Pennsylvania Department of Environmental Protection

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0001201**
Facility Type	**Industrial**	APS ID	**1122781**
Major / Minor	**Major**	Authorization ID	**1501509**

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

Applicant and Facility Information

Applicant Name	**Powerex Inc.**	Facility Name	**Youngwood Plant**
Applicant Address	173 Pavilion Lane	Facility Address	173 Pavilion Lane
	Youngwood, PA 15697-1814		Youngwood, PA 15697-1814
Applicant Contact	John Busato, Facility Manager	Facility Contact	***same as applicant***
Applicant Phone	(724) 925-4403	Facility Phone	***same as applicant***
Applicant Email	john.busato@pwrx.com	Facility Email	***same as applicant***
Client ID	84473	Site ID	242930
SIC/NAICS Code	3674; 334413	Municipality	Hempfield Township
SIC Description	Manufacturing - Semiconductors and Related Devices	County	Westmoreland
Date Application Received	October 2, 2024	EPA Waived?	No
Date Application Accepted	October 3, 2024	If No, Reason	Major Facility
Purpose of Application	Renewal of an NPDES permit for discharges of treated industrial waste, treated sewage, and non-contact cooling water from a semiconductor manufacturing facility.		

Summary of Review

On October 2, 2024, on behalf of Powerex, Inc. (Powerex), CORE Environmental Services, Inc. submitted an application dated September 30, 2024 and received by the Department on October 2, 2024 to renew NPDES Permit PA0001201 for discharges from Powerex's Youngwood Plant. The current permit for the Youngwood Plant was issued on March 6, 2020 with an effective date of April 1, 2020 and an expiration date of March 31, 2025. Powerex's renewal application was timely because it was received at least 180 days prior to expiration (*i.e.*, on or before October 2, 2024), so the terms and conditions of the 2020 permit will be automatically extended pursuant to 25 Pa. Code § 92a.7(b) if DEP does not act on the renewal application before the expiration date.

Powerex's Youngwood Plant is a light electronics manufacturing facility producing discrete devices, modules, and integrated high-power silicon semi-conductors. Products include insulated gate bipolar transistors, rectifiers, thyristors, and custom power modules and assemblies. Operations at this facility include the processing of silicon wafers into packaged devices using acids, bases, and solvents in various chemical processes. These processes include high-temperature electric-fired diffusion furnaces, sandblasting, mechanical lapping, electrical testing, assembly, and packaging of finished products. The property covers 16 acres and includes an administration building, a manufacturing building, a wastewater treatment plant, and storage tanks for the numerous substances needed for Powerex's manufacturing activities.

There are two outfalls and one internal monitoring point at this facility. Internal Monitoring Point (IMP) 101 is the monitoring point for industrial wastewaters treated by an inorganics treatment facility consisting of equalization, neutralization, and clarification unit processes. The industrial wastewaters are subject to effluent limits at IMP 101 from the Federal Effluent Limitations Guidelines for the Metal Finishing Point Source Category, Subpart A – Metal Finishing Subcategory (40 CFR Part 433) and the Electrical and Electronic Components Point Source Category, Subpart A – Semiconductor Subcategory (40 CFR Part 469). The treated industrial wastewaters are directed to a wet well that also receives Powerex's sanitary wastewaters and non-contact cooling water from a cooling tower. The combined wastewater stream from the wet well is treated to remove

Approve	Deny	Signatures	Date
✓		Ryan C. Decker, P.E. / Environmental Engineer	March 14, 2025
X		Michael E. Fifth, P.E. / Environmental Engineer Manager	March 28, 2025

Summary of Review

organic pollutants by a second treatment system consisting of extended aeration, aerobic digestion, clarification, and disinfection unit processes. Treated effluent is then discharged to Sewickley Creek through Outfall 001. Effluent limits at Outfall 001 consist of technology-based limits for secondary treatment, water quality-based effluent limits for CBOD and ammonia-nitrogen, and quarterly monitoring for aluminum, iron, and manganese due to the impairment of streams in the Sewickley Creek Watershed from acid mine drainage. For this permit renewal, reporting requirements for four per- and polyfluoroalkyl substances (PFAS) are added to Outfall 001 according to permitting policy updates in February 2024 (discussed later in this Fact Sheet).

Outfall 002 was added to the previous permit to authorize existing discharges of storm water associated with industrial activities from the Youngwood Plant to an unnamed tributary to Sewickley Creek. The outfall is subject to semi-annual monitoring requirements for TSS, oil and grease, pH, aluminum, iron, and manganese based on the requirements from Appendix J of DEP's PAG-03 NPDES General Permit for Discharges of Stormwater Associated with Industrial Activity. For this permit renewal, reporting requirements for COD, Total Nitrogen, and Total Phosphorus are added to Outfall 002 consistent with updates to the PAG-03 General Permit upon which Powerex's storm water monitoring requirements are based.

In 2023, Powerex proposed to redirect its sanitary wastewaters to the local sanitary sewer operated by the Municipal Authority of Westmoreland County. That project has not been completed so the permit will continue to authorize the discharge of sanitary wastewaters.

In response to DEP's review of the NPDES permit application, DEP sent Powerex a pre-draft survey letter on December 31, 2024. The pre-draft survey letter identified preliminary water quality-based effluent limitations (WQBELs) for Total Aluminum and Total Thallium and water quality-based reporting requirements for Total Mercury based on data reported in the NPDES permit application and in Discharge Monitoring Reports. In its pre-draft survey response, Powerex indicated that the detected values reported for Total Mercury and Total Thallium in the permit application were in error and that there were no detections for either Total Mercury or Total Thallium above DEP's Target Quantitation Limits for those parameters. Revised lab sheets and application pages were submitted in February 2024 to correct the errors.

The new WQBELs for Total Aluminum are based on the Sewickley Creek Total Maximum Daily Load (TMDL), which was prepared by DEP and finalized in 2009 to address impairments in the Sewickley Creek watershed from acid mine drainage. Reporting for Total Aluminum was required under the previous permit to confirm the low levels reported on the previous permit application. However, after reviewing Discharge Monitoring Report data for the current renewal, DEP found that more than 50% of the Total Aluminum results reported under the previous permit exceeded the water quality criterion for Total Aluminum. Therefore, WQBELs for Total Aluminum at levels equivalent to the most stringent water quality criterion (0.75 mg/L) are imposed at Outfall 001 to ensure that Powerex's discharge does not contribute to the impairment of the watershed. Powerex reported in its pre-draft survey that aluminum-containing materials are used onsite and that it was in the process of adjusting the treatment process to consistently achieve results below the WQBELs.

In addition to the Total Aluminum WQBELs, this permit renewal also adds annual reporting requirements for four per- and polyfluoroalkyl substances (PFAS) to Outfall 001 including Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), Perfluorobutanesulfonic acid (PFBS), and Hexafluoropropylene oxide dimer acid (HFPO-DA). The monitoring is part of a statewide initiative to collect data on point source discharges of PFAS.

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)	0.048 (avg.); 0.076 (max)
Latitude	40° 13' 47.69"	Longitude	79° 34' 6.98"
Quad Name	Mount Pleasant	Quad Code	1709
Wastewater Description:	Treated process wastewaters; treated sanitary wastewaters; and non-contact cooling water		
Receiving Waters	Sewickley Creek	Stream Code	37556
NHD Com ID	69912945	RMI	20.4
Drainage Area	44.3	Yield (cfs/mi^2)	0.0329
Q_{7-10} Flow (cfs)	1.46 (0.881 + 66% standard error)	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	940	Slope (ft/ft)	0.0012
Watershed No.	19-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Metals		
Source(s) of Impairment	Abandoned Mine Drainage		
TMDL Status	Final (March 12, 2009)	Name	Sewickley Creek Watershed TMDL

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Westmoreland County Municipal Authority – McKeesport		
PWS ID	5020025	PWS Withdrawal (MGD)	
PWS Waters	Youghiogheny River	Flow at Intake (cfs)	510
PWS RMI	1.30	Distance from Outfall (mi)	29.4

Discharge, Receiving Waters and Water Supply Information			
IMP No.	101	Design Flow (MGD)	0.034 (avg.); 0.073 (max)
Wastewater Description:	Treated process wastewaters from semi-conductor manufacturing (plating, etching, cleaning, and rinsing)		
Receiving Waters	Sewickley Creek via Outfall 001	Stream Code	37556

Changes Since Last Permit Issuance:

Other Comments:

Discharge, Receiving Waters and Water Supply Information

Outfall No.	002	Design Flow (MGD)	Variable
Latitude	40° 13' 54.26"	Longitude	-79° 34' 7.18"
Quad Name	Mount Pleasant	Quad Code	1709
Wastewater Description:	Storm water		
Receiving Waters	Unnamed Tributary to Sewickley Creek (WWF)	Stream Code	37751
NHD Com ID	69912943	RMI	0.09
Drainage Area		Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)		Q_{7-10} Basis	
Elevation (ft)		Slope (ft/ft)	
Watershed No.	19-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Metals		
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Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

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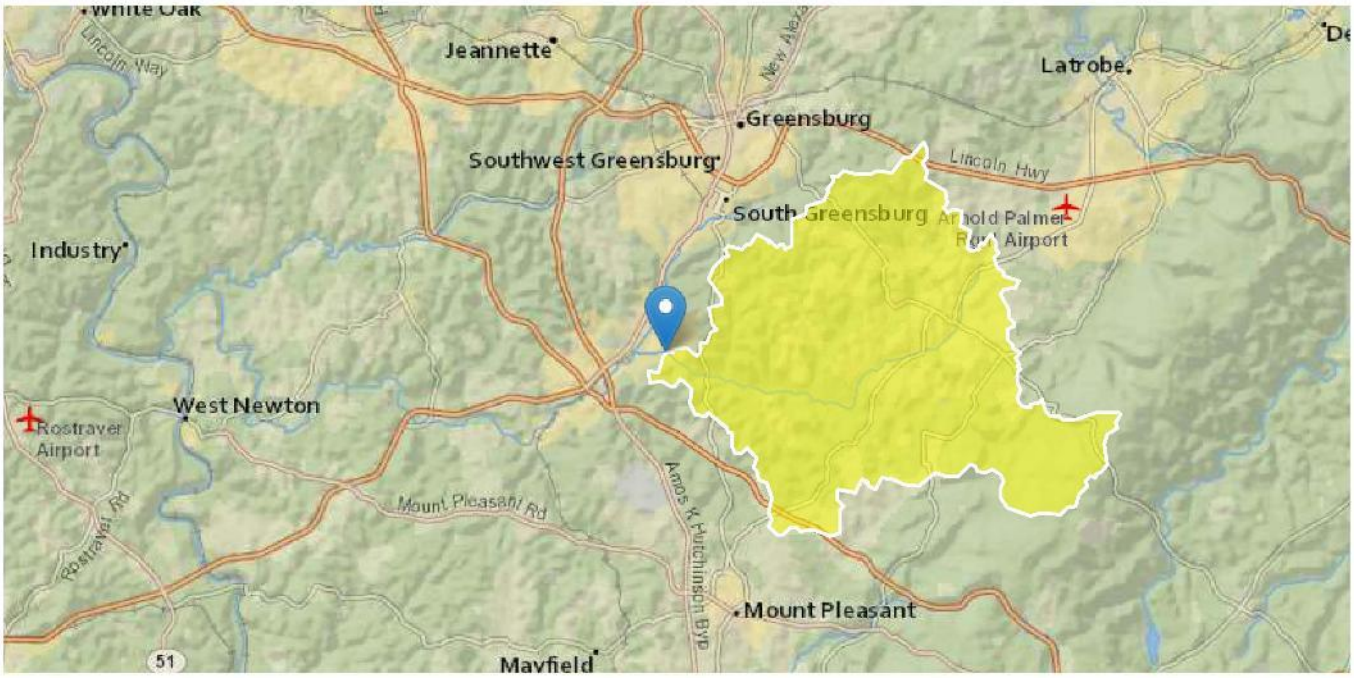
PWS Waters	Youghiogheny River	Flow at Intake (cfs)	510
PWS RMI	1.30	Distance from Outfall (mi)	29.4

Changes Since Last Permit Issuance:

Other Comments:

StreamStats Report

Region ID: PA
Workspace ID: PA20241112191652665000
Clicked Point (Latitude, Longitude): 40.23035, -79.56953
Time: 2024-11-12 14:17:18 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	44.3	square miles
ELEV	Mean Basin Elevation	1198	feet

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	44.3	square miles	2.26	1400
ELEV	Mean Basin Elevation	1198	feet	1050	2580

Low-Flow Statistics Flow Report [Low Flow Region 4]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	2.11	ft^3/s	43	43
30 Day 2 Year Low Flow	3.4	ft^3/s	38	38
7 Day 10 Year Low Flow	0.881	ft^3/s	66	66
30 Day 10 Year Low Flow	1.42	ft^3/s	54	54
90 Day 10 Year Low Flow	2.41	ft^3/s	41	41

Low-Flow Statistics Citations

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

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Application Version: 4.24.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Sewickley Creek-69913077

Assessment Unit ID: PA-SCR-69913077

Waterbody Condition: Impaired (Issues Identified)

Existing Plans for Restoration: Yes

303(d) Listed: Yes

Year Reported: 2024

Other Years Reported: 2016, 2018, 2020, 2022 (opens new browser tab)

Organization Name (ID): Pennsylvania (21PA)

What type of water is this?

Stream/creek/river (1.5777 Miles)

Where is this water located?

HEMPFIELD TWP, 15601 (county: Westmoreland)

Advanced Filtering (opens new browser tab)

Download Waterbody Data (2024)

Assessment Information from 2024

State or Tribal Nation specific designated uses:

Information on Water Quality Standards — Expand All

Warm Water Fishes	Impaired
Water Contact Sports	Impaired

Probable sources contributing to impairment from 2024:

Click a column heading to sort... Clear Filters

Source	Parameter	Confirmed
Filter...	Filter...	Filter...
Acid Mine Drainage	Metals	Yes
Acid Mine Drainage	pH	Yes
Source Unknown	Pathogens	Yes

Click a column heading to sort... Clear Filters

Assessment Documents

No documents are available

Plans to Restore Water Quality

What plans are in place to protect or restore water quality?

Links below open in a new browser tab.

Plan	Impairments	Type	Completion Date
Sewickley Creek Watershed	Metals	TMDL	2009-02-02

Treatment Facility Summary		
Treatment Facility Name: Inorganics treatment plant		
WQM Permit No.	**Issuance Date**	**Purpose**
462I10	06/26/1962	Permit issued by Pennsylvania Dept. of Health - Sanitary Water Board to Westinghouse Electric Corporation for a system to treat metallic ions and acid wastes. Permit approved the following: raw water pumps; a 15,000-gallon equalization tank made of acid-resistant brick; a 600-gallon neutralization tank; a 6,000-gallon lime storage tank with transfer pump; a 50,000-gallon clarifier; two coagulant aid tanks with mixers; two 25 gpm sludge pumps; one 7,700-gallon sludge thickener with mixer; and one rotary vacuum filter. Issuance contingent on future installation of a biological system to remove organics.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Industrial	Primary	Equalization; neutralization; clarification	None	0.2083 (Design Avg.)

Treatment Facility Summary		
Treatment Facility Name: Organics treatment plant		
WQM Permit No.	**Issuance Date**	**Purpose**
465I20	02/23/1966	Permit issued by Pennsylvania Dept. of Health - Sanitary Water Board to Westinghouse Electric Corporation for an extended aeration system to treat organics (BOD and COD in sewage and industrial wastes). Permit approved the following: comminutor for sanitary waste; wet well; a biological treatment system composed of one circular tank with outer aeration, aerobic digestion, and disinfection zones and an inner clarification zone
465I20 T-1	07/28/1988	Permit transferred from Westinghouse Electric Corporation to Powerex, Inc.
465I20 T-1 A-1	06/22/1989	Permit issued to Powerex, Inc. for calcium chloride addition to the neutralization tank to precipitate calcium fluoride in the clarifier (to address fluoride effluent violations); two sludge pumps (1 operating and 1 backup) to recycle sludge to the neutralization tank; two sludge pumps (1 operating and 1 backup) to transfer sludge from the thickener to the filter press; and a new filter press for sludge dewatering
465I20 T-1 A-2	12/11/1998	Permit issued to Powerex, Inc. to replace acid-resistant brick equalization tank in the inorganics treatment plant with 11'-6" diameter, 18' high single-walled fiber-reinforced plastic tank
465I20 A-3	10/19/1999	Permit issued to Powerex, Inc. to replace the polyethylene equalization tank in the inorganics treatment plant with three fiberglass equalization tanks (two 425-gal. and one 325-gal.); also approved sewer line replacement to wastewater treatment plant (8" diameter FRP pipe encased in 12" diameter FRP pipe) and new 2" dia. PVC pipe from equalization tanks to the neutralization tank

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage and Industrial	Secondary	Extended aeration; aerobic digestion; clarification; disinfection	Chlorine	0.2685 (Design Avg.)

Comments: The three amendments to WQM Permit 465I20 should have been amendments to WQM Permit 462I10 because they authorized modifications to the inorganics treatment plant for industrial waste and not to the organics treatment plant for combined sewage and industrial waste. Also, WQM Permit 462I10 seemingly was never transferred from Westinghouse to Powerex even though it authorizes treatment systems still used by Powerex.

Compliance History

DMR Data for Outfall 001 (from February 1, 2024 to January 31, 2025)

Parameter	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24
Flow (MGD) Average Monthly	0.0416	0.0341	0.0532	0.0559	0.0506	0.0619	0.0499	0.0537	0.0532	0.0579	0.0601	0.0634
Flow (MGD) Daily Maximum	0.072	0.0649	0.0773	0.0818	0.0822	0.0821	0.0795	0.0782	0.0928	0.1268	0.0796	0.098
pH (S.U.) Daily Minimum	7.0	6.2	6.4	6.4	6.3	6.7	6.4	6.1	6.8	7.2	7.4	7.3
pH (S.U.) Daily Maximum	7.9	7.1	7.1	7.2	7.9	7.9	7.4	7.3	7.7	7.8	7.8	7.5
DO (mg/L) Daily Minimum	18.0	18.3	18.4	18.8	17.9	17.7	17.3	18.0	14.5	17.2	17.4	18.5
TRC (mg/L) Average Monthly	0.41	0.282	0.298	0.402	0.33	0.375	0.375	0.367	0.233	0.476	0.48	0.463
TRC (mg/L) Daily Maximum	0.64	1.25	0.65	0.62	0.65	0.65	0.61	0.85	0.70	0.70	0.87	1.03
CBOD5 (mg/L) Average Monthly	11.186	3.34	11.7	3.722	4.218	5.33	3.21	2.53	5.28	2.39	2.87	3.1
CBOD5 (mg/L) Daily Maximum	> 40.2	6.86	> 40.8	6.83	5.39	7.13	6.09	2.87	8.89	3.34	5.47	6.39
TSS (mg/L) Average Monthly	8.2	6.5	10.25	7.0	5.25	5.0	7.2	12.25	7.2	5.0	9.25	5.25
TSS (mg/L) Daily Maximum	12.0	11.0	24.0	15.0	6.0	5.0	10.0	18.0	12.0	5.0	22.0	6.0
Fecal Coliform (No./100 ml) Geometric Mean	1078.9	1050.72	32.55	3.64	9.51	1.41	2.402	3.6	68.09	94.47	152.58	277.67
Fecal Coliform (No./100 ml) Instantaneous Maximum	> 12100	> 2420	1300	16	66	4	8	56	162	361	365	687
Total Nitrogen (mg/L) Daily Maximum	13.1	20.3	18.0	14.0	4.95	11.7	20.4	13.2	12.4	9.8	9.46	10.7
Ammonia (mg/L) Average Monthly	5.184	0.831	0.381	0.181	0.103	0.175	0.342	0.193	4.51	6.19	5.21	6.75
Ammonia (mg/L) Daily Maximum	8.55	1.86	0.72	0.316	0.11	< 0.400	< 0.400	0.447	9.9	6.94	7.54	7.56
Total Phosphorus (mg/L) Daily Maximum	0.731	0.618	1.36	0.565	0.768	0.506	1.3	0.88	0.500	0.91	0.77	0.54
Total Aluminum (mg/L) Daily Maximum		1.41			1.78			0.508			0.821	

Parameter	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24
Total Iron (mg/L) Daily Maximum		0.177			0.232			0.242			0.319	
Total Manganese (mg/L) Daily Maximum		0.020			0.032			0.088			0.108	

DMR Data for Outfall 002 (from February 1, 2024 to January 31, 2025)

Parameter	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24
pH (S.U.) Daily Maximum		7.05						7.72				
TSS (mg/L) Daily Maximum		4.0						11.0				
Oil and Grease (mg/L) Daily Maximum		< 5.0						< 5.0				
Total Aluminum (mg/L) Daily Maximum		0.0938						0.915				
Total Iron (mg/L) Daily Maximum		0.288						1.27				
Total Manganese (mg/L) Daily Maximum		0.15						0.0571				

DMR Data for Internal Monitoring Point 101 (from February 1, 2024 to January 31, 2025)

Parameter	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24
Flow (MGD) Average Monthly	0.0323	0.0241	0.0407	0.0433	0.0395	0.0500	0.0395	0.0407	0.0352	0.0387	0.0409	0.0437
Flow (MGD) Daily Maximum	0.0593	0.0529	0.0639	0.0653	0.0702	0.0693	0.0665	0.0657	0.0613	0.0649	0.0596	0.0621
pH (S.U.) Daily Minimum	7.2	7.1	7.3	7.4	7.1	7.1	6.6	8.1	6.7	7.4	8.1	6.9
pH (S.U.) Daily Maximum	8.9	8.7	8.9	8.1	7.8	7.7	8.9	8.6	7.7	8.0	8.9	8.1
TSS (mg/L) Average Monthly	14.2	9	14.5	12	13.5	7	7.8	17	10.6	16.25	10.75	11.75
TSS (mg/L) Daily Maximum	23	14	21	19	25	9	12	26	20.0	21.0	21	14.0
Oil and Grease (mg/L) Average Monthly	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5	< 5	< 5.0	6.03	< 5.0	< 5.0
Oil and Grease (mg/L) Daily Maximum	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5	< 5	< 5.0	9.1	< 5.0	< 5.0
Total Cadmium (mg/L) Average Quarterly		< 0.0050			< 0.0050			< 0.0050			< 0.0050	

Parameter	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24
Total Cadmium (mg/L) Daily Maximum		< 0.005			< 0.005			< 0.005			< 0.005	
Total Chromium (mg/L) Average Quarterly		< 0.005			< 0.005			< 0.005			< 0.005	
Total Chromium (mg/L) Daily Maximum		< 0.005			< 0.005			< 0.005			< 0.005	
Total Copper (mg/L) Average Quarterly		< 0.005			< 0.005			< 0.005			< 0.005	
Total Copper (mg/L) Daily Maximum		< 0.005			< 0.005			< 0.005			< 0.005	
Total Cyanide (mg/L) Average Quarterly		0.0065			0.0075			0.006			0.0065	
Total Cyanide (mg/L) Daily Maximum		0.008			0.01			0.006			0.008	
Fluoride (mg/L) Average Monthly	11.844	9.48	8.638	6.962	7.513	8.31	11.28	13.68	10.97	9.94	12.26	9.66
Fluoride (mg/L) Daily Maximum	14.7	12.1	15.3	9.58	9.37	10.1	14.2	26.0	13.6	13.8	15.1	12.2
Total Lead (mg/L) Average Quarterly		< 0.005			< 0.005			< 0.005			< 0.005	
Total Lead (mg/L) Daily Maximum		< 0.005			< 0.005			< 0.005			< 0.005	
Total Nickel (mg/L) Average Quarterly		< 0.005			0.0055			0.005			0.007	
Total Nickel (mg/L) Daily Maximum		< 0.005			0.006			0.005			0.009	
Total Silver (mg/L) Average Quarterly		0.0006			< 0.0000619			< 0.0000619			0.0005	
Total Silver (mg/L) Daily Maximum		0.0008			< 0.0000619			< 0.0000619			< 0.001	
Total Zinc (mg/L) Average Quarterly		0.010			< 0.010			< 0.010			< 0.010	
Total Zinc (mg/L) Daily Maximum		0.010			< 0.010			< 0.010			< 0.010	
Total Toxic Organics (mg/L) Daily Maximum		0.020			0.0025			0.0271			0.026	
Trichloroethylene (mg/L) Annual Average		< 0.001										
Trichloroethylene (mg/L) Daily Maximum		< 0.001										

Compliance History

Effluent Violations for Outfall 001, from: March 1, 2024 To: January 31, 2025

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
CBOD5	11/30/24	Daily Max	> 40.8	mg/L	40.0	mg/L
CBOD5	01/31/25	Daily Max	> 40.2	mg/L	40.0	mg/L
Fecal Coliform	12/31/24	IMAX	> 2420	No./100 ml	10000	No./100 ml
Fecal Coliform	01/31/25	IMAX	> 12100	No./100 ml	10000	No./100 ml
Ammonia	05/31/24	Avg Mo	4.51	mg/L	3.0	mg/L
Ammonia	05/31/24	Daily Max	9.9	mg/L	6.0	mg/L

Summary of Inspections:

Other Comments:

Development of Effluent Limitations

IMP No. 101 **Design Flow (MGD)** 0.034 (avg.); 0.073 (max)
Latitude 40° 09' 50" **Longitude** -79° 52' 59"
Wastewater Description: Process wastewaters from semi-conductor manufacturing (plating, etching, cleaning, and rinsing)

Internal Waste Streams

Effluent limits are imposed at IMP 101 rather than another monitoring location because 40 CFR § 125.3(f) prohibits compliance with technology-based treatment requirements using "non-treatment" techniques such as flow augmentation (*i.e.*, dilution). Since the wastewaters monitored at IMP 101 combine with other wastewaters before the next downstream monitoring location (Outfall 001), IMP 101 is the only point at which compliance with applicable effluent limits can be determined without the interference of other wastewaters. This rationale is consistent with 40 CFR § 122.45(h)[1], which allows for the imposition of effluent limitations on internal waste streams in these circumstances.

Current Effluent Limits and Monitoring Requirements

Discharges regulated at IMP 101 are currently subject to the following effluent limits and monitoring requirements.

Table 1. IMP 101's Current Effluent Limits and Monitoring Requirements

Parameter	Concentration (mg/L)			Measurement Frequency	Sample Type	Limit Basis
	Average Quarterly	Maximum Daily	IMAX			
Flow (MGD)	Report Avg. Mo.	Report	—	Continuous	Metered	25 Pa. Code § 92.61(d)(1)
pH (S.U.)	6.0 Daily Min	9.0	—	1/week	Grab	40 CFR § 469.14
TSS	31.0 Avg. Mo.	60.0	—	1/week	24-Hr Comp.	40 CFR § 433.13(a)
Oil and Grease	15.0 Avg. Mo.	30.0	—	1/week	Grab	25 Pa. Code Chapter 95.2(2)
Cadmium, Total	0.0063	0.013	—	2/quarter	24-Hr Comp.	BPJ TBELs; 25 Pa. Code § 92.48†
Chromium, Total	1.59	2.77	—	2/quarter	24-Hr Comp.	40 CFR § 433.14(a)
Copper, Total	0.175	0.35	—	2/quarter	24-Hr Comp.	BPJ TBELs; 25 Pa. Code § 92.48†
Cyanide, Total	0.65	1.2	—	2/quarter	24-Hr Comp.	40 CFR § 433.14(a)
Fluoride, Total	16.6	32.0	—	1/week	24-Hr Comp.	40 CFR § 122.44(l) (Avg); 40 CFR § 469.15 (Max)l
Lead, Total	0.022	0.044	—	2/quarter	24-Hr Comp.	BPJ TBELs; 25 Pa. Code § 92.48†
Nickel, Total	0.55	1.1	—	2/quarter	24-Hr Comp.	BPJ TBELs; 25 Pa. Code § 92.48†
Silver, Total	0.0015	0.003	—	2/quarter	24-Hr Comp.	BPJ TBELs; 25 Pa. Code § 92.48†
Zinc, Total	0.277	0.554	—	2/quarter	24-Hr Comp.	BPJ TBELs; 25 Pa. Code § 92.48†
Total Toxic Organics	—	1.37	—	1/quarter	Grab	40 CFR § 469.15
Trichloroethylene	0.162	0.324	—	2/year	Grab	BPJ TBELs; 25 Pa. Code § 92.48†

† Limits originally imposed as WQBELs and subsequently maintained as case-by-case TBELs pursuant to DEP's Best Professional Judgement (BPJ) under 25 Pa. Code § 92a.48(a)(3).

The effluent limits and monitoring requirements in **Table 1** will remain in effect in the renewed permit pursuant to anti-backsliding requirements under Section 402(o) of the Clean Water Act (33 U.S.C. §1342(o)) and/or 40 CFR § 122.44(l) (incorporated by reference at 25 Pa. Code § 92a.44) unless the limits are superseded by more stringent limits developed for this renewal or are relaxed pursuant to the anti-backsliding exceptions listed in 33 U.S.C. §1342(o) or 40 CFR § 122.44(l).[2]

[1] 40 CFR § 122.45(h)(1): "When permit effluent limitations or standards imposed at the point of discharge are impractical or infeasible, effluent limitations or standards for discharges of pollutants may be imposed on internal waste streams before mixing with other waste streams or cooling water streams."

[2] 40 CFR § 122.44(l) *Reissued permits.* (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under § 122.62.)

101.A. Technology-Based Effluent Limitations (TBELs)

Federal Effluent Limitations Guidelines ("ELGs")

Treated process wastewaters from Powerex's semi-conductor manufacturing operations were previously subject to both the Metal Finishing Point Source Category, Subpart A – Metal Finishing Subcategory (40 CFR Part 433) and the Electrical and Electronic Components Point Source Category, Subpart A – Semiconductor Subcategory (40 CFR Part 469). As Powerex's NPDES permit was renewed over the years, the TBELs imposed at IMP 101 generally shifted to WQBELs rather than TBELs from the Federal ELGs. The WQBELs were imposed in Powerex's NPDES permit at various times in the past and were maintained as TBELs in consecutive NPDES permit renewals based on DEP's Best Professional Judgement (BPJ).

The Metal Finishing ELGs were applied to Powerex's industrial wastewaters based on Powerex's use of plating and etching processes, which are activities listed in the applicability description for the Metal Finishing Subcategory (40 CFR § 433.10(a)). 40 CFR §§ 433.13(a) and 433.14(a) impose the following effluent limits:

Table 2. 40 CFR Part 433, Subpart A – Metal Finishing Point Source Category BPT and BAT Effluent Limits

Pollutant or pollutant property	Maximum for any 1 day (mg/L)	Monthly average shall not exceed (mg/L)	Regulatory Reference
Cadmium, Total	0.69	0.26	§§ 433.13(a) & 433.14(a) (BPT & BAT)
Chromium, Total	2.77	1.71	§§ 433.13(a) & 433.14(a) (BPT & BAT)
Copper, Total	3.38	2.07	§§ 433.13(a) & 433.14(a) (BPT & BAT)
Lead, Total	0.69	0.43	§§ 433.13(a) & 433.14(a) (BPT & BAT)
Nickel, Total	3.98	2.38	§§ 433.13(a) & 433.14(a) (BPT & BAT)
Silver, Total	0.43	0.24	§§ 433.13(a) & 433.14(a) (BPT & BAT)
Zinc, Total	2.61	1.48	§§ 433.13(a) & 433.14(a) (BPT & BAT)
Cyanide, Total	1.20	0.65	§§ 433.13(a) & 433.14(a) (BPT & BAT)
TTO	2.13	—	§§ 433.13(a) & 433.14(a) (BPT & BAT)
Oil and Grease	52	26	§§ 433.13(a) (BPT)
TSS	60	31	§§ 433.13(a) (BPT)
pH	within the range of 6.0 to 9.0		§§ 433.13(a) (BPT)

The Semiconductor Subcategory of the Electrical and Electronic Components ELGs at 40 CFR §§ 469.14 and 469.15 impose the following effluent limits:

Table 3. 40 CFR Part 469, Subpart A – Semiconductor Subcategory BPT and BAT Effluent Limits

Pollutant or pollutant property	Maximum for any 1 day (mg/L)	Average of daily values for 30 consecutive days (mg/L)	Regulatory Reference
TTO (Total Toxic Organics)	1.37	N/A	§§ 469.14 & 469.15 (BPT & BAT)
Fluoride, Total	32.0	17.4	§ 469.15 (BAT)
pH	within the range of 6.0 to 9.0		§ 469.14 (BPT)

With respect to applicability, § 433.10(b) states that:

> In some cases effluent limitations and standards for the following industrial categories may be effective and applicable to wastewater discharges from the metal finishing operations listed above. In such cases these part 433 limits shall not apply and the following regulations shall apply: […]
>
> Electrical and electronic components (40 CFR part 469)

DEP previously determined that it was appropriate to impose the limits on metals from Part 433 due to the presence of metals in Powerex's industrial wastewaters resulting from plating and etching operations. As explained in the treatment facility section of this Fact Sheet, Powerex initially installed a treatment system to remove metallic ions and to neutralize acids in the wastewaters from its manufacturing operations. A few years later Powerex installed a combined sewage-industrial waste treatment system to remove BOD and COD from its sanitary and industrial wastewaters. Part 469 specifically omits TBELs for copper, chromium, lead, and nickel from plating and etching operations because Part 433 regulates those pollutants and activities.

Ultimately, DEP imposed effluent limits for Total Toxics Organics ("TTO") from Subpart A of 40 CFR Part 469 and a combination of TBELs from 40 CFR Part 433, Subpart A, and WQBELs maintained from previous permits based on DEP's BPJ and anti-backsliding requirements. The current limits, the bases for those limits, and when they were first imposed are summarized in the table below.

Table 4. Current IMP 101 Effluent Limits

Parameter	Average Monthly (mg/L)	Maximum Daily (mg/L)	Basis
Total Suspended Solids	31.0	60.0	40 CFR § 433.13(a) (1996 Permit)
Oil and Grease	15.0	30.0	25 Pa. Code § 95.2(2) (1996 Permit)
Fluoride, Total	16.6	32.0	WQBEL (Avg. Mo., 2002 Permit)[3] 40 CFR § 469.15 (Max Daily, 2020 Permit)
Cadmium, Total	0.0063	0.013	WQBELs (2007 Permit)
Chromium, Total	1.59	2.77	WQBEL (Avg. Mo., 1991 Permit) and 40 CFR § 433.14(a) (Max Daily, 2002 Permit)
Copper, Total	0.175	0.35	WQBELs (1992 Permit Amendment to update stream hardness and hardness-based WQBELs)
Cyanide, Total	0.65	1.2	40 CFR § 433.14(a) (1996 Permit)
Lead, Total	0.022	0.044	WQBELs (1991 Permit)
Nickel, Total	0.55	1.1	WQBELs (1985 Permit)
Silver, Total	0.0015	0.003	WQBELs (1991 Permit)
Zinc, Total	0.277	0.554	WQBELs (1991 Permit)
Total Toxic Organics (TTO)	—	1.37	40 CFR § 469.15 (1985 Permit)
Trichloroethylene	0.162	0.324	WQBELs (2002 Permit)

Sample analyses of influent wastewaters to the inorganics treatment system suggest that Powerex complies with most of the limits because the pollutant concentrations in the raw wastewaters are already less than the limits. DEP does not have enough influent data to conclude that this is always the case so the limits in Table 4 will be maintained in the renewed permit pursuant to anti-backsliding.

101.B. Water Quality-Based Effluent Limitations (WQBELs)

WQBELs generally are not imposed at internal monitoring points because internal waste streams do not need to comply with water quality standards until they discharge to waters of the Commonwealth. However, WQBELs for toxic pollutants such as trichloroethylene were calculated based on water quality analyses at Outfall 001 and the resulting limits were then imposed at IMP 101. This was done because toxics are not present in either the sanitary wastewaters or the cooling waters that discharge through Outfall 001, so WQBELs for toxics were calculated from WQBELs developed at Outfall 001 and imposed on the semi-conductor manufacturing wastewaters that contain toxics. No new WQBELs will be calculated for IMP 101. However, WQBELs will be evaluated at Outfall 001 for the combined discharge of sewage, industrial waste, and cooling water.

101.C. Effluent Limitations and Monitoring Requirements for Internal Monitoring Point 101

In accordance with 25 Pa. Code §§ 92a.12 and 92a.61, 40 CFR § 122.45(h) regarding the regulation of internal waste streams, and anti-backsliding requirements under either 33 U.S.C. 1342(o) or 40 CFR § 122.44(l), effluent limits at IMP 101 are the more stringent of TBELs, WQBELs, regulatory effluent standards, and monitoring requirements developed for this permit renewal; and effluent limits and monitoring requirements from the previous permit subject to any exceptions to anti-backsliding discussed previously in this Fact Sheet. Applicable effluent requirements are summarized in the table below.

[3] The existing fluoride WQBELs were calculated based on fish criteria that have since been removed from 25 Pa. Code § 93.7. Even though fluoride fish criteria are no longer considered, Powerex conducted a Toxics Reduction Evaluation ("TRE") to comply with the fluoride WQBELs imposed in the 2002 NPDES permit. The TRE included a fluoride treatability study that recommended changes to treatment operations including the addition of calcium chloride and alum in conjunction with existing lime addition to enhance fluoride removal through fluoride precipitation (as calcium fluoride) and coagulation. Since Powerex's compliance with the existing fluoride WQBELs is driven by the effectiveness of Powerex's inorganics treatment plant (as refined through the TRE process), the fluoride WQBELs are retained as TBELs (*i.e.*, limits that are achievable by the treatment technologies employed) pursuant to USEPA's anti-backsliding requirements (33 U.S.C. §1342(o)). The maximum daily TBEL for fluoride from 40 CFR Part 469 supersedes the fluoride maximum daily WQBEL imposed previously.

Table 5. Effluent Limits and Monitoring Requirements for IMP 101

Pollutant	Mass (pounds/day)		Concentration (mg/L)			Basis
	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily	IMAX	
Flow (MGD)	Report	Report	—	—	—	25 Pa. Code §92a.61(d)(1)
Total Suspended Solids	—	—	31.0	60.0	—	40 CFR §§ 122.44(l) & 433.13(a)
Oil and Grease	—	—	15.0	30.0	—	33 U.S.C. §1342(o); 25 Pa. Code § 95.2(2)
Fluoride, Total	—	—	16.6	32.0	—	33 U.S.C. §1342(o); 40 CFR & 469.15
Cadmium, Total	—	—	0.0063	0.013	—	33 U.S.C. §1342(o); BPJ TBEL
Chromium, Total	—	—	1.59	2.77	—	40 CFR §§ 122.44(l) 433.14(a); BPJ TBEL
Copper, Total	—	—	0.175	0.35	—	33 U.S.C. §1342(o); BPJ TBEL
Cyanide, Total	—	—	0.65	1.2	—	40 CFR §§ 122.44(l) & 433.14(a)
Lead, Total	—	—	0.022	0.044	—	33 U.S.C. §1342(o); BPJ TBEL
Nickel, Total	—	—	0.55	1.1	—	33 U.S.C. §1342(o); BPJ TBEL
Silver, Total	—	—	0.0015	0.003	—	33 U.S.C. §1342(o); BPJ TBEL
Zinc, Total	—	—	0.277	0.554	—	33 U.S.C. §1342(o); BPJ TBEL
Total Toxic Organics (TTO)	—	—	—	1.37	—	40 CFR § 469.15
Trichloroethylene	—	—	0.162	0.324	—	33 U.S.C. §1342(o); BPJ TBEL
pH	within the range of 6.0 to 9.0					40 CFR § 469.14

Existing monitoring frequencies and sample types will be maintained in the renewed permit including: 24-hour composite sampling 2/quarter for cadmium, chromium, copper, cyanide, lead, nickel, silver, and zinc; 1/quarter grab sampling for Total Toxic Organics; 1/week grab sampling for oil and grease and pH; 24-hour composite sampling 1/week for total suspended solids and fluoride; 2/year grab sampling for trichloroethylene; and continuous flow monitoring.

The average limits for cadmium, chromium, copper, cyanide, lead, nickel, silver, zinc, and TTO are statistically-derived average monthly limits, but those average monthly limits will be identified in the permit and in the Department's electronic Discharge Monitoring Report system as "Average Quarterly" and "Average Yearly" limits. This is done because the Department's eDMR system cannot reconcile average monthly limits with sampling frequencies longer than a month (*e.g.*, an average monthly limit with quarterly sampling). However, samples collected 2/quarter and 2/year must be collected during the same calendar month because limits are necessarily expressed as average monthly limits pursuant to 40 CFR § 122.45(d) (see below). Permittees must demonstrate compliance with those limits based on samples collected during a calendar month so that the analytical results are consistent with the statistical bases for the limits.

40 CFR § 122.45(d) states:

> *(d) Continuous discharges*. For continuous discharges all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards, shall unless impracticable be stated as:
>
> (1) Maximum daily and average monthly discharge limitations for all dischargers other than publicly owned treatment works; and […]

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.048 (avg.); 0.076 (max)
Latitude 40° 13' 50.00" **Longitude** -79° 34' 6.00"
Wastewater Description: Treated process wastewaters; treated sanitary wastewaters; and non-contact cooling water

Current Effluent Limits and Monitoring Requirements

Discharges regulated at Outfall 001 are currently subject to the following effluent limits and monitoring requirements.

Table 6. Outfall 001's Current Effluent Limits and Monitoring Requirements

Parameter	Concentration (mg/L)			Measurement Frequency	Sample Type	Limit Basis
	Average Monthly	Maximum Daily	IMAX			
Flow (MGD)	Report	Report	—	1/day	Metered	25 Pa. Code § 92.61(d)(1)
pH (S.U.)	6.0 Daily Min	9.0	—	Daily when Discharging	Grab	25 Pa. Code § 92a.47(a)(7)
Dissolved Oxygen	4.0 Daily Min	—	—	Daily when Discharging	Grab	33 U.S.C. § 1342(o); 25 Pa. Code § 92a.48(a)(3)
Total Residual Chlorine	0.5	1.25	—	Daily when Discharging	Grab	25 Pa. Code § 92a.47(a)(8)
CBOD5 Nov 1 – Apr 30	20.0	40.0	—	1/week	24-Hr Comp.	WQBELs; 33 U.S.C. § 1342(o)
CBDO5 May 1 – Oct 31	10.0	20.0	—	1/week	24-Hr Comp.	WQBELs; 33 U.S.C. § 1342(o)
Total Suspended Solids	30.0	60.0	—	1/week	24-Hr Comp.	25 Pa. Code § 92a.47(a)(1)
Fecal Coliform (No.100 mL) Oct 1 – Apr 30	2000	—	10,000	1/week	Grab	25 Pa. Code § 92a.47(a)(4)
Fecal Coliform (No./100 mL) May 1 – Sept 30	200	—	1,000	1/week	Grab	25 Pa. Code § 92a.47(a)(5)
Nitrogen, Total	16.6	32.0	—	1/month	Grab	25 Pa. Code § 92a.61(b)
Ammonia-Nitrogen Nov 1 – Apr 30	9.0	18.0	—	1/week	24-Hr Comp.	WQBELs; 33 U.S.C. § 1342(o)
Ammonia-Nitrogen May 1 – Oct 31	3.0	6.0	—	1/week	24-Hr Comp.	WQBELs; 33 U.S.C. § 1342(o)
Phosphorus, Total	—	Report	—	1/month	Grab	25 Pa. Code § 92a.61(b)
Aluminum, Total	—	Report	—	1/quarter	Grab	25 Pa. Code § 92a.61(b)
Iron, Total	—	Report	—	1/quarter	Grab	25 Pa. Code § 92a.61(b)
Manganese, Total	—	Report	—	1/quarter	Grab	25 Pa. Code § 92a.61(b)

† Limits originally imposed as WQBELs and subsequently maintained as case-by-case TBELs pursuant to DEP's Best Professional Judgement (BPJ) under 25 Pa. Code § 92a.48(a)(3).

The effluent limits and monitoring requirements in **Table 6** will remain in effect in the renewed permit pursuant to anti-backsliding requirements under Section 402(o) of the Clean Water Act (33 U.S.C. §1342(o)) and/or 40 CFR § 122.44(l) (incorporated by reference at 25 Pa. Code § 92a.44) unless the limits are superseded by more stringent limits developed for this renewal or are relaxed pursuant to the anti-backsliding exceptions listed in 33 U.S.C. §1342(o) or 40 CFR § 122.44(l).

001.A. Technology-Based Effluent Limitations (TBELs)

25 Pa. Code § 92a.47 – Sewage Permits

Regulations at 25 Pa. Code § 92a.47 specify TBELs and effluent standards that apply to sewage discharges. Section 92a.47(a) requires that sewage be given a minimum of secondary treatment with significant biological treatment that achieves the following:

Table 7. TBELs for Sewage Discharges

Parameter	Monthly Average (mg/L)	Instant Maximum (mg/L)	Basis
Total Suspended Solids	30	60†	25 Pa. Code § 92a.47(a)(1)
$CBOD_5$	25	50†	25 Pa. Code § 92a.47(a)(1)
Fecal Coliform (No./100 mL) May 1 – September 30	200 (Geometric Mean)	1,000	25 Pa. Code § 92a.47(a)(4)
Fecal Coliform (No./100 mL) October 1 – April 30	2,000 (Geometric Mean)	10,000	25 Pa. Code § 92a.47(a)(5)
Total Residual Chlorine	0.5 (or facility-specific)	1.6 (or facility-specific)	25 Pa. Code § 92a.47(a)(8)
pH (s.u.)	not less than 6.0 and not greater than 9.0		25 Pa. Code § 92a.47(a)(7)

†Value is calculated as two times the monthly average in accordance with Chapter 2 of DEP's Technical Guidance for the Development and Specification of Effluent Limitations

The TBELs for $CBOD_5$, TSS, and pH are the same as those specified in USEPA's secondary treatment regulation (40 CFR § 133.102). DEP previously imposed an instantaneous maximum limit of 1.25 mg/L for total residual chlorine. That limit will be maintained based on anti-backsliding.

Other Effluent Limits and Monitoring Requirements

DEP has identified four additional pollutants of concern for discharges of treated sewage: ammonia-nitrogen, dissolved oxygen, total nitrogen, and total phosphorus.

Pursuant to DEP's "Implementation Guidance of Section 93.7 Ammonia Criteria" [Document No. 386-2000-022], ammonia-nitrogen limits of 25 mg/L average monthly and 50 mg/L instantaneous maximum are achievable using secondary treatment. DEP's policy for imposing ammonia-nitrogen TBELs depends on a water quality analysis, which considers both ammonia-nitrogen limits and $CBOD_5$ limits relative to achieving minimum dissolved oxygen criteria. DEP's WQM 7.0 water quality modeling program uses a balanced technology approach to control $CBOD_5$ and ammonia-nitrogen incorporating two factors: 1) the relative economics of removal whereby the removal of ammonia, beyond that needed for toxicity, is avoided until further $CBOD_5$ removal becomes prohibitively expensive (because it is more expensive to remove ammonia than to remove carbonaceous BOD); and 2) while each mg/L of ammonia-nitrogen ultimately consumes 4.57 mg/L of oxygen ($CBOD_5$ ultimately consumes only 1.5 mg/L), it consumes it at a slower rate, and thus does not impact the point of minimum dissolved oxygen as directly as the stoichiometrically based values would indicate. The water quality analysis for Outfall 001 is discussed in Section 001.B of this Fact Sheet.

A minimum dissolved oxygen limit of 4.0 mg/L is imposed as a case-by-case TBEL pursuant to 25 Pa. Code § 92a.48(a)(3), 40 CFR § 125.3, and DEP's Best Professional Judgement. A dissolved oxygen concentration of 4.0 mg/L is achievable by properly operated and maintained extended aeration systems like Powerex's existing organics treatment plant. Powerex's organics treatment plant also is overdesigned for the amount of organic loading the system currently receives. At the time the system was installed, the design flows and organic influent loading for the organics treatment system were as follows:

Table 8. Design Specifications for the Organics Treatment System

Flow Design Basis	**Industrial Waste**	**Sewage**	**Combined**
Average Flow (gpd)	216,000	52,500	268,500
Average Flow (gpm)	150	36.5	186.5
Peak Daily Flow (gpm)	175	54.7	229.7
Organic Loading Design Basis	**Industrial Waste**	**Sewage**	**Combined**
COD (mg/L)	2,760	82	3,842
COD (lbs/day)	1,530	187.5	1,717.5
BOD (mg/L)	1,836	55.8	1,891.8
BOD (lbs/day)	1,020	127.5	1,147.5

Based on the NPDES permit renewal application and Discharge Monitoring Report data, the average flow of industrial wastewater is approximately 34,000 gpd (about 24 gpm) and the average flow of sanitary wastewaters is 14,000 gpd (about 10 gpm). The influent BOD loading to the organics treatment system is 89.4 mg/L and 35.31 lbs/day and the influent COD

loading is 178 mg/L and 70.31 lbs/day. These flows and loadings are significantly less than the design flows and loadings of the system. Consequently, higher dissolved oxygen concentrations than 4.0 mg/L are achieved (17.7 mg/L on average).

Reporting requirements for Total Nitrogen and Total Phosphorus are imposed pursuant to 25 Pa. Code § 92a.61. The reporting requirements are established in all new and reissued permits approving sewage discharges with design flows greater than 2,000 gpd with the goal of monitoring nutrient loading to waters of the Commonwealth.

Per- and Polyfluoroalkyl Substances (PFAS)

In February 2024, DEP implemented a new monitoring initiative for PFAS. 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.[4] Due to their durability, toxicity, persistence, and pervasiveness, PFAS have emerged as 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.

In all cases a condition is included 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. Powerex reported results for PFOA, PFOS, HFPO-DA, and PFBS in the permit renewal application. The results are summarized in Table 9.

Table 9. Analytical Results for PFAS at Outfall 001

Parameter	Maximum Concentration (ng/L)	Permit Quantitation Limit (ng/L)
Perfluorooctanoic acid (PFOA)	<0.91	4.0
Prefluorooctanesulfonic acid (PFOS)	<0.85	3.7
Perfluorobutanesulfoni acid (PFBS)	<0.84	3.5
Hexafluoropropylene oxide dimer acid (HFPO-DA)	<0.91	6.4

Consistent with Section II.I.a of SOP No. BCW-PMT-032, the non-detect values for PFOA, PFOS, PFBS, and HFPO-DA mean that annual monitoring will be required for those parameters. 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 quarterly results in Powerex's case), then the monitoring may be discontinued.

[4] ATSDR, "Toxicological Profile for Perfluoroalkyls". Patrick N. Breysse, Ph.D., CIH Director, National Center for Environmental Health and Agency for Toxic Substances and Disease Registry Centers for Disease Control and Prevention, May 2021.

001.B. Water Quality-Based Effluent Limitations (WQBELs)

Water quality impacts resulting from Outfall 001's discharges will be evaluated in two parts: 1) an evaluation of toxic and non-conventional pollutants that originate from Powerex's industrial wastes (e.g., metals and toxic organics); and 2) an evaluation of WQBELs for $CBOD_5$, ammonia-nitrogen, and dissolved oxygen.

Toxics Management Spreadsheet Water Quality Modeling Program and Procedures for Evaluating Reasonable Potential

WQBELs are developed pursuant to Section 301(b)(1)(C) of the Clean Water Act and, per 40 CFR § 122.44(d)(1)(i), are imposed to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." The Department of Environmental Protection developed the DEP Toxics Management Spreadsheet (TMS) to facilitate calculations necessary to complete a reasonable potential (RP) analysis and determine WQBELs for discharges of toxic and some nonconventional pollutants.

The TMS is a single discharge, mass-balance water quality modeling program for Microsoft Excel® that considers mixing, first-order decay, and other factors to determine WQBELs for toxic and nonconventional pollutants. Required input data including stream code, river mile index, elevation, drainage area, discharge flow rate, low-flow yield, and the hardness and pH of both the discharge and the receiving stream are entered into the TMS to establish site-specific discharge conditions. Other data such as reach dimensions, partial mix factors, and the background concentrations of pollutants in the stream also may be entered to further characterize the discharge and receiving stream. The pollutants to be analyzed by the model are identified by inputting the maximum concentration reported in the permit application or Discharge Monitoring Reports, or by inputting an Average Monthly Effluent Concentration (AMEC) calculated using DEP's TOXCONC.xls spreadsheet for datasets of 10 or more effluent samples. Pollutants with no entered concentration data and pollutants for which numeric water quality criteria in 25 Pa. Code Chapter 93 have not been promulgated are excluded from the modeling. If warranted, ammonia-nitrogen, CBOD-5, and dissolved oxygen are analyzed separately using DEP's WQM 7.0 model.

The TMS evaluates each pollutant by computing a wasteload allocation for each applicable criterion, determining the most stringent governing WQBEL, and comparing that governing WQBEL to the input discharge concentration to determine whether permit requirements apply in accordance with the following RP thresholds:

- Establish limits in the permit where the maximum reported effluent concentration or calculated AMEC equals or exceeds 50% of the WQBEL. Use the average monthly, maximum daily, and instantaneous maximum (IMAX) limits for the permit as recommended by the TMS (or, if appropriate, use a multiplier of 2 times the average monthly limit for the maximum daily limit and 2.5 times the average monthly limit for IMAX).
- For non-conservative pollutants, establish monitoring requirements where the maximum reported effluent concentration or calculated AMEC is between 25% - 50% of the WQBEL.
- For conservative pollutants, establish monitoring requirements where the maximum reported effluent concentration or calculated AMEC is between 10% - 50% of the WQBEL.

In most cases, pollutants with effluent concentrations that are not detectable at the level of DEP's Target Quantitation Limits are eliminated as candidates for WQBELs and water quality-based monitoring requirements.

Reasonable Potential Analysis and WQBEL Development for Outfall 001

Discharges from Outfall 001 are evaluated based on the maximum concentrations reported on the permit renewal application or on DMRs. The TMS model is run for Outfall 001 with the modeled discharge and receiving stream characteristics shown in Table 10. Pollutants for which water quality criteria have not been promulgated (e.g., TSS, Oil and Grease, etc.) are excluded from the modeling.

The $Q_{7\text{-}10}$ flow of Sewickley Creek (1.46 cfs) at the point of discharge is estimated using USGS's StreamStats web application with an allowance for the application's 66% standard error [*i.e.*, 0.881 cfs + (0.881 × 0.66) cfs = 1.46 cfs]. The same allowance is given for the $Q_{7\text{-}10}$ at the modeled end-or-segment (1.64 cfs + 66% = 2.72). Elevations and slopes are derived from a USGS topographical map. The low-flow yield is calculated by dividing the $Q_{7\text{-}10}$ by the drainage area.

Table 10. TMS Inputs for Outfall 001

Discharge Characteristics		
Parameter	**Value**	
Discharge Flow (MGD)	0.048	
Hardness (mg/L)	100	
Receiving Stream Characteristics		
Parameter	**Outfall 001**	**End of Segment**
Stream Code	37556	37556
River Mile Index	20.4	19.61
Drainage Area (mi^2)	44.3	73.9
Q_{7-10} (cfs)	1.46	2.72
Low-flow Yield (cfs/mi^2)	0.0329	0.0368
Elevation (ft)	937	932
Slope (ft/ft)	0.0012	0.0012

The TMS model is conservatively run at a default stream hardness of 100 mg/L. Powerex previously provided hardness information for Sewickley Creek in 1992 (568 mg/L) and 2002 (620 mg/L). However, DEP does not have hardness data reflecting current conditions in Sewickley Creek.[5] That information would be necessary only if using a hardness of 100 mg/L results in new WQBELs for the metals with hardness-dependent criteria in Chapter 93 with lower stream hardness concentrations resulting in more stringent WQBELs.

Output from the TMS model is included in **Attachment A** to this Fact Sheet. As explained previously, the TMS compares the input discharge concentrations to the calculated WQBELs using DEP's Reasonable Potential thresholds to evaluate the need to impose WQBELs or monitoring requirements in the permit. The results of the modeling indicate that the water quality-based reporting requirements in Table 11 are needed for Outfall 001.

Table 11. Water Quality-Based Effluent Limits for Outfall 001

Parameter	**Permit Limits**					**Maximum Reported Result (µg/L)**	**Governing WQBEL**	**Target QL (µg/L)**
	Mass (lbs/day)		**Concentration (µg/L)**					
	Avg Mo.	**Max Daily**	**Avg Mo.**	**Max Daily**	**IMAX**			
Aluminum, Total	Report	Report	Report	Report	Report	2,700	9,916	10

NOTE: Aluminum does not have hardness-based water quality criteria.

Aluminum already requires quarterly reporting under the current permit, which would be continued based on anti-backsliding. However, Aluminum may be subject to different requirements due to the impairment of Sewickley Creek by acid mine drainage (see TMDL discussion below).

WQM 7.0 Water Quality Modeling Program

Pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020, new water quality criteria for ammonia-nitrogen apply to waters of the Commonwealth. Therefore, WQBELs for CBOD-5 and ammonia-nitrogen are re-evaluated even though there have been no changes to the STP's primary outfall.

WQM 7.0 is a water quality modeling program for Windows that determines Waste Load Allocations ("WLAs") and effluent limitations for carbonaceous biochemical oxygen demand ("CBOD5"), ammonia-nitrogen, and dissolved oxygen ("D.O.") for single and multiple point-source discharge scenarios. To accomplish this, the model simulates two basic processes. In the ammonia-nitrogen module, the model simulates the mixing and degradation of ammonia-nitrogen in the stream and compares calculated instream ammonia-nitrogen concentrations to ammonia-nitrogen water quality criteria. In the D.O. module, the model simulates the mixing and consumption of D.O. in the stream due to the degradation of CBOD5 and ammonia-nitrogen and compares calculated instream D.O. concentrations to D.O. 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.

Water Quality Modeling for Outfall 001 with WQM 7.0

The WQM 7.0 model is run for Outfall 001 to determine whether WQBELs are necessary for $CBOD_5$, ammonia-nitrogen, and D.O. Input values for the WQM 7.0 model are shown in Table 12.

DEP's modeling for sewage discharges is a two-step process. First, a discharge is modeled for the summer period (May through October) using warm temperatures for the discharge and the receiving stream. Modeling for the summer period is done first because allowable ammonia concentrations in a discharge are lower at higher temperatures (*i.e.*, warm

[5] The permit application has a prompt for applicants to report the total hardness of the receiving stream upstream of the process wastewater outfall (*i.e.*, the background hardness of the receiving stream unaffected by the effluent). However, Powerex reported the hardness of its wastewaters upstream of the discharge point.

temperatures are more likely to result in critical loading conditions). Reduced D.O. levels also appear to increase ammonia toxicity and the maximum concentration of D.O. in water is lower at higher temperatures.

Table 12. WQM 7.0 Modeling Inputs and Assumptions

Modeling Input Parameters				
Discharge Flow (MGD)	0.048			
Parameter	**Upstream Point (Outfall 001)**		**Downstream Point (End of Segment)**	
Stream Code	37556		37556	
River Mile Index	20.4		18.65	
Drainage Area (mi^2)	44.3		80	
Q_{7-10} (cfs)	1.46		1.8	
Elevation (ft)	938		926.6	
Slope (ft/ft)	0.0012		0.0012	
Width/Depth Ratio	3.5		3.5	
Low-flow yield (cfs/mi^2)	0.0329		0.0225	
Seasonal Input Parameters				
Parameter	**Summer**		**Winter**	
	Stream	**001**	**Stream**	**001**
Temperature (°C)	25	20	5	15
pH (S.U.)	7.0	7.2	7.0	7.0
D.O. (mg/L)	8.38	4.0	12.80	4.0
$CBOD_5$ (mg/L)	2.0	25.0	2.0	25.0
NH_3-N (mg/L)	0.0	25.0	0.0	25.0
D.O. Goal (mg/L)	5.0		5.0	

The second step is to evaluate WQBELs for the winter period, but only if modeling shows that WQBELs are needed for the summer period. For the summer period, pursuant to DEP's "Implementation Guidance of Section 93.7 Ammonia Criteria" [Doc. No. 391-2000-013] (Ammonia Guidance) and in the absence of site-specific data, the discharge temperature is assumed to be 20°C. The input discharge concentrations are the model's defaults: 25 mg/L for both CBOD5 and ammonia-nitrogen.

The Q_{7-10} flow of Sewickley Creek is estimated to be 1.46 cfs based on the Q_{7-10} calculated by USGS's StreamStats web application with an allowance for that application's 66% standard error [i.e., 0.881 cfs + (0.881 × 0.66) cfs ≈ 1.46]. Previously, DEP added the discharge flow rate of the Youngwood Borough STP (0.5 MGD when modeling for ammonia was last done in 1991) to the Q_{7-10} from USGS StreamStats because the discharge from the Youngwood Borough STP was located within the modeled downstream segment of Sewickley Creek and would be expected to be discharging at low-flow conditions. The Youngwood Borough STP ceased discharging in 2020 and its NPDES Permit (PA0024449) was terminated on December 2, 2020. Therefore, the Q_{7-10} is not adjusted to account for other discharges.

WQM 7.0 modeling results (see **Attachment B**) return the input discharge concentrations as the recommended limits, which means that new WQBELs do not apply for CBOD5 or ammonia-nitrogen. Therefore, no winter period modeling is performed. The previously imposed limits for CBOD-5 and Ammonia-Nitrogen will be maintained the renewed permit based on anti-backsliding.

Thermal Impacts for Heated Discharges (Non-Contact Cooling Water)

Discharges from Outfall 001 include a small proportion of non-contact cooling water. Even though that non-contact cooling water contains waste heat, that heat is not expected to have a significant impact on discharge temperatures at Outfall 001 because the cooling water passes through the organic wet well and mixes with industrial wastewater and sewage in the treatment plant, which allow residual heat to dissipate.

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.

Total Maximum Daily Load (TMDL) for the Sewickley Creek Watershed

Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency's Water Quality Planning and Management Regulations (40 CFR part 130) require states to develop a TMDL for impaired water bodies. A TMDL

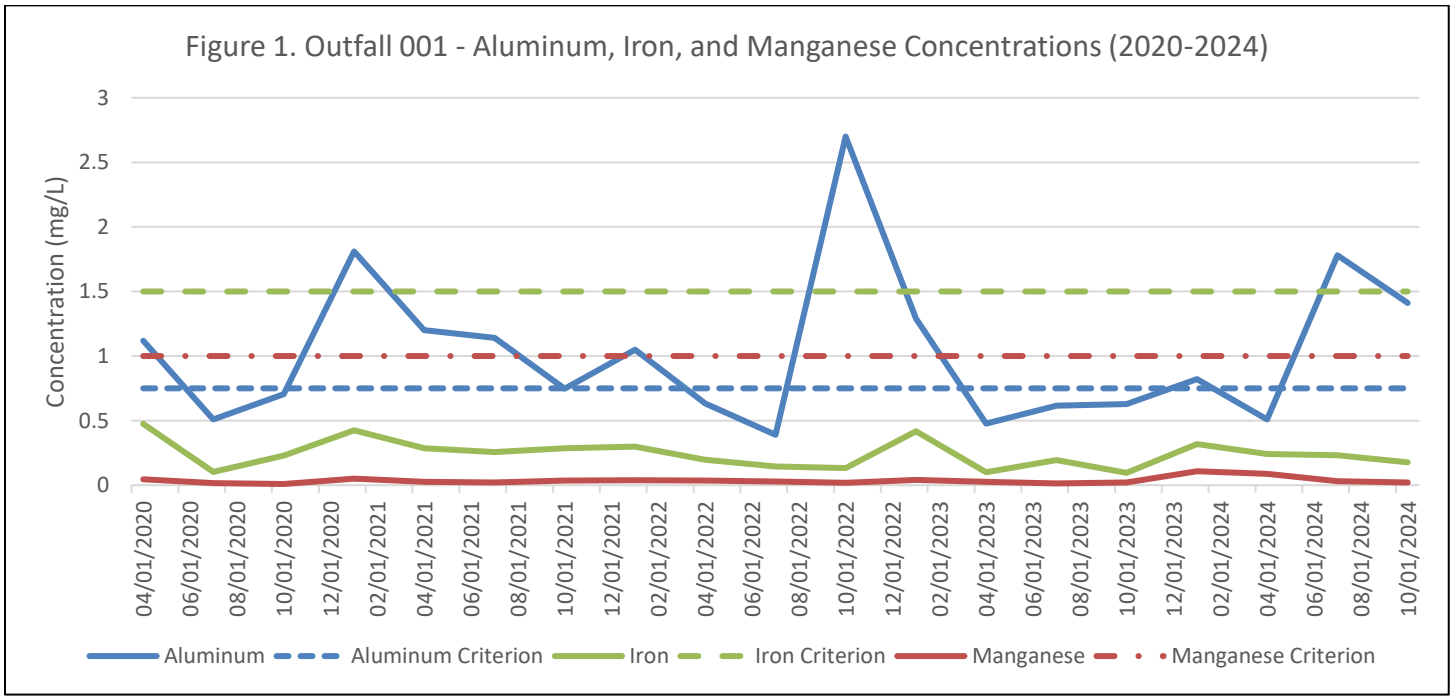
establishes the amount of a pollutant that a water body can assimilate without exceeding the water quality criteria for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and non-point sources to restore and maintain the quality of the state's water resources. A TMDL considers each river and tributary within the target watershed and its impairment sources. Stream data and discharger data are used to calculate minimum pollutant reductions that are necessary to attain water quality criteria. To achieve those reductions, the TMDL prescribes allocations to all contributing pollutant sources in the target watershed to minimally achieve water quality criteria (*i.e.*, 100% use of a stream's assimilative capacity).

TMDL allocations include waste load allocations (WLA), load allocations (LA), and a margin of safety (MOS). The WLA is the portion of the allowable load assigned to point sources. The LA is the portion of the allowable load assigned to non-point sources. The MOS is applied to account for uncertainties in the computational process and may be expressed implicitly (documenting conservative processes in the computations) or explicitly (setting aside a portion of the allowable load). Absent a TMDL revision, loads included in the MOS cannot be reallocated to either the WLA or LA portion of the TMDL.

The aquatic life uses of Sewickley Creek and tributaries to Sewickley Creek including Jacks Run, Welty Run, Buffalo Run, and their tributaries are impaired by metals (aluminum, iron, and manganese) and pH from acid mine drainage ("AMD"). On April 8, 2009, U.S. EPA approved a TMDL prepared by DEP addressing the AMD-based impairments in the watershed.

No WLAs were assigned to Powerex's discharges by the Sewickley Creek Watershed TMDL. In the previous permit, quarterly reporting was required for aluminum, iron, and manganese because 1) at the time, the data available for aluminum, iron, and manganese in Powerex's effluent were limited to three sets of analytical results collected over three weeks in April 2018, which did not permit an evaluation of the long-term variability of those metals in the effluent, and 2) based on the April 2018 data, aluminum, iron, and manganese did not exhibit a reasonable potential to cause or contribute to excursions above water quality criteria.

Based on quarterly effluent data reported under the permit, iron and manganese do not exhibit reasonable potential to cause or contribute to excursions above their respective water quality criteria. However, 55% of the results reported for aluminum exceed the most stringent water quality criterion for aluminum. The DMR results for those parameters and corresponding water quality criteria are summarized in Figure 1.



40 CFR § 122.44(d)(1)(vii)(B) requires that, when developing WQBELs, the permitting authority shall ensure that effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available WLA for the discharge prepared by the State and approved by EPA pursuant to 40 CFR § 130.7.

The Sewickley Creek TMDL sampling point nearest to Powerex is SC3 – Sewickley Creek downstream of Jacks Run, about three miles downstream of Outfall 001. The table below summarizes the TMDL for that section.

Parameter	Existing Load (lbs/day)	TMDL Allowable Load (lbs/day)	WLA (lbs/day)	LA (lbs/day)	NPS† Load Reduction (lbs/day)	NPS % Reduction
SC3 – Sewickley Creek downstream of Jacks Run						
Aluminum (lbs/day)	317.07	155.36	6.3	149.06	113.44	43%
Iron (lbs/day)	255.73	255.73	12.5	0.25	NA	NA
Manganese (lbs/day)	57.71	57.71	8.3	0.22	NA	NA
Acidity (lbs/day)	-74418.25	-74418.25	-	-74418.25	NA	NA

† NPS = non-point source

As the table shows, no reductions in iron or manganese loading are required at SC3 because iron and manganese concentrations in Sewickley Creek at SC3 did not exceed corresponding water quality criteria based on in-stream samples collected in 2008 when the TMDL was developed. However, aluminum concentrations at SC3 did exceed aluminum criteria. Therefore, after identifying point-source discharges and determining WLAs for those point sources, DEP determined the balance of allowable loading from non-point sources and the reductions that would be necessary for those point sources to achieve water quality criteria in-stream. The WLAs at SC3 were developed solely for another industrial discharger, Reserved Environmental Services (PA0254185), so there are no WLAs for Powerex.

As required by 40 CFR § 122.44(d)(1)(vii)(B), to be consistent with the TMDL and its lack of WLAs for Powerex, effluent limits for aluminum are imposed at the level of water quality criteria. The 750 µg/L aluminum criterion in 25 Pa. Code § 93.8c is an acute criterion. Therefore, 750 µg/L is imposed as a maximum daily limit. There is no chronic criterion for aluminum necessitating the imposition of a more stringent average monthly limit. Imposing 750 µg/L as both a maximum daily and average monthly limit is protective of water quality uses.

In its pre-draft survey response, Powerex indicated that it can achieve the proposed WQBELs now based on adjustments to the facility's treatment process. Therefore, no schedule of compliance is included in the permit for the new TMDL WQBELs for Total Aluminum.

001.C. Effluent Limitations and Monitoring Requirements for Outfall 001

In accordance with 25 Pa. Code §§ 92a.12 and 92a.61 and anti-backsliding requirements under Section 402(o) of the Clean Water Act and 40 CFR § 122.44(l) (incorporated in Pennsylvania's regulations at 25 Pa. Code § 92a.44), effluent limits at Outfall 001 are the more stringent of TBELs, WQBELs, regulatory effluent standards, and monitoring requirements developed for this permit renewal; and effluent limits and monitoring requirements from the previous permit, subject to any exceptions to anti-backsliding discussed previously in this Fact Sheet. Applicable effluent limits and monitoring requirements are summarized in the table below.

Table 13. Effluent Limits and Monitoring Requirements for Outfall 001

Parameter	Mass (pounds)		Concentration (mg/L)			Basis
	Average Monthly	Maximum Daily	Avg. Mo.	Max Daily	IMAX	
Flow (MGD)	Report	Report	—	—	—	25 Pa. Code § 92a.61(d); 40 CFR 122.44(l)
pH (s.u.)	—	—	6.0 (Minimum)	—	9.0	25 Pa. Code §§ 92a.47(a)(7) & 95.2(1)
Dissolved Oxygen	—	—	4.0 (Minimum)	—	—	BPJ TBEL; 25 Pa. Code § 92a.48(a)(3)
Total Residual Chlorine	—	—	0.5	1.25	—	25 Pa. Code § 92a.47(a)(8)
$CBOD_5$ May 1 – October 31	—	—	10.0	20.0	—	WQBELs; 40 CFR § 122.44(l)
$CBOD_5$ November 1 – April 30	—	—	20.0	40.0	—	WQBELs; 40 CFR § 122.44(l)
Total Suspended Solids	—	—	30.0	60.0	—	25 Pa. Code § 92a.47(a)(1)
Fecal Coliform (No. /100mL) May 1 – September 30	—	—	200 (Geo. Mean)	—	1,000	25 Pa. Code § 92a.47(a)(4)

Table 13 (cont'd). Effluent Limits and Monitoring Requirements for Outfall 001

Parameter	Mass (pounds)		Concentration (mg/L)			Basis
	Average Monthly	Maximum Daily	Avg. Mo.	Max Daily	IMAX	
Fecal Coliform (No. /100mL) October 1 – April 30	—	—	2,000 (Geo. Mean)	—	10,000	25 Pa. Code § 92a.47(a)(5)
Total Nitrogen	—	—	—	Report	—	25 Pa. Code § 92a.61(b)
Ammonia-Nitrogen May 1 – October 31	—	—	3.0	6.0	—	WQBELs; 40 CFR § 122.44(l)
Ammonia-Nitrogen November 1 – April 30	—	—	9.0	18.0	—	WQBELs; 40 CFR § 122.44(l)
Total Phosphorus	—	—	—	Report	—	25 Pa. Code § 92a.61(b)
Aluminum, Total	—	—	0.75	0.75	—	40 CFR § 122.44(d)(1)(vii)(B); TMDL WQBELs
Iron, Total	—	—	—	Report	—	25 Pa. Code §§ 92a.61(b) & 96.4(i)
Manganese, Total	—	—	—	Report	—	25 Pa. Code §§ 92a.61(b) & 96.4(i)
Perfluorooctanoic acid (PFOA) (ng/L)	—	—	—	Report	—	25 Pa. Code § 92a.61(b)
Perfluorooctanesulfonic acid (PFOS) (ng/L)	—	—	—	Report	—	25 Pa. Code § 92a.61(b)
Perfluorobutanesulfonic acid (PFBS) (ng/L)	—	—	—	Report	—	25 Pa. Code § 92a.61(b)
Hexafluoropropylene oxide dimer acid (HFPO-DA) (ng/L)	—	—	—	Report	—	25 Pa. Code § 92a.61(b)

Monitoring frequencies and sample types are imposed in accordance with the recommendations for sewage discharges from Chapter 6, Table 6-3 of DEP's *Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits*. Based on that guidance, $CBOD_5$, ammonia-nitrogen, and total suspended solids must be sampled 1/week using 24-hour composite sampling; TRC, dissolved oxygen, and pH must be sampled daily when discharging using grab samples; fecal coliform must be sampled 1/week using grab samples; total nitrogen and total phosphorus must be sampled 1/month using grab samples; Total Aluminum must be sampled 2/month using grab samples; Total Ion and Total Manganese must be sampled 1/quarter using grab samples. Grab samples should be representative of the effluent and are to be taken at a time when the normal daily maximum flow would reach the sampling point. Flow must be metered continuously.

The PFAS parameters will be subject to grab sampling 1/year.

Development of Effluent Limitations

Outfall No. 002 **Design Flow (MGD)** Variable
Latitude 40° 13' 54.26" **Longitude** -79° 34' 7.18"
Wastewater Description: Storm water

Outfall 002 discharges storm water runoff from a 135,00 sq. ft. area that consists of a gently sloping (0 to 5% slope) business park with mowed lawn, parking lots, roads, and buildings. Discharges from Outfall 002 are currently subject to the following monitoring requirements.

Table 14. Outfall 002 – Current Effluent Limits and Monitoring Requirements

Parameter	Average Monthly	IMAX	Units	Measurement Frequency	Sample Type	Limit Basis
pH	—	Report	s.u.	2/month	Grab	25 Pa. Code § 92a.61(h)
Total Suspended Solids	Report	Report	mg/L	2/month	Grab	25 Pa. Code § 92a.61(h)
Oil and Grease	Report	Report	mg/L	2/month	Grab	25 Pa. Code § 92a.61(h)
Aluminum, Total	Report	Report	mg/L	2/month	Grab	25 Pa. Code § 92a.61(h)
Iron, Total	Report	Report	mg/L	2/month	Grab	25 Pa. Code § 92a.61(h)
Manganese, Total	Report	Report	mg/L	2/month	Grab	25 Pa. Code § 92a.61(h)

The monitoring requirements in Table 14 will remain in effect in the renewed permit pursuant to anti-backsliding requirements under Section 402(o) of the Clean Water Act (33 U.S.C. §1342(o)) and/or 40 CFR § 122.44(l) (incorporated by reference at 25 Pa. Code § 92a.44) unless the limits are superseded by more stringent limits developed for this renewal or are relaxed pursuant to the anti-backsliding exceptions listed in 33 U.S.C. §1342(o) or 40 CFR § 122.44(l).

002.A. Technology-Based Effluent Limitations (TBELs)

40 CFR § 122.44(a)(1) (incorporated by reference at 25 Pa. Code § 92a.44) requires NPDES permits to include conditions meeting technology-based effluent limitations and standards. Powerex's storm water discharges are not subject to any Federal ELGs. Therefore, in the absence of ELGs, case-by-case TBELs, if warranted, are developed based on DEP's Best Professional Judgment (BPJ).

Consistent with 25 Pa. Code § 92a.61(h) and DEP's policy for permitting storm water discharges associated with industrial activities, minimum standards described in DEP's PAG-03 NPDES General Permit for Discharges of Stormwater Associated with Industrial Activity are applied to the Clairton Plant's storm water discharges.[6] Based on Powerex's SIC Code of 3674, the facility would be classified under Appendix J – Additional Facilities of the PAG-03 General Permit.[7] Therefore, the monitoring requirements and sector-specific Best Management Practices (BMPs) of Appendix J of the PAG-03 are imposed as baseline requirements. The monitoring requirements of Appendix J in the current revision of the PAG-03 General Permit are shown in **Table 15**. Monitoring for additional pollutants is considered to the extent the baseline monitoring requirements from Appendix J do not capture the range of analytes present in Outfall 002's discharges.

Table 15. PAG-03 Appendix J – Minimum Monitoring Requirements

Discharge Parameter	Units	Minimum Measurement Frequency	Sample Type	Benchmark Values
Total Nitrogen †	mg/L	1/6 months	1 Grab	XXX
Total Phosphorus	mg/L	1/6 months	1 Grab	XXX
Total Suspended Solids	mg/L	1/6 months	1 Grab	100
Oil and Grease	mg/L	1/6 months	1 Grab	30
pH	S.U.	1/6 months	1 Grab	9.0
Chemical Oxygen Demand (COD)	mg/L	1/6 months	1 Grab	120

† Total Nitrogen is the sum of Total Kjeldahl-N (TKN) plus Nitrite-Nitrate as N (NO2+NO3-N), where TKN and NO2+NO3-N are measured in the same sample.

[6] Standard Operating Procedure (SOP) for Clean Water Program, Establishing Effluent Limitations for Individual Industrial Permits, Section III.C. (SOP No. BCW-PMT-032, February 5, 2024, Version 1.7): "The applicable appendix of the PAG-03 General Permit should be considered the minimum standards for limits, benchmarks and monitoring requirements for individual industrial stormwater permits. The application manager may include other limits, benchmarks and monitoring requirements as justified in the fact sheet."

[7] The determination of which of the PAG-03 General Permit's appendices applies to a facility is based on a facility's SIC Code. The requirements in Appendix J apply to storm water discharges associated with industrial activity from facilities whose industrial activity is not described by any other appendix of the PAG-03.

When the PAG-03 General Permit was renewed in 2023, Appendix J was updated to include semi-annual monitoring for Total Nitrogen, Total Phosphorus, and COD. Those parameters will be added to Outfall 002's semi-annual monitoring requirements.

As stated previously, in the absence of ELGs, case-by-case TBELs are developed based on BPJ. The development of case-by-case TBELs using BPJ typically involves the evaluation of end-of-pipe wastewater treatment technologies. However, consistent with 40 CFR § 122.44(k)(2), DEP considers the use of BMPs to be BAT for storm water discharges associated with industrial activities, unless effluent concentrations indicate that BMPs provide inadequate pollution control.

Analytical data reported on the NPDES permit renewal application are summarized in Table 16 and semi-annual monitoring data reported on DMRs from the second half of 2020 through the first half of 2024 are shown in Figures 2 and 3, below.

Table 16. Storm Water Analytical Results for Outfall 001A

Parameter	Average Conc. (mg/L)	Maximum Conc. (mg/L)	Parameter	Average Conc. (mg/L)	Maximum Conc. (mg/L)
Oil and Grease	<5.0	<5.0	Aluminum	0.5044	0.915
BOD5	<3.6	<3.6	Copper	<0.005	<0.005
COD	<25	0.27	Iron	0.779	1.27
TSS	7.5	11.0	Lead	<0.01	<0.01
Total Nitrogen	1.67	1.67	Zinc	<0.02	<0.02
Total Phosphorus	<0.03	<0.03	Manganese	0.0571	0.0571
pH (s.u.)	7.72	7.72			

Figure 2. Outfall 002 - Al, Fe, & Mn Concentrations

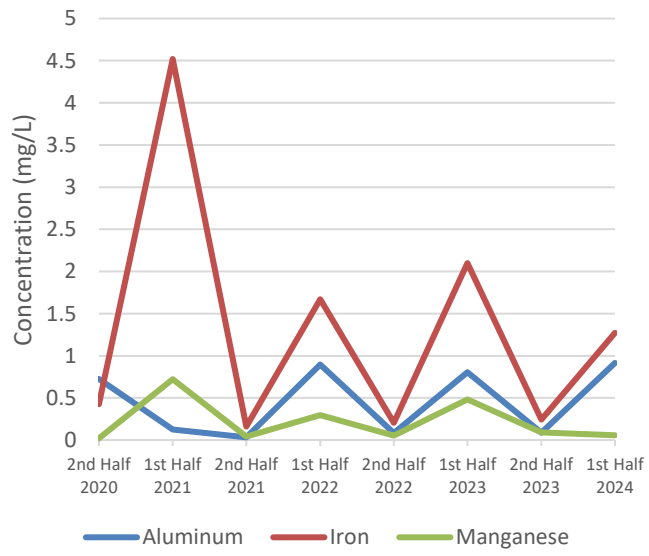
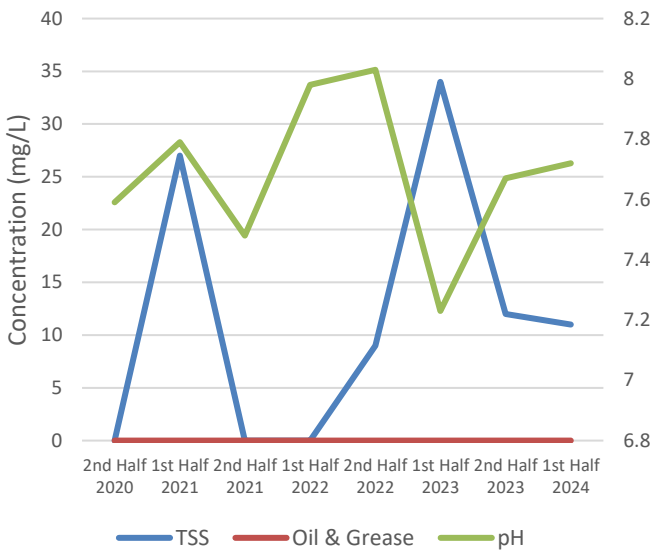


Figure 3. TSS, Oil & Grease, and pH Concentrations



Non-detect values are shown as zero.

Based on the results in Table 16 and Figures 2 and 3, no TBELs are imposed at Outfall 002. Pollutants generally are present in low concentrations except for Total Iron, which is slightly elevated, but not at concentrations expected to cause acute adverse impacts. TBELs may be warranted in the future if concentrations in storm water consistently exceed the benchmark values shown in Table 15. DEP uses benchmark monitoring in the PAG-03 as an indicator of the effectiveness of a facility's BMPs. The benchmark values are not effluent limitations and exceedances do not constitute permit violations. However, if sampling demonstrates exceedances of benchmark values for two or more consecutive monitoring periods, then Powerex must submit a Corrective Action Plan within 90 days of the end of the monitoring period triggering the plan. The Corrective Action Plan requirement and the benchmark values will be specified in a condition in Part C of the permit. Consistent with the requirements of the 2023 PAG-03 General Permit upon which Outfall 002's requirements are based, four or more consecutive exceedances of the benchmark values will require a graduated response.

002.B. Water Quality-Based Effluent Limitations (WQBELs)

Generally, DEP does not develop numerical WQBELs for storm water discharges. Pursuant to 25 Pa. Code § 96.4(g), mathematical modeling used to develop WQBELs must be performed at Q_{7-10} low flow conditions. Precipitation-induced discharges generally do not occur at Q_{7-10} conditions because the precipitation that causes a storm water discharge also will increase the receiving stream's flow and that increased stream flow will provide additional assimilative capacity during a storm event. That does not preclude the potential for adverse effects to aquatic life caused by acute exposure during a storm event and intermittent chronic exposures (particularly for bioaccumulative pollutants) from multiple storm events as they naturally recur. Mathematically modeling such effects for wet weather conditions is not procedurally defined, which is why 40 CFR § 122.44(k)(2) and 25 Pa. Code § 92a.46 provide for BMPs to control or abate the discharge of pollutants in lieu of numeric limits. Pursuant to those regulations, conditions in Part C of the permit will ensure compliance with water quality standards through the combination of benchmark monitoring and BMPs including pollution prevention and exposure minimization, good housekeeping, erosion and sediment control, and spill prevention and response.[8]

002.C. Effluent Limitations and Monitoring Requirements for Outfall 002

In accordance with 25 Pa. Code §§ 92a.12 and 92a.61 and anti-backsliding requirements under Section 402(o) of the Clean Water Act and 40 CFR § 122.44(l) (incorporated in Pennsylvania's regulations at 25 Pa. Code § 92a.44), effluent limits are the more stringent of TBELs, WQBELs, regulatory effluent standards, and monitoring requirements developed for this permit renewal; and effluent limits and monitoring requirements from the previous permit, subject to any exceptions to anti-backsliding discussed previously in this Fact Sheet. No TBELs are imposed at Outfall 002 (other than BMPs) and no WQBELs apply at this time, so monitoring and reporting requirements are the most stringent requirements.

Table 17. Effluent Limits and Monitoring Requirements for Outfall 002

Parameter	Mass (pounds)		Concentration (mg/L)			Basis
	Average Monthly	Daily Maximum	Average Monthly	Daily Maximum	Instant Maximum	
pH (S.U.)	—	—	—	Report	—	25 Pa. Code § 92a.61(h); PAG-03, App. J
Total Suspended Solids	—	—	—	Report	—	25 Pa. Code § 92a.61(h); PAG-03, App. J
Chemical Oxygen Demand (COD)	—	—	—	Report	—	25 Pa. Code § 92a.61(h); PAG-03, App. J
Oil and Grease	—	—	—	Report	—	25 Pa. Code § 92a.61(h); PAG-03, App. J
Aluminum, Total	—	—	—	Report	—	25 Pa. Code § 92a.61(h)
Iron, Total	—	—	—	Report	—	25 Pa. Code § 92a.61(h)
Manganese, Total	—	—	—	Report	—	25 Pa. Code § 92a.61(h)
Nitrogen, Total	—	—	—	Report	—	25 Pa. Code § 92a.61(h); PAG-03, App. J
Phosphorus, Total	—	—	—	Report	—	25 Pa. Code § 92a.61(h); PAG-03, App. J

The monitoring frequency and sample type for pH, TSS, Total Iron, and Total Zinc will remain unchanged (2/month grab sampling). The remaining parameters will require grab sampling 1/6 months.

[8] Benchmark values are generally based on water quality criteria (mostly acute aquatic life criteria, but also chronic criteria for bioaccumulative pollutants), so the permit's iterative requirements for responding to consecutive benchmark value exceedances will minimize the potential for water quality concerns.

Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 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, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 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, 386-2000-010, 3/1999.
☐	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other:

ATTACHMENT A

Toxics Management Spreadsheet for Outfall 001

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Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **Powerex Inc. - Youngwood Plant** NPDES Permit No.: **PA0001201** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Process and sanitary wastewaters**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.048	255.9	7.2						

					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		630									
	Chloride (PWS)	mg/L		111									
	Bromide	mg/L		0.654									
	Sulfate (PWS)	mg/L		134									
	Fluoride (PWS)	mg/L		20.2									
Group 2	Total Aluminum	µg/L		2700									
	Total Antimony	µg/L		0.3									
	Total Arsenic	µg/L		5									
	Total Barium	µg/L		28									
	Total Beryllium	µg/L		0.2									
	Total Boron	µg/L		125									
	Total Cadmium	µg/L		0.2									
	Total Chromium (III)	µg/L		2.5									
	Hexavalent Chromium	µg/L		0.18									
	Total Cobalt	µg/L		0.5									
	Total Copper	µg/L		6									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L		11									
	Dissolved Iron	µg/L		10									
	Total Iron	µg/L		418									
	Total Lead	µg/L		0.5									
	Total Manganese	µg/L		85									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		8									
	Total Phenols (Phenolics) (PWS)	µg/L		2.5									
	Total Selenium	µg/L		0.25									
	Total Silver	µg/L		0.5									
	Total Thallium	µg/L	<	0.05									
	Total Zinc	µg/L		35									
	Total Molybdenum	µg/L		251									
	Acrolein	µg/L	<	0.25									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	0.15									
	Benzene	µg/L	<	0.2									
	Bromoform	µg/L		1.8									

Group 3	Carbon Tetrachloride	µg/L	<	0.2									
	Chlorobenzene	µg/L	<	0.25									
	Chlorodibromomethane	µg/L		2.8									
	Chloroethane	µg/L	<	0.45									
	2-Chloroethyl Vinyl Ether	µg/L	<	0.15									
	Chloroform	µg/L		4.4									
	Dichlorobromomethane	µg/L		2.8									
	1,1-Dichloroethane	µg/L	<	0.2									
	1,2-Dichloroethane	µg/L	<	0.15									
	1,1-Dichloroethylene	µg/L	<	0.1									
	1,2-Dichloropropane	µg/L	<	0.15									
	1,3-Dichloropropylene	µg/L	<	0.25									
	1,4-Dioxane	µg/L	<	0.05									
	Ethylbenzene	µg/L	<	0.1									
	Methyl Bromide	µg/L	<	0.5									
	Methyl Chloride	µg/L	<	0.25									
	Methylene Chloride	µg/L	<	0.25									
	1,1,2,2-Tetrachloroethane	µg/L	<	0.25									
	Tetrachloroethylene	µg/L	<	0.25									
	Toluene	µg/L	<	0.25									
	1,2-trans-Dichloroethylene	µg/L	<	0.25									
	1,1,1-Trichloroethane	µg/L	<	0.25									
	1,1,2-Trichloroethane	µg/L	<	0.3									
	Trichloroethylene	µg/L	<	0.25									
	Vinyl Chloride	µg/L	<	0.25									
Group 4	2-Chlorophenol	µg/L	<	0.476									
	2,4-Dichlorophenol	µg/L	<	0.476									
	2,4-Dimethylphenol	µg/L	<	0.476									
	4,6-Dinitro-o-Cresol	µg/L	<	1.43									
	2,4-Dinitrophenol	µg/L	<	1.43									
	2-Nitrophenol	µg/L	<	0.476									
	4-Nitrophenol	µg/L	<	1.43									
	p-Chloro-m-Cresol	µg/L	<	0.476									
	Pentachlorophenol	µg/L	<	0.476									
	Phenol	µg/L	<	1.43									
	2,4,6-Trichlorophenol	µg/L	<	0.476									
Group 5	Acenaphthene	µg/L	<	0.476									
	Acenaphthylene	µg/L	<	0.476									
	Anthracene	µg/L	<	0.472									
	Benzidine	µg/L	<	2.38									
	Benzo(a)Anthracene	µg/L	<	0.476									
	Benzo(a)Pyrene	µg/L	<	0.476									
	3,4-Benzofluoranthene	µg/L	<	0.476									
	Benzo(ghi)Perylene	µg/L	<	0.476									
	Benzo(k)Fluoranthene	µg/L	<	0.476									
	Bis(2-Chloroethoxy)Methane	µg/L	<	0.476									
	Bis(2-Chloroethyl)Ether	µg/L	<	0.476									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	0.476									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	1.43									
	4-Bromophenyl Phenyl Ether	µg/L	<	0.476									
	Butyl Benzyl Phthalate	µg/L	<	1.43									
	2-Chloronaphthalene	µg/L	<	0.476									
	4-Chlorophenyl Phenyl Ether	µg/L	<	0.476									
	Chrysene	µg/L	<	0.476									
	Dibenzo(a,h)Anthrancene	µg/L	<	0.476									
	1,2-Dichlorobenzene	µg/L	<	0.2									
	1,3-Dichlorobenzene	µg/L	<	0.197									
	1,4-Dichlorobenzene	µg/L	<	0.216									
	3,3-Dichlorobenzidine	µg/L	<	0.476									
	Diethyl Phthalate	µg/L	<	0.476									
	Dimethyl Phthalate	µg/L	<	0.476									
	Di-n-Butyl Phthalate	µg/L	<	1.43									
	2,4-Dinitrotoluene	µg/L	<	0.476									

	2,6-Dinitrotoluene	µg/L	<	0.476										
	Di-n-Octyl Phthalate	µg/L	<	0.476										
	1,2-Diphenylhydrazine	µg/L	<	0.476										
	Fluoranthene	µg/L	<	0.476										
	Fluorene	µg/L	<	0.476										
	Hexachlorobenzene	µg/L	<	0.476										
	Hexachlorobutadiene	µg/L	<	0.476										
	Hexachlorocyclopentadiene	µg/L	<	0.476										
	Hexachloroethane	µg/L	<	0.476										
	Indeno(1,2,3-cd)Pyrene	µg/L	<	0.476										
	Isophorone	µg/L	<	0.476										
	Naphthalene	µg/L	<	0.476										
	Nitrobenzene	µg/L	<	0.476										
	n-Nitrosodimethylamine	µg/L	<	0.476										
	n-Nitrosodi-n-Propylamine	µg/L	<	0.476										
	n-Nitrosodiphenylamine	µg/L	<	0.476										
	Phenanthrene	µg/L	<	0.476										
	Pyrene	µg/L	<	0.476										
	1,2,4-Trichlorobenzene	µg/L	<	0.476										
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Powerex Inc. - Youngwood Plant, NPDES Permit No. PA0001201, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Sewickley Creek**

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	037556	20.4	937	44.3	0.0012		Yes
End of Reach 1	037556	19.61	932	73.9	0.0012		Yes

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

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	20.4	0.0329			3.5							100	7		
End of Reach 1	19.61	0.0368													

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	20.4														
End of Reach 1	19.61														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Powerex Inc. - Youngwood Plant, NPDES Permit No. PA0001201, Outfall 001

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

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
20.4	1.46		1.46	0.074	0.001	0.608	2.127	3.5	0.103	0.469	0.342
19.61	2.55		2.54675								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
20.4	10.33		10.33	0.074	0.001	1.412	2.127	1.507	0.301	0.16	0.105
19.61	16.82		16.82								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.342 PMF: 1 Analysis Hardness (mg/l): 107.56 Analysis pH: 7.01

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	15,471	
Total Antimony	0	0		0	1,100	1,100	22,690	
Total Arsenic	0	0		0	340	340	7,013	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	433,180	
Total Boron	0	0		0	8,100	8,100	167,084	
Total Cadmium	0	0		0	2.162	2.3	47.4	Chem Translator of 0.941 applied
Total Chromium (III)	0	0		0	604.797	1,914	39,480	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	336	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	1,960	
Total Copper	0	0		0	14.394	15.0	309	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	69.907	89.6	1,848	Chem Translator of 0.78 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	34.0	Chem Translator of 0.85 applied
Total Nickel	0	0		0	498.005	499	10,293	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	3.646	4.29	88.5	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	1,341	
Total Zinc	0	0		0	124.642	127	2,629	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	61.9	
Acrylonitrile	0	0		0	650	650	13,408	
Benzene	0	0		0	640	640	13,202	
Bromoform	0	0		0	1,800	1,800	37,130	
Carbon Tetrachloride	0	0		0	2,800	2,800	57,757	
Chlorobenzene	0	0		0	1,200	1,200	24,753	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	371,298	
Chloroform	0	0		0	1,900	1,900	39,193	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	309,415	
1,1-Dichloroethylene	