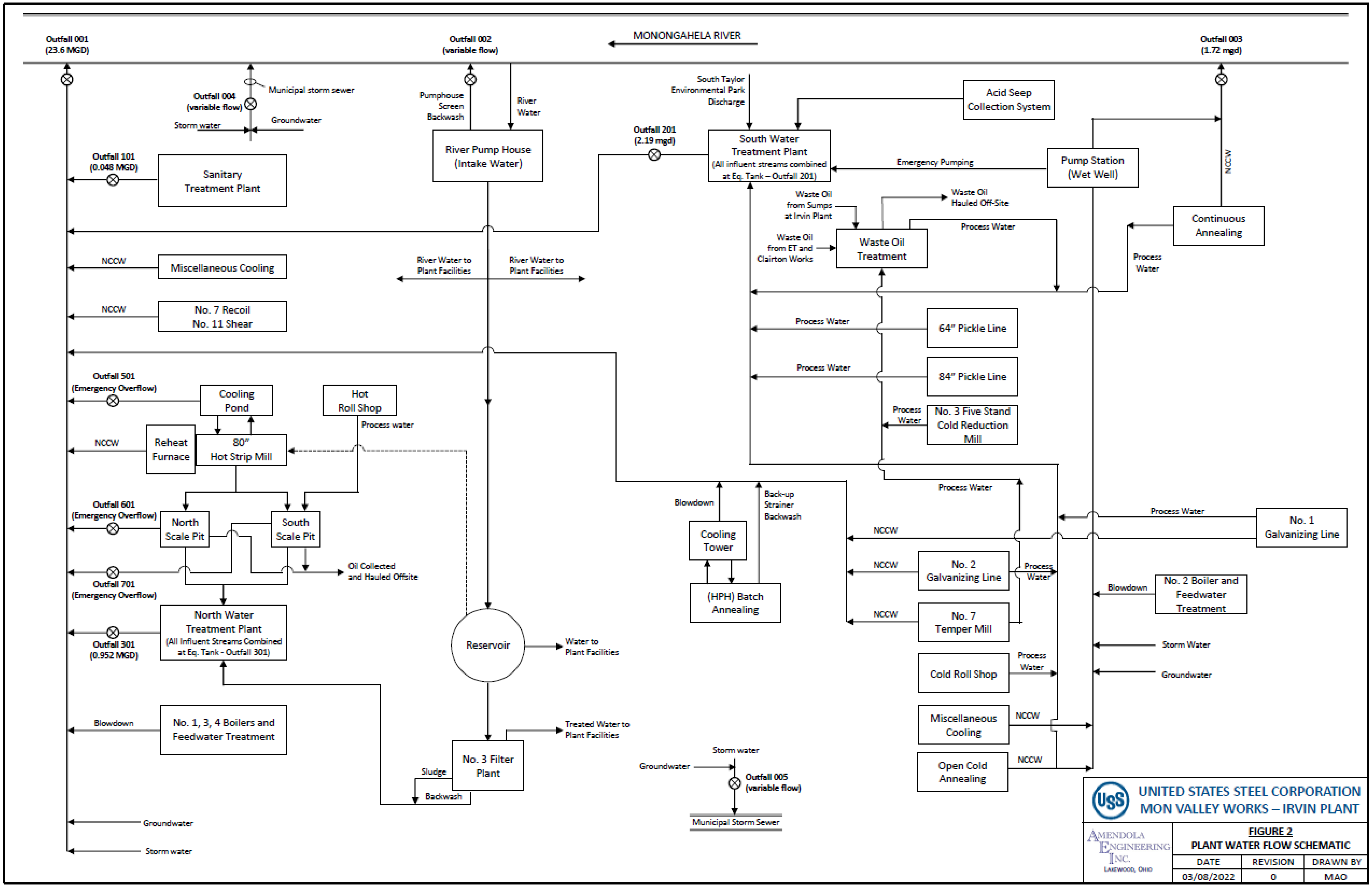
Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 32.988	1.3.2.iii	WLA cfc = 32.153
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 12.292	5.1d	LTA_cfc = 18.692

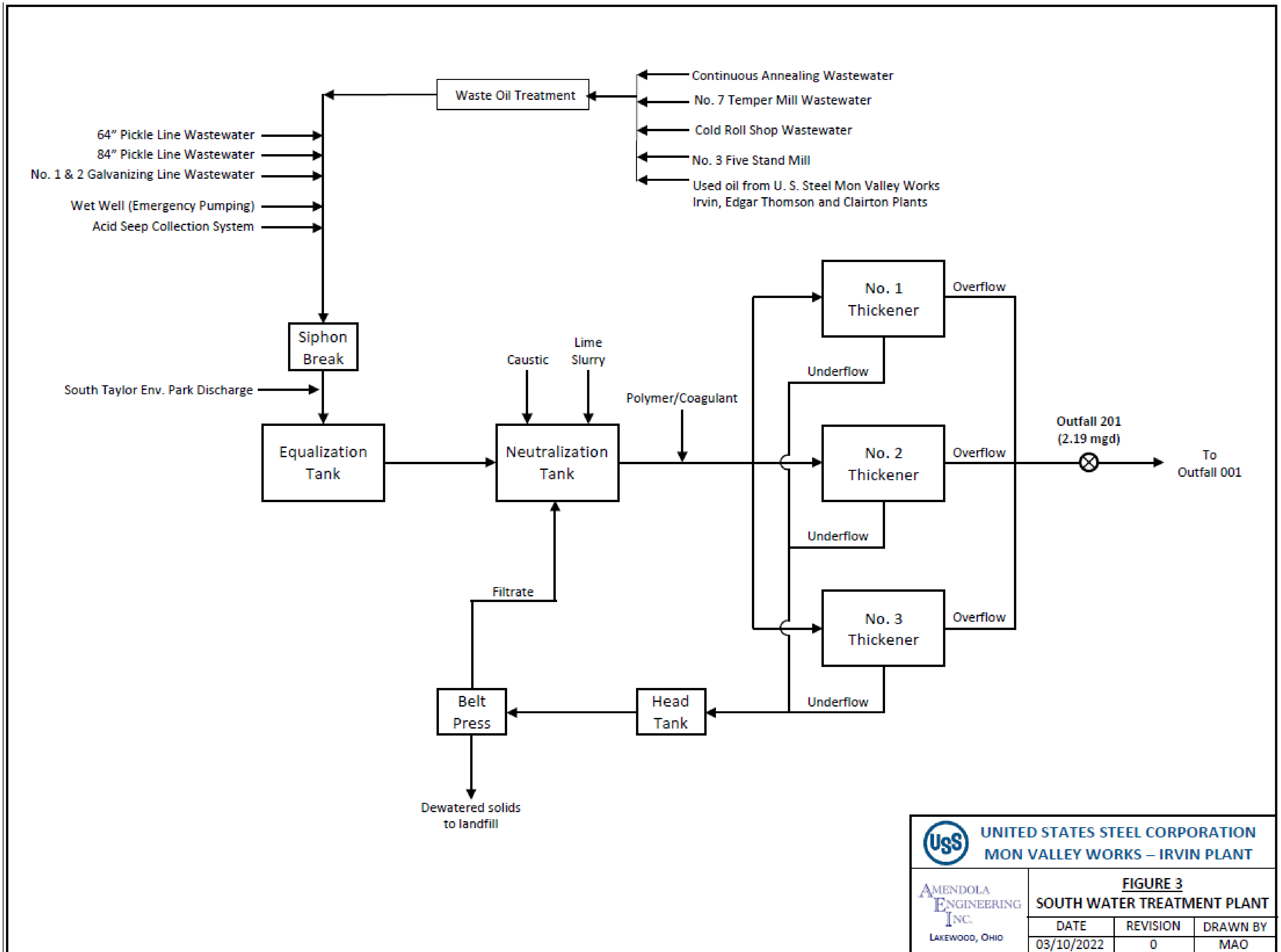
Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.720	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.170	

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)**

Attachment I:

Site Flow Diagrams


MONONGAHELA RIVER
Outfall 001 (23.6 MGD)
Outfall 002 (variable flow)
Outfall 003 (1.72 mgd)
Outfall 004 (variable flow)
Municipal storm sewer
Storm water
Groundwater
Outfall 101 (0.048 MGD)
Sanitary Treatment Plant
Pumphouse Screen Backwash
River Water
River Pump House (Intake Water)
Outfall 201 (2.19 mgd)
South Taylor Environmental Park Discharge
South Water Treatment Plant (All influent streams combined at Eq. Tank – Outfall 201)
Acid Seep Collection System
Emergency Pumping
Pump Station (Wet Well)
NCCW
Continuous Annealing
