pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0096172**
Facility Type	**Industrial**	APS ID	**46917**
Major / Minor	**Minor**	Authorization ID	**1212378**

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

Applicant and Facility Information

Applicant Name	**Westmoreland County Municipal Authority**	Facility Name	**McKeesport Water System - WTP**
Applicant Address	PO Box 730	Facility Address	1430 Railroad Street
	Greensburg, PA 15601		Mckeesport, PA 15132-4136
Applicant Contact	Max Curtis Fontaine	Facility Contact	Same as Applicant
Applicant Phone	724-755-5950	Facility Phone	Same as Applicant
Client ID	64197	Site ID	242372
SIC Code	4952	Municipality	McKeesport City
SIC Description	Trans. & Utilities - Sewerage Systems	County	Allegheny
Date Application Received	December 29, 2017	EPA Waived?	Yes
Date Application Accepted	May 2, 2019	If No, Reason	
Purpose of Application	Renewal NPDES Permit Coverage		

Summary of Review

The Department received an NPDES permit renewal application from the Municipal Authority of Westmoreland County for the McKeesport Water Treatment Plant (WTP) on December 29, 2017. The McKeesport WTP is a potable water treatment plant that provides approximately 6.8 MGD of potable water for distribution.

The production of potable water is continuous, and the process consists of raw water intake/screening, intake pumping, chemical addition, mixing, flocculation, clarification, mixed media filtration, clear well storage and high-bend pumping to the distribution system. Filter backwash, filter-to-waste, and miscellaneous wastewater flow by gravity to the wastewater sedimentation wet well, which is then pumped to one of two adjacent sedimentation basins before discharging to the Youghiogheny River via Outfall 001.

The site has six outfalls that discharge to the Youghiogheny River, designated in 25 PA Code Chapter 93 as a Warm Water Fishery (WWF). Outfall 001 discharges treated filter backwash, filter-to-waste and a minor amount of drain, lab sink, and stormwater runoff. Outfall 002 discharges intake pump seal water and emergency dewatering flows. Potable water is used in this process as part of the cooling of the intake pumps. The water runs down into the basement of the raw water pump house and collects in a sump. The sump turns on and discharges the water via Outfall 002. Due to the water being potable water, the waste may contain residual chlorine, but it is either consumed by the pathway it takes or a drip feed de-chlorinator is used to comply with the permit limitations. Outfall 003 discharges overflow from settler plate/flocculator tanks. The overflow from the settler plate/flocculator tanks is only discharged if a process shutdown causes the settler plate or flocculator basin to overflow or if more flow enters these basins than can be handled. The quality of this discharge will be similar to that of the wastewater sedimentation basin discharge. Outfall 004 discharges intake traveling screen wash water. The water used to backwash the intake screen is finished potable water. Outfall 005 discharges stormwater runoff from the paved area north/northwest of the WTP via catch basins. Outfall 006 discharges stormwater runoff from a grassy area west of the water treatment building where the wastewater solids are stored within a containment area equipped with contamination containment socks.

Approve	Deny	Signatures	Date
X		Adam Olesnanik / Environmental Engineering Specialist	3-5-20
✓		Michael E. Fifth, P.E. / Environmental Engineer Manager	3-5-2020

Summary of Review

The unique sedimentation facility was completed in the 1990's after the existing treatment plant was constructed. Sections of the previous treatment plant that were underground were converted to use as a pump station wet well and two alternating settling basins. The earth-covered basins have access manholes and were designed to accumulate from five months to one year's volume of settled sludge before the wastewater flow is switched to the other basin and the accumulated sludge is manually pumped out. A portable dewatering unit is used to dewater the sludge. It has been operated near Outfall 001 and the dewatered solids are placed in a containment area within the drainage area of Outfall 006. Each settling basin has a perforated PVC supernatant draw-off pipe connecting to Outfall 001. Wastewater that is treated includes settled water plant sedimentation basin sludge, backwash from the WTP mixed-media filters, filter-to-waste from the mixed-media filters, lab sink water, minor amounts of clean up, color drain, and stormwater runoff from the unloading dock and south driveway area.

Outfalls 003, 005, and 006 do not have any limitations in the current permit but after reviewing the renewal application, monitoring requirement and effluent limitations will be evaluated at these outfalls. Based on the description of the wastewater that is discharged via Outfall 003, the effluent quality will be similar to Outfall 001; therefore, Outfall 003 will receive the same limitations as Outfall 001. Outfall 003 will receive a once per discharge sample frequency because it is an emergency discharge and does not occur frequently. Sample results within the application for Outfall 005 indicate elevated levels of total dissolved solids and chloride in the discharge, and thus isn't considered an uncontaminated stormwater outfall. Monitoring requirements will be imposed on Outfall 005. Outfall 006 will also receive monitoring requirements because even though the wastewater solids storage area is contained, industrial activity occurs within the drainage area of Outfall 006 and there is still a potential to contaminate the stormwater runoff. Monitoring will ensure that the best management practices (BMPs) are properly maintained.

The site was last inspected on July 2, 2019, two violations were noted and has since been resolved. The permittee has no open violations.

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	Design Flow (MGD)	0.341
Latitude	40º 20' 24"	Longitude	-79º 51' 43"
Quad Name	McKeesport	Quad Code	1607
Wastewater Description:	IW Process Effluent without ELG and Stormwater		

Receiving Waters	Youghiogheny River (WWF)	Stream Code	37456
NHD Com ID	69911803	RMI	1.3
Drainage Area	1760	Yield (cfs/mi^2)	0.29
Q_{7-10} Flow (cfs)	510	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	715	Slope (ft/ft)	
Watershed No.	19-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	

Nearest Downstream Public Water Supply Intake	PA American Water Co – Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1,230
PWS RMI	4.60	Distance from Outfall (mi)	12.35

Discharge, Receiving Waters and Water Supply Information

Outfall No.	002	Design Flow (MGD)	0.001
Latitude	40º 20' 19"	Longitude	-79º 51' 36"
Quad Name	McKeesport	Quad Code	1607
Wastewater Description:	IW Process Effluent without ELG		

Receiving Waters	Youghiogheny River (WWF)	Stream Code	37456
NHD Com ID	69911803	RMI	1.4
Drainage Area	1760	Yield (cfs/mi^2)	0.29
Q_{7-10} Flow (cfs)	510	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	715	Slope (ft/ft)	
Watershed No.	19-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	