Waste Oil from Sumps at Irvin Plant
Waste Oil Hauled Off-Site
Waste Oil from ET and Clairton Works
Waste Oil Treatment
Process Water
Miscellaneous Cooling
No. 7 Recoil No. 11 Shear
River Water to Plant Facilities
64" Pickle Line
84" Pickle Line
No. 3 Five Stand Cold Reduction Mill
Outfall 501 (Emergency Overflow)
Cooling Pond
Hot Roll Shop
Reheat Furnace
80" Hot Strip Mill
Outfall 601 (Emergency Overflow)
North Scale Pit
South Scale Pit
Oil Collected and Hauled Offsite
Outfall 701 (Emergency Overflow)
North Water Treatment Plant (All Influent Streams Combined at Eq. Tank - Outfall 301)
Outfall 301 (0.952 MGD)
Blowdown
Back-up Strainer Backwash
Cooling Tower
(HPH) Batch Annealing
No. 1 Galvanizing Line
No. 2 Galvanizing Line
No. 7 Temper Mill
No. 2 Boiler and Feedwater Treatment
Cold Roll Shop
Reservoir
Water to Plant Facilities
No. 1, 3, 4 Boilers and Feedwater Treatment
No. 3 Filter Plant
Sludge
Backwash
Treated Water to Plant Facilities
Outfall 005 (variable flow)
Municipal Storm Sewer
Open Cold Annealing
UNITED STATES STEEL CORPORATION
MON VALLEY WORKS – IRVIN PLANT
AMENDOLA ENGINEERING INC. LAKEWOOD, OHIO
FIGURE 2
PLANT WATER FLOW SCHEMATIC
DATE 03/08/2022
REVISION 0
DRAWN BY MAO


Waste Oil Treatment
Continuous Annealing Wastewater
No. 7 Temper Mill Wastewater
Cold Roll Shop Wastewater
No. 3 Five Stand Mill
Used oil from U. S. Steel Mon Valley Works Irvin, Edgar Thomson and Clairton Plants
64" Pickle Line Wastewater
84" Pickle Line Wastewater
No. 1 & 2 Galvanizing Line Wastewater
Wet Well (Emergency Pumping)
Acid Seep Collection System
Siphon Break
South Taylor Env. Park Discharge
Equalization Tank
Caustic
Lime Slurry
Neutralization Tank
Polymer/Coagulant
No. 1 Thickener
Overflow
Underflow
No. 2 Thickener
Overflow
Underflow
No. 3 Thickener
Overflow
Underflow
Outfall 201 (2.19 mgd)
To Outfall 001
Filtrate
Belt Press
Head Tank
Dewatered solids to landfill
UNITED STATES STEEL CORPORATION
MON VALLEY WORKS – IRVIN PLANT
AMENDOLA ENGINEERING INC.
LAKEWOOD, OHIO
FIGURE 3
SOUTH WATER TREATMENT PLANT
DATE
03/10/2022
REVISION
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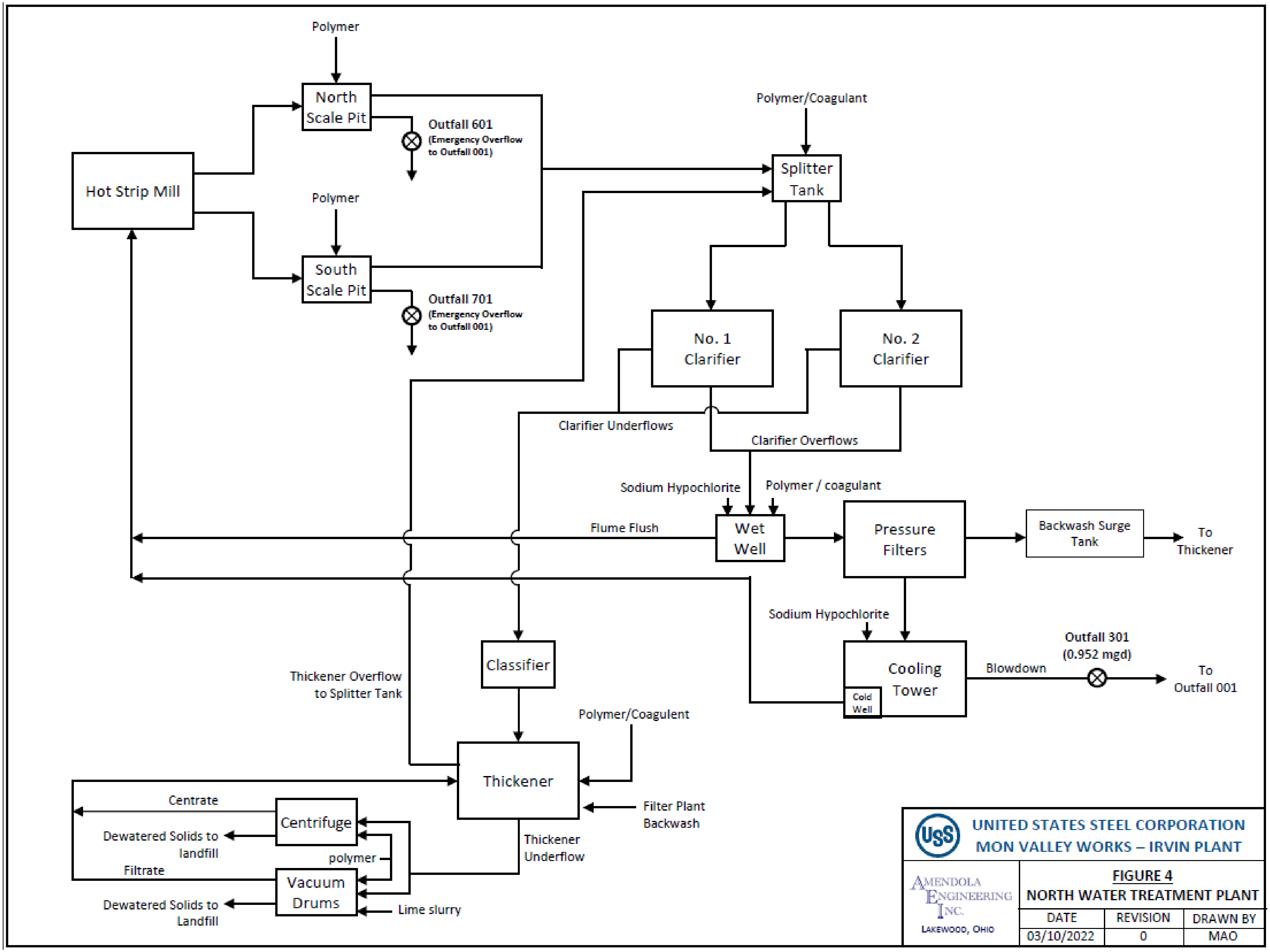
Polymer
North Scale Pit
Outfall 601
(Emergency Overflow to Outfall 001)
Hot Strip Mill
Polymer
South Scale Pit
Outfall 701
(Emergency Overflow to Outfall 001)
Polymer/Coagulant
Splitter Tank
No. 1 Clarifier
No. 2 Clarifier
Clarifier Underflows
Clarifier Overflows
Sodium Hypochlorite
Polymer / coagulant
Flume Flush
Wet Well
Pressure Filters
Backwash Surge Tank
To Thickener
Sodium Hypochlorite
Outfall 301
(0.952 mgd)
Cooling Tower
Cold Well
Blowdown
To Outfall 001
Classifier
Thickener Overflow to Splitter Tank
Polymer/Coagulent
Thickener
Filter Plant Backwash
Thickener Underflow
Centrate
Centrifuge
Dewatered Solids to landfill
polymer
Filtrate
Vacuum Drums
Dewatered Solids to Landfill
Lime slurry
UNITED STATES STEEL CORPORATION
MON VALLEY WORKS – IRVIN PLANT
AMENDOLA ENGINEERING INC.
LAKEWOOD, OHIO
FIGURE 4
NORTH WATER TREATMENT PLANT
DATE
03/10/2022
REVISION
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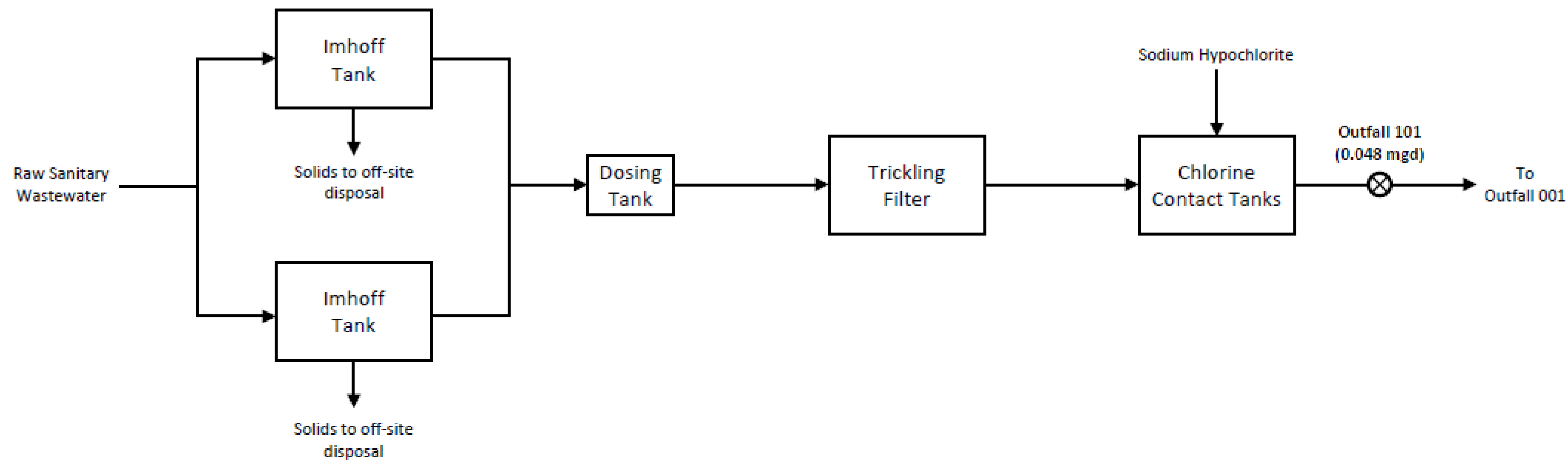

UNITED STATES STEEL CORPORATION MON VALLEY WORKS – IRVIN PLANT		
AMENDOLA ENGINEERING INC. LAKEWOOD, OHIO	FIGURE 5 SANITARY PLANT	
DATE	REVISION	DRAWN BY
03/10/2022	0	MAO