Nearest Downstream Public Water Supply Intake	PA American Water Co – Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1,230
PWS RMI	4.60	Distance from Outfall (mi)	12.45

Discharge, Receiving Waters and Water Supply Information

Outfall No.	003	Design Flow (MGD)	0.0
Latitude	40º 20' 23"	Longitude	-79º 51' 38"
Quad Name	McKeesport	Quad Code	1607
Wastewater Description:	IW Process Effluent without ELG		

Receiving Waters	Youghiogheny River (WWF)	Stream Code	37456
NHD Com ID	69911803	RMI	1.35
Drainage Area	1760	Yield (cfs/mi^2)	0.29
Q_{7-10} Flow (cfs)	510	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	715	Slope (ft/ft)	
Watershed No.	19-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	

Nearest Downstream Public Water Supply Intake	PA American Water Co – Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1,230
PWS RMI	4.60	Distance from Outfall (mi)	12.4

Discharge, Receiving Waters and Water Supply Information

Outfall No.	004	Design Flow (MGD)	0.05
Latitude	40º 20' 19"	Longitude	-79º 51' 36"
Quad Name	McKeesport	Quad Code	1607
Wastewater Description:	IW Process Effluent without ELG		

Receiving Waters	Youghiogheny River (WWF)	Stream Code	37456
NHD Com ID	69911803	RMI	1.4
Drainage Area	1760	Yield (cfs/mi^2)	0.29
Q_{7-10} Flow (cfs)	510	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	715	Slope (ft/ft)	
Watershed No.	19-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	

Nearest Downstream Public Water Supply Intake	PA American Water Co – Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1,230
PWS RMI	4.60	Distance from Outfall (mi)	12.45

Discharge, Receiving Waters and Water Supply Information

Outfall No.	005	Design Flow (MGD)	0.0
Latitude	40º 20' 20"	Longitude	-79º 51' 38"
Quad Name	McKeesport	Quad Code	1607
Wastewater Description:	Stormwater		

Receiving Waters	Youghiogheny River (WWF)	Stream Code	37456
NHD Com ID	69911803	RMI	1.4
Drainage Area	1760	Yield (cfs/mi^2)	0.29
Q_{7-10} Flow (cfs)	510	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	715	Slope (ft/ft)	
Watershed No.	19-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	

Nearest Downstream Public Water Supply Intake	PA American Water Co – Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1,230
PWS RMI	4.60	Distance from Outfall (mi)	12.45

Discharge, Receiving Waters and Water Supply Information

Outfall No.	006	Design Flow (MGD)	0.0
Latitude	40º 20' 23"	Longitude	-79º 51' 42"
Quad Name	McKeesport	Quad Code	1607
Wastewater Description:	Stormwater		

Receiving Waters	Youghiogheny River (WWF)	Stream Code	37456
NHD Com ID	69911803	RMI	1.3
Drainage Area	1760	Yield (cfs/mi^2)	0.29
Q_{7-10} Flow (cfs)	510	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	715	Slope (ft/ft)	
Watershed No.	19-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	

Nearest Downstream Public Water Supply Intake	PA American Water Co – Pittsburgh		
PWS Waters	Monongahela River	Flow at Intake (cfs)	1,230
PWS RMI	4.60	Distance from Outfall (mi)	12.35

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.341
Latitude 40º 20' 24" **Longitude** -79º 51' 43"
Wastewater Description: Treated Filter Backwash, filter-to-waste and minor amounts of drain, lab sink and stormwater runoff

Technology-Based Limitations

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

Regulatory Effluent Standards and Monitoring Requirements

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

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

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

Table 1. Regulatory Effluent Standards

Parameter	Monthly Avg	Daily Max	IMAX
Flow	Monitor	Monitor	----
pH	6-9 at all times		----
TRC	0.5 mg/l	----	1.6 mg/l

Best Practicable Control Technology Currently Achievable (BPT)

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

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

Parameter	Monthly Avg (mg/l)	Daily Max (mg/l)
Suspended solids	30.0	60.0
Iron (total)	2.0	4.0
Aluminum (total)	4.0	8.0
Manganese (total)	1.0	2.0
Flow	Monitor	----
pH	6-9 at all times	
Total Residual Chlorine	0.5	1.0

Total Dissolved Solids (TDS)

Integral to the implementation of 25 Pa. Code § 95.10 is the principle that existing, authorized mass loadings of TDS are exempt from any treatment requirements under these provisions. Existing mass loadings of TDS up to and including the maximum daily discharge loading for any existing discharge, provided that the loading was authorized prior to August 21, 2010 are exempt. Discharge loadings of TDS authorized by the Department are typically exempt from the treatment requirements of Chapter 95.10 until the net TDS loading is increased, an existing discharge proposes a hydraulic expansion or a change in the waste stream. If there are existing mass or production-based TDS effluent limits, then these are used as the basis for the existing mass loading. The facility is not new or expanding waste loading of TDS, therefore, the facility is exempt from 25 Pa. Code § 95.10 treatment requirements.

Water Quality-Based Limitations

Toxics Screening Analysis – Procedures for Evaluating Reasonable Potential and Developing WQBELs

DEP's procedures for evaluating reasonable potential are as follows:

1. For IW discharges, the design flow to use in modeling is the average flow during production or operation, and may be taken from the permit application.

2. Perform a Toxics Screening Analysis to identify toxic pollutants of concern. 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 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]. List all toxic pollutants of concern in a Toxics Screening Analysis section of the fact sheet (see Attachment B).

3. For any outfall with an applicable design flow, perform PENTOXSD modeling for all pollutants of concern. Use the maximum reported value from the application form or from DMRs as the input concentration for the PENTOXSD model run.

4. Compare the actual WQBEL from PENTOXSD with the maximum concentration reported on DMRs or the permit application. Use WQN data or another source to establish the existing or background concentration for naturally occurring pollutants, but generally assume zero background concentration for non-naturally occurring pollutants.

    - Establish limits in the draft permit where the maximum reported concentration equals or exceeds 50% of the WQBEL. Use the average monthly and maximum daily limits for the permit as recommended by PENTOXSD. Establish an IMAX limit at 2.5 times the average monthly limit.

    - For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.

    - For conservative pollutants, establish monitoring requirements 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 collected on a spreadsheet titled "Toxics Screening Analysis." (Attachment B). Based on the Toxics Screening Analysis, the only parameter recommend for modeling is Total Phenols. Total Phenols was not run in PENTOXSD because it is a potable water supply parameter and the nearest Potable Water Supply is greater than 12 miles away from the discharge point on a River with more than double the stream flow. Based on this information no WQBELs from the Toxics Screening Analysis is proposed for Outfall 001.

Total Residual Chlorine

To determine if WQBELs are required for discharges containing total residual chlorine (TRC), a discharge evaluation is performed using a DEP program called TRC_CALC created with Microsoft Excel for Windows. TRC_CALC calculates TRC Waste Load Allocations (WLAs) through the application of a mass balance model which considers TRC losses due to stream and discharge chlorine demands and first-order chlorine decay. Input values for the program include flow rates and chlorine demands for the receiving stream and the discharge, the number of samples taken per month, coefficients of TRC variability, partial mix factors, and an optional factor of safety. The mass balance model calculates WLAs for acute and chronic criteria that are then converted to long term averages using calculated multipliers. The multipliers are functions of the number of samples taken per month and the TRC variability coefficients (normally kept at default values unless site specific information is available). The most stringent limitation between the acute and chronic long-term averages is converted to an average monthly limit for comparison to the BAT average monthly limit of 0.5 mg/l from 25 Pa. Code § 92a.48(b)(2). The more stringent of these average monthly TRC limitations is imposed in the permit. The results of the modeling, included in Attachment C, indicate that no WQBELs are required for TRC.

Anti-Backsliding

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 and are displayed below in Table 3.

Table 3: Current Permit Effluent Limits

Parameters	Mass (lb/day)		Concentration (mg/l)			
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX
Total Suspended Solids	XXX	XXX	XXX	30	XXX	60
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.0
Total Aluminum	XXX	XXX	XXX	4.0	XXX	8.0
Total Iron	XXX	XXX	XXX	2.0	XXX	4.0
Total Manganese	XXX	XXX	XXX	1.0	XXX	2.0
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0

Proposed Effluent Limitations for Outfall 001

The proposed effluent limitations and monitoring requirements for Outfall 001 are shown below in Table 4. Note that some values were incorrectly labeled as IMAX values in the previous permit when they should have been labeled as Daily Max, this has been changed to reflect existing permitting practices. The monitoring frequency will remain the same as the current permit, twice per month.

Table 4: Proposed Effluent Limitation for Outfall 001

Parameters	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	2/Month	Measure
Total Suspended Solids	XXX	XXX	XXX	30.0	60.0	XXX	2/Month	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	1.0	XXX	2/Month	Grab
Total Aluminum	XXX	XXX	XXX	4.0	8.0	XXX	2/Month	Grab
Total Iron	XXX	XXX	XXX	2.0	4.0	XXX	2/Month	Grab
Total Manganese	XXX	XXX	XXX	1.0	2.0	XXX	2/Month	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	2/Month	Grab

Development of Effluent Limitations

Outfall No. 002 **Design Flow (MGD)** 0.001
Latitude 40º 20' 19" **Longitude** -79º 51' 36"
Wastewater Description: Intake pump seal water and emergency dewatering flows

Technology-Based Limitations

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

Regulatory Effluent Standards and Monitoring Requirements

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1) which is displayed in Table 5 below.

Effluent standards for pH are also imposed on industrial wastes by 25 Pa. Code §§ 95.2(1) which is displayed in Table 5 below.

Pennsylvania regulations at 25 Pa. Code § 92a.48(b) require the imposition of technology-based TRC limits for facilities that use chlorination and that are not already subject to TRC limits based on applicable federal ELGs or a facility-specific BPJ evaluation which is displayed in Table 5 below.

Table 5. Regulatory Effluent Standards

Parameter	Monthly Avg	Daily Max	IMAX
Flow	Monitor	Monitor	----
pH	6-9 at all times		----
TRC	0.5 mg/l	----	1.6 mg/l

Best Practicable Control Technology Currently Achievable (BPT)

BPT for wastewater from treatment of WTP sludges and filter backwash is found in DEPs Technology-Based Control Requirements for Water Treatment Plant Wastes Document which falls under Best Professional Judgement under 40 CFR § 125.3 and the limits imposed are displayed in Table 6 below.

Table 6. BPT Limits for WTP sludge and filter backwash wastewater

Parameter	Monthly Avg (mg/l)	Daily Max (mg/l)
Suspended solids	30.0	60.0
Iron (total)	2.0	4.0
Aluminum (total)	4.0	8.0
Manganese (total)	1.0	2.0
Flow	Monitor	----
pH	6-9 at all times	
Total Residual Chlorine	0.5	1.0

Total Dissolved Solids (TDS)

Integral to the implementation of 25 Pa. Code § 95.10 is the principle that existing, authorized mass loadings of TDS are exempt from any treatment requirements under these provisions. Existing mass loadings of TDS up to and including the maximum daily discharge loading for any existing discharge, provided that the loading was authorized prior to August 21, 2010 are exempt. Discharge loadings of TDS authorized by the Department are typically exempt from the treatment requirements of Chapter 95.10 until the net TDS loading is increased, an existing discharge proposes a hydraulic expansion or a change in the waste stream. If there are existing mass or production-based TDS effluent limits, then these are used as the basis for the existing mass loading. The facility is not new or expanding waste loading of TDS, therefore, the facility is exempt from 25 Pa. Code § 95.10 treatment requirements.

Water Quality-Based Limitations

Toxics Screening Analysis – Procedures for Evaluating Reasonable Potential and Developing WQBELs

DEP's procedures for evaluating reasonable potential are as follows:

3. For IW discharges, the design flow to use in modeling is the average flow during production or operation, and may be taken from the permit application.

4. Perform a Toxics Screening Analysis to identify toxic pollutants of concern. 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 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]. List all toxic pollutants of concern in a Toxics Screening Analysis section of the fact sheet (see Attachment D).

3. For any outfall with an applicable design flow, perform PENTOXSD modeling for all pollutants of concern. Use the maximum reported value from the application form or from DMRs as the input concentration for the PENTOXSD model run.

4. Compare the actual WQBEL from PENTOXSD with the maximum concentration reported on DMRs or the permit application. Use WQN data or another source to establish the existing or background concentration for naturally occurring pollutants, but generally assume zero background concentration for non-naturally occurring pollutants.

    - Establish limits in the draft permit where the maximum reported concentration equals or exceeds 50% of the WQBEL. Use the average monthly and maximum daily limits for the permit as recommended by PENTOXSD. Establish an IMAX limit at 2.5 times the average monthly limit.

    - For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.

    - For conservative pollutants, establish monitoring requirements 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 collected on a spreadsheet titled "Toxics Screening Analysis." (Attachment D). Based on the Toxics Screening Analysis, the only parameter recommend for modeling is Total Phenols. Total Phenols was not run in PENTOXSD because it is a potable water supply parameter and the nearest Potable Water Supply is greater than 12 miles away from the discharge point on a River with more than double the stream flow. Based on this information no WQBELs from the Toxics Screening Analysis is proposed for Outfall 002.

Total Residual Chlorine

To determine if WQBELs are required for discharges containing total residual chlorine (TRC), a discharge evaluation is performed using a DEP program called TRC_CALC created with Microsoft Excel for Windows. TRC_CALC calculates TRC Waste Load Allocations (WLAs) through the application of a mass balance model which considers TRC losses due to stream and discharge chlorine demands and first-order chlorine decay. Input values for the program include flow rates and chlorine demands for the receiving stream and the discharge, the number of samples taken per month, coefficients of TRC variability, partial mix factors, and an optional factor of safety. The mass balance model calculates WLAs for acute and chronic criteria that are then converted to long term averages using calculated multipliers. The multipliers are functions of the number of samples taken per month and the TRC variability coefficients (normally kept at default values unless site specific information is available). The most stringent limitation between the acute and chronic long-term averages is converted to an average monthly limit for comparison to the BAT average monthly limit of 0.5 mg/l from 25 Pa. Code § 92a.48(b)(2). The more stringent of these average monthly TRC limitations is imposed in the permit. The results of the modeling, included in Attachment C, indicate that no WQBELs are required for TRC.

Anti-Backsliding

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 and are displayed below in Table 7.

Table 7: Current Permit Effluent Limits

Parameters	Mass (lb/day)		Concentration (mg/l)			
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX
Total Suspended Solids	XXX	XXX	XXX	30	XXX	60
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.0
Total Aluminum	XXX	XXX	XXX	4.0	XXX	8.0
Total Iron	XXX	XXX	XXX	2.0	XXX	4.0
Total Manganese	XXX	XXX	XXX	1.0	XXX	2.0
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0

Proposed Effluent Limitations for Outfall 002

The proposed effluent limitations and monitoring requirements for Outfall 002 are shown below in Table 8. Note that some values were incorrectly labeled as IMAX values in the previous permit when they should have been labeled as Daily Max, this has been changed to reflect existing permitting practices. The monitoring frequency will remain the same as the current permit, twice per month.

Table 8: Proposed Effluent Limitation for Outfall 002

Parameters	Mass (lb/day)		Concentration				Monitoring Requirements	
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	2/Month	Measure
Total Suspended Solids (mg/L)	XXX	XXX	XXX	30.0	60.0	XXX	2/Month	Grab
Total Residual Chlorine (mg/L)	XXX	XXX	XXX	0.5	1.0	XXX	2/Month	Grab
Total Aluminum (mg/L)	XXX	XXX	XXX	4.0	8.0	XXX	2/Month	Grab
Total Iron (mg/L)	XXX	XXX	XXX	2.0	4.0	XXX	2/Month	Grab
Total Manganese (mg/L)	XXX	XXX	XXX	1.0	2.0	XXX	2/Month	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	2/Month	Grab

Development of Effluent Limitations

Outfall No. 003 **Design Flow (MGD)** 0.0
Latitude 40º 20' 23" **Longitude** -79º 51' 38"
Wastewater Description: Emergency discharge of partially treated water

Proposed Effluent Limitations for Outfall 003

The proposed effluent limitations and monitoring requirements for Outfall 003 are shown below in Table 9. The effluent from this emergency discharge will have the similar quality of the discharge from Outfall 001; therefore, the limitations imposed on Outfall 001 will be imposed on Outfall 003. The monitoring frequency will be once per discharge because the discharge is an emergency overflow.

Table 9: Proposed Effluent Limitation for Outfall 003

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	XXX	XXX	XXX	30.0	60.0	XXX	1/discharge	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	1.0	XXX	1/discharge	Grab
Total Aluminum	XXX	XXX	XXX	4.0	8.0	XXX	1/discharge	Grab
Total Iron	XXX	XXX	XXX	2.0	4.0	XXX	1/discharge	Grab
Total Manganese	XXX	XXX	XXX	1.0	2.0	XXX	1/discharge	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/discharge	Grab

Development of Effluent Limitations

Outfall No.	004	**Design Flow (MGD)**	0.05
Latitude	40º 20' 19"	**Longitude**	-79º 51' 36"

Wastewater Description: Intake Traveling Screen Wash Water

Technology-Based Limitations

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

Regulatory Effluent Standards and Monitoring Requirements

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1) which is displayed in Table 10 below.

Effluent standards for pH are also imposed on industrial wastes by 25 Pa. Code §§ 95.2(1) which is displayed in Table 10 below.

Pennsylvania regulations at 25 Pa. Code § 92a.48(b) require the imposition of technology-based TRC limits for facilities that use chlorination and that are not already subject to TRC limits based on applicable federal ELGs or a facility-specific BPJ evaluation which is displayed in Table 10 below.

Table 10. Regulatory Effluent Standards

Parameter	Monthly Avg	Daily Max	IMAX
Flow	Monitor	Monitor	----
pH	6-9 at all times		----
TRC	0.5 mg/l	----	1.6 mg/l

Water Quality-Based Limitations

Toxics Screening Analysis – Procedures for Evaluating Reasonable Potential and Developing WQBELs

DEP's procedures for evaluating reasonable potential are as follows:

5. For IW discharges, the design flow to use in modeling is the average flow during production or operation, and may be taken from the permit application.

6. Perform a Toxics Screening Analysis to identify toxic pollutants of concern. 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 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]. List all toxic pollutants of concern in a Toxics Screening Analysis section of the fact sheet (see Attachment E).

3. For any outfall with an applicable design flow, perform PENTOXSD modeling for all pollutants of concern. Use the maximum reported value from the application form or from DMRs as the input concentration for the PENTOXSD model run.

4. Compare the actual WQBEL from PENTOXSD with the maximum concentration reported on DMRs or the permit application. Use WQN data or another source to establish the existing or background concentration for naturally occurring pollutants, but generally assume zero background concentration for non-naturally occurring pollutants.

    - Establish limits in the draft permit where the maximum reported concentration equals or exceeds 50% of the WQBEL. Use the average monthly and maximum daily limits for the permit as recommended by PENTOXSD. Establish an IMAX limit at 2.5 times the average monthly limit.

    - For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.

    - For conservative pollutants, establish monitoring requirements 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 collected on a spreadsheet titled "Toxics Screening Analysis." (Attachment E).

PENTOXSD Water Quality Modeling Program

PENTOXSD Version 2.0 for Windows is a single discharge, mass-balance water quality modeling program 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 and discharge flow rate are entered into PENTOXSD 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. Pollutants are then selected for analysis based on those present or likely to be present in a discharge at levels that may cause, have the reasonable potential to cause, or contribute to excursions above state water quality standards (i.e., a reasonable potential analysis). Discharge concentrations for the selected pollutants are chosen to represent the "worst case" quality of the discharge (i.e., maximum reported discharge concentrations). PENTOXSD then evaluates each pollutant 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, PENTOXSD recommends average monthly and maximum daily WQBELs.

Reasonable Potential Analysis and WQBEL Development for Outfall 004

Table 11: PENTOXSD Inputs

Parameter	**Value**
River Mile Index	1.4
Discharge Flow (MGD)	0.05
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	1760
Q_{7-10} (cfs)	510
Low-flow yield (cfs/mi^2)	0.29
Elevation (ft)	715
Slope	0.001

Discharges from Outfall 004 are evaluated based on concentrations reported on the application and on DMRs; data from those sources are used for toxics screening as described above. The PENTOXSD model is run with the discharge and receiving stream characteristics shown in Table 11. The pollutants selected for analysis include those identified as candidates for modeling by the Toxics Screening Analysis spreadsheet (in accordance with Step 2 of the Toxics Screening Analysis procedure discussed above). Pollutants for which water quality standards have not been promulgated (e.g., TSS, oil and grease) are excluded from the analysis. Based on the Toxics Screening Analysis, the parameters recommend for modeling are Total Copper, Total Phenols and Total Zinc. Total Phenols was not run in PENTOXSD because it is a potable water supply parameter and the nearest Potable Water Supply is greater than 12 miles away from the discharge point on a River with more than double the stream flow. The PENTOXSD model run in included in Attachment F.

The WQBELs calculated using PENTOXSD are compared to the maximum reported effluent concentrations as described in the Toxics Screening Analysis section above to evaluate the need to impose WQBELs or monitoring requirements in the permit. Based on the recommendations of the Toxics Screening Analysis, no WQBELs based on the water quality analysis are proposed

Total Residual Chlorine

To determine if WQBELs are required for discharges containing total residual chlorine (TRC), a discharge evaluation is performed using a DEP program called TRC_CALC created with Microsoft Excel for Windows. TRC_CALC calculates TRC Waste Load Allocations (WLAs) through the application of a mass balance model which considers TRC losses due to stream and discharge chlorine demands and first-order chlorine decay. Input values for the program include flow rates and chlorine demands for the receiving stream and the discharge, the number of samples taken per month, coefficients of TRC variability, partial mix factors, and an optional factor of safety. The mass balance model calculates WLAs for acute and chronic criteria that are then converted to long term averages using calculated multipliers. The multipliers are functions of the number of samples taken per month and the TRC variability coefficients (normally kept at default values unless site specific information is available). The most stringent limitation between the acute and chronic long-term averages is converted to an average monthly limit for comparison to the BAT average monthly limit of 0.5 mg/l from 25 Pa. Code § 92a.48(b)(2). The more stringent of these average monthly TRC limitations is imposed in the permit. The results of the modeling, included in Attachment C, indicate that no WQBELs are required for TRC.

Anti-Backsliding

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 and are displayed below in Table 12.

Table 12: Current Permit Effluent Limits

Parameters	Mass (lb/day)		Concentration (mg/l)			
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum
Total Residual Chlorine	XXX	XXX	XXX	Report	Report	XXX

Proposed Effluent Limitations for Outfall 004

The proposed effluent limitations and monitoring requirements for Outfall 004 are shown below in Table 13. The monitoring frequency will remain the same as the current permit, twice per month.

Table 13: Proposed Effluent Limitation for Outfall 004

Parameters	Mass (lb/day)		Concentration				Monitoring Requirements	
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	2/Month	Measure
Total Residual Chlorine (mg/L)	XXX	XXX	XXX	0.5	1.0	XXX	2/Month	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	2/Month	Grab

Development of Effluent Limitations

Outfall No. 005 **Design Flow (MGD)** 0.0
Latitude 40º 20' 20" **Longitude** -79º 51' 38"
Wastewater Description: Stormwater

Technology-Based Limitations

Outfall 005 will be subjected to the monitoring requirements in Appendix J of the PAG-03 General Stormwater Permit as a minimum requirement because the outfall receives stormwater. The SIC code for the site is 4941 and the corresponding appendix that would apply to the facility is Appendix J of the PAG-03 and the reporting requirements are in Table 14 below.

Table 14: PAG-03 Appendix J Monitoring Requirements

Parameters	Mass (lb/day)		Concentration (mg/l)			
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum
Total Suspended Solids (TSS)	XXX	XXX	XXX	XXX	Report	XXX
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX

Water Quality-Based Limitations

Water quality analyses are typically performed under low-flow (Q&-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 are not proposed.

Total Dissolved Solids, Chloride, Bromide, and Sulfate

TDS and its major constituents including chloride, bromide and sulfate have emerged as pollutants of concern in several major watersheds in the Commonwealth. The conservative nature of these solids allows them to accumulate in surface waters and they may remain a concern even if the immediate downstream public water supply is not directly impacted. Bromide has been linked to the formation of disinfection byproducts at increased levels in public water systems. In addition, the Environmental Quality Board has directed DEP to collect additional data related to sulfate and chloride. Furthermore, EPA has expressed concern related to bromide and the importance of monitoring all point sources for bromide when it may be present.

Based on the concerns identified above and under the authority of 25 Pa. Code § 92a.61, DEP has determined that it should implement increased monitoring in NPDES permits for TDS, chloride, bromide and sulfate. The new/increased monitoring is prompted for discharges that exceed the following thresholds:

- Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lb/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, chloride, bromide and sulfate. For discharges of 0.1 MGD or less and the TDS concentration in the Discharge exceeds 5,000 mg/L; Part A of the permit should include monitor and report for TDS, chloride, bromide and sulfate.

The discharge concentrations for total dissolved solids that was report in the permit application is 5,680 mg/L; therefore, requiring monitoring for total dissolved solids, chloride, bromide, and sulfate.

Anti-Backsliding

The previous permit did not have any effluent limitation on Outfall 005.

Final Effluent Limitations for Outfall 005

The final effluent limitations and monitoring requirements for Outfall 005 are displayed in Table 15 below. The monitoring frequency is adopted from the PAG-03 General Permit; semi-annual monitoring.

Table 15: Final Effluent Limitation for Outfall 005

Parameters	Mass (lb/day)		Concentration (mg/l)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Total Suspended Solids (TSS)	XXX	XXX	XXX	XXX	Report	XXX	1/6Month	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/6Month	Grab
Total Dissolved Solids (TDS)	XXX	XXX	XXX	XXX	Report	XXX	1/6Month	Grab
Chloride	XXX	XXX	XXX	XXX	Report	XXX	1/6Month	Grab
Bromide	XXX	XXX	XXX	XXX	Report	XXX	1/6Month	Grab
Sulfate	XXX	XXX	XXX	XXX	Report	XXX	1/6Month	Grab

Development of Effluent Limitations

Outfall No. 006 **Design Flow (MGD)** 0
Latitude 40º 20' 23" **Longitude** -79º 51' 42"
Wastewater Description: Stormwater

Technology-Based Limitations

Outfall 006 will be subjected to the monitoring requirements in Appendix J of the PAG-03 General Stormwater Permit as a minimum requirement because the outfall receives stormwater. The SIC code for the site is 4941 and the corresponding appendix that would apply to the facility is Appendix J of the PAG-03 and the reporting requirements are in Table 16 below.

Table 16: PAG-03 Appendix J Monitoring Requirements

Parameters	Mass (lb/day)		Concentration (mg/l)			
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum
Total Suspended Solids (TSS)	XXX	XXX	XXX	XXX	Report	XXX
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX

Water Quality-Based Limitations

Water quality analyses are typically performed under low-flow (Q&-10) conditions. Stormwater discharges occur at variable rates and frequencies but not however during Q7-10 conditions. Since the discharges from Outfall 006 are composed entirely of stormwater, a formal water quality analysis cannot be accurately conducted. Accordingly, water quality-based effluent limitations are not proposed.

Anti-Backsliding

The previous permit did not have any effluent limitation on Outfall 006.

Final Effluent Limitations for Outfall 006

The final effluent limitations and monitoring requirements for Outfall 006 are displayed in Table 17 below. The monitoring frequency is adopted from the PAG-03 General Permit; semi-annual monitoring.

Table 17: Final Effluent Limitation for Outfall 006

Parameters	Mass (lb/day)		Concentration (mg/l)				Monitoring Requirements	
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Total Suspended Solids (TSS)	XXX	XXX	XXX	XXX	Report	XXX	1/6Month	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/6Month	Grab

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

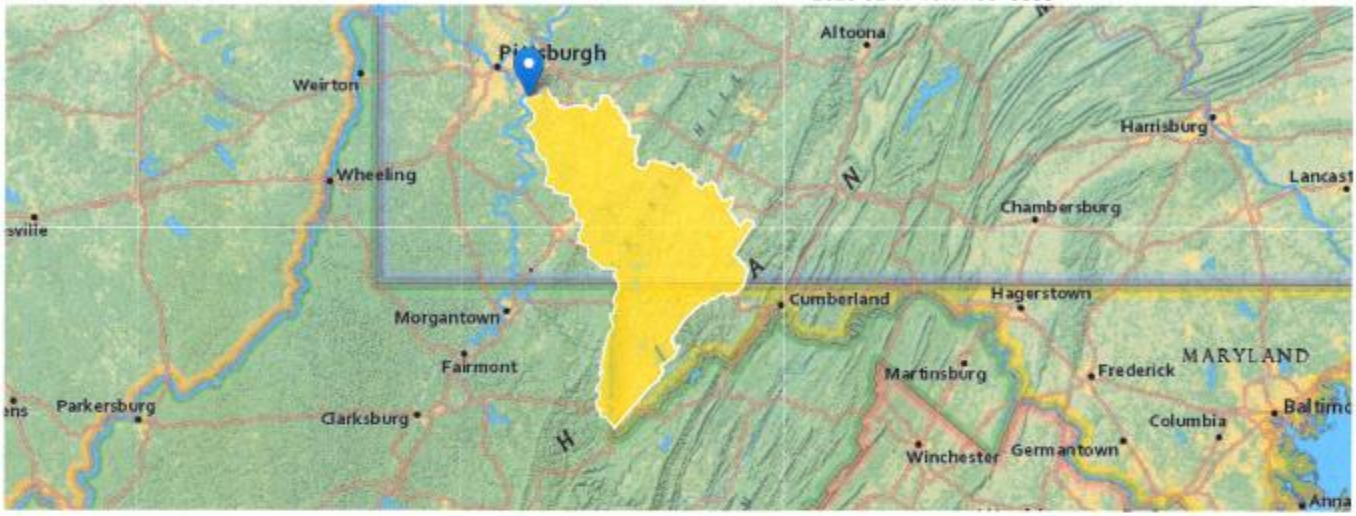
Attachments

Attachment A: StreamStats Drainage Area
Attachment B: Toxics Screening Analysis for Outfall 001
Attachment C: TRC Evaluation Model
Attachment D: Toxics Screening Analysis for Outfall 002
Attachment E: Toxics Screening Analysis for Outfall 004
Attachment F: PENTOXSD model run for Outfall 004
Attachment G: Site Flow Diagram

Attachment A:
StreamStats Drainage Area

StreamStats Report

Region ID:	PA
Workspace ID:	PA20200219151417508000
Clicked Point (Latitude, Longitude):	40.33953, -79.86280
Time:	2020-02-19 10:14:38 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1760	square miles
ELEV	Mean Basin Elevation	1993.6	feet

Low-Flow Statistics Parameters[100 Percent (1760 square miles) Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1760	square miles	2.26	1400
ELEV	Mean Basin Elevation	1993.6	feet	1050	2580

Low-Flow Statistics Disclaimers[100 Percent (1760 square miles) Low Flow Region 4]

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

Low-Flow Statistics Flow Report[100 Percent (1760 square miles) Low Flow Region 4]

Statistic	Value	Unit
7 Day 2 Year Low Flow	214	ft^3/s
30 Day 2 Year Low Flow	300	ft^3/s
7 Day 10 Year Low Flow	110	ft^3/s
30 Day 10 Year Low Flow	141	ft^3/s
90 Day 10 Year Low Flow	224	ft^3/s

Attachment B:
Toxic Screening Analysis for Outfall 001

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.7

CLEAR FORM

Facility: **McKeesport WTP**
NPDES Permit No.: **PA0096172**
Outfall: **001**
Analysis Hardness (mg/L): **100**
Discharge Flow (MGD): **0.341**
Analysis pH (SU): **7**
Stream Flow, Q_{7-10} (cfs): **510**

	Parameter	Maximum Concentration in Application or DMRs (µg/L)		Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Group 1	Total Dissolved Solids		183000	500000	No		
	Chloride		35000	250000	No		
	Bromide		100	N/A	No		
	Sulfate		56000	250000	No		
	Fluoride		50	2000	No		
Group 2	Total Aluminum		441	750	No		
	Total Antimony		0.5	5.6	No		
	Total Arsenic		0.5	10	No		
	Total Barium		51	2400	No		
	Total Beryllium		0.5	N/A	No		
	Total Boron		30	1600	No		
	Total Cadmium		0.1	0.271	No		
	Total Chromium		2	N/A	No		
	Hexavalent Chromium		10	10.4	No		
	Total Cobalt		0.5	19	No		
	Total Copper		0.8	9.3	No		
	Total Cyanide		10	N/A	No		
	Total Iron		131	1500	No		
	Dissolved Iron		20	300	No		
	Total Lead		0.2	3.2	No		
	Total Manganese		891	1000	No		
	Total Mercury	<	0.1	0.05	No (Value < QL)		
	Total Molybdenum		10	N/A	No		
	Total Nickel		5	52.2	No		
	Total Phenols (Phenolics)	<	10	5	Yes		
	Total Selenium		0.5	5.0	No		
	Total Silver		0.1	3.8	No		
	Total Thallium		0.1	0.24	No		
	Total Zinc		7	119.8	No		

Attachment C:
TRC Evaluation Model

TRC EVALUATION

510	= Q stream (cfs)	0.5	= CV Daily
0.392	= 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 =	134.158	**1.3.2.iii**	WLA cfc =	130.786
PENTOXSD TRG	**5.1a**	LTAMULT afc =	0.373	**5.1c**	LTAMULT cfc =	0.581
PENTOXSD TRG	**5.1b**	LTA_afc=	49.990	**5.1d**	LTA_cfc =	76.033

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:
Toxic Screening Analysis for Outfall 002

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.7

CLEAR FORM

Facility: McKeesport WTP
NPDES Permit No.: PA0096172
Outfall: 002
Analysis Hardness (mg/L): 100
Discharge Flow (MGD): 0.001
Analysis pH (SU): 7
Stream Flow, Q_{7-10} (cfs): 510

	Parameter	Maximum Concentration in Application or DMRs (µg/L)		Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Group 1	Total Dissolved Solids		222000	500000	No		
	Chloride		30000	250000	No		
	Bromide		100	N/A	No		
	Sulfate		60000	250000	No		
	Fluoride		50	2000	No		
Group 2	Total Aluminum		50	750	No		
	Total Antimony		0.5	5.6	No		
	Total Arsenic		0.5	10	No		
	Total Barium		32.2	2400	No		
	Total Beryllium		0.5	N/A	No		
	Total Boron		29	1600	No		
	Total Cadmium		0.1	0.271	No		
	Total Chromium		2	N/A	No		
	Hexavalent Chromium		10	10.4	No		
	Total Cobalt		0.2	19	No		
	Total Copper		3.3	9.3	No		
	Total Cyanide		23	N/A	No		
	Total Iron		85	1500	No		
	Dissolved Iron		20	300	No		
	Total Lead		0.2	3.2	No		
	Total Manganese		13	1000	No		
	Total Mercury	<	0.1	0.05	No (Value < QL)		
	Total Molybdenum		10	N/A	No		
	Total Nickel		5	52.2	No		
	Total Phenols (Phenolics)	<	10	5	Yes		
	Total Selenium		0.5	5.0	No		
	Total Silver		0.1	3.8	No		
	Total Thallium		0.1	0.24	No		
	Total Zinc		87	119.8	No		

Attachment E:
Toxic Screening Analysis for Outfall 004

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.7

CLEAR FORM

Facility: McKeesport WTP
NPDES Permit No.: PA0096172
Outfall: 004
Analysis Hardness (mg/L): 100
Discharge Flow (MGD): 0.05
Analysis pH (SU): 7
Stream Flow, Q_{7-10} (cfs): 510

	Parameter	Maximum Concentration in Application or DMRs (µg/L)		Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Group 1	Total Dissolved Solids		178000	500000	No		
	Chloride		34000	250000	No		
	Bromide		100	N/A	No		
	Sulfate		56000	250000	No		
	Fluoride		50	2000	No		
Group 2	Total Aluminum		50	750	No		
	Total Antimony		0.5	5.6	No		
	Total Arsenic		0.5	10	No		
	Total Barium		34.2	2400	No		
	Total Beryllium		0.5	N/A	No		
	Total Boron		24	1600	No		
	Total Cadmium		0.1	0.271	No		
	Total Chromium		2	N/A	No		
	Hexavalent Chromium		0.5	10.4	No		
	Total Cobalt		0.2	19	No		
	Total Copper		58	9.3	Yes	59170.57	No Limits/Monitoring
	Total Cyanide		10	N/A	No		
	Total Iron		571	1500	No		
	Dissolved Iron		20	300	No		
	Total Lead		0.4	3.2	No		
	Total Manganese		23	1000	No		
	Total Mercury	<	0.1	0.05	No (Value < QL)		
	Total Molybdenum		10	N/A	No		
	Total Nickel		5	52.2	No		
	Total Phenols (Phenolics)	<	10	5	Yes		
	Total Selenium		0.5	5.0	No		
	Total Silver		0.1	3.8	No		
	Total Thallium		0.1	0.24	No		
	Total Zinc		139	119.8	Yes	506433.8	No Limits/Monitoring

Attachment F:
PENTOXSD model run for Outfall 004

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
37456	1.40	715.00	1760.00	0.00100	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.1	0	510	0	100	15	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
McKeesport WTP	PA0096172	0.05	0	0	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc	Trib Conc	Disc Daily CV	Disc Hourly CV	Steam Conc	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc
	(µg/L)	(µg/L)			(µg/L)					(µg/L)
COPPER	1E+08	0	0.5	0.5	0	0	0	0	1	0
ZINC	1E+08	0	0.5	0.5	0	0	0	0	1	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
37456	1.00	714.00	1761.00	0.00100	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.1	0	510	0	100	15	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
		0	0	0	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc	Trib Conc	Disc Daily CV	Disc Hourly CV	Steam Conc	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc
	(µg/L)	(µg/L)			(µg/L)					(µg/L)
COPPER	0	0	0.5	0.5	0	0	0	0	1	0
ZINC	0	0	0.5	0.5	0	0	0	0	1	0

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
19D	37456	YOUGHIOGHENY RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
1.400	510	0	510	0.07734	0.001	15	100	6.6667	0.3401	0.0719	7.458
1.000	510	0	510	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
1.400	1727.4	0	1727.4	0.07734	0.001	25.657	100	3.8976	0.6733	0.0363	3.334
1.000	1727.4	0	1727.4	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
1.40	**McKeesport WTP**	**PA0096172**

AFC

Q7-10: **CCT (min)** 7.458 **PMF** 1 **Analysis pH** 7 **Analysis Hardness** 100

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	13.439	13.999	92315.6
	Dissolved WQC. Chemical translator of 0.96 applied.						
ZINC	0	0	0	0	117.18	119.816	790118.1
	Dissolved WQC. Chemical translator of 0.978 applied.						

CFC

Q7-10: **CCT (min)** 7.458 **PMF** 1 **Analysis pH** 7 **Analysis Hardness** 100

Parameter	Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	8.956	9.329	61518.61
	Dissolved WQC. Chemical translator of 0.96 applied.						
ZINC	0	0	0	0	118.139	119.816	790118.1
	Dissolved WQC. Chemical translator of 0.986 applied.						

THH

Q7-10: **CCT (min)** 7.458 **PMF** NA **Analysis pH** NA **Analysis Hardness** NA

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	NA	NA	NA
ZINC	0	0	0	0	NA	NA	NA

CRL

Qh: **CCT (min)** 3.334 **PMF** 1

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	NA	NA	NA
ZINC	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
1.40	**McKeesport WTP**	**PA0096172**

PENTOXSD Analysis Results

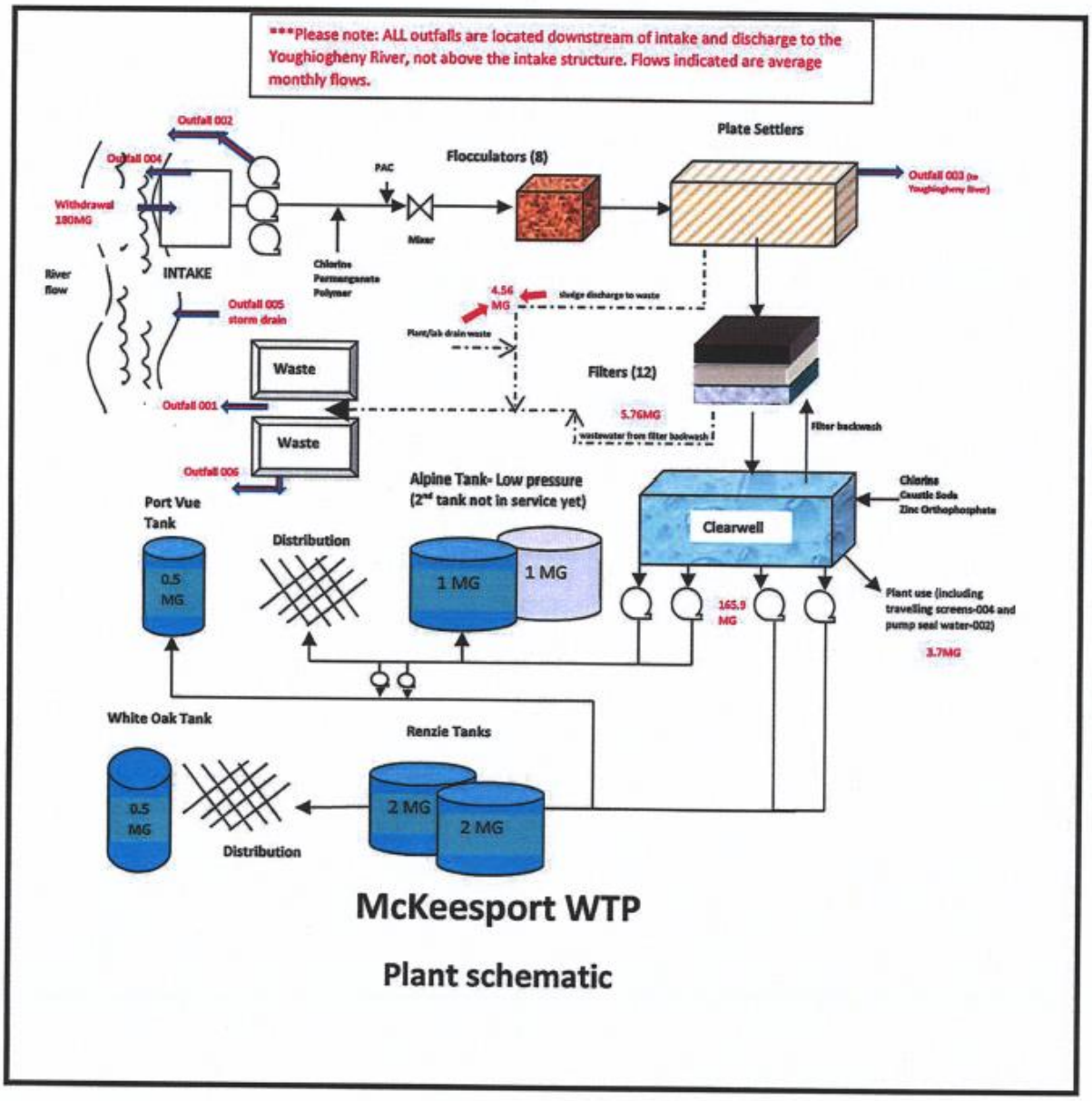
Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
19D	37456	YOUGHIOGHENY RIVER

RMI	Name	Permit Number	Disc Flow (mgd)
1.40	McKeesport WTP	PA0096172	0.0500

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
COPPER	59170.57	AFC	92315.6	59170.57	AFC
ZINC	506433.8	AFC	790118.1	506433.8	AFC

Attachment G:
Site Flow Diagram



Municipal Authority Westmoreland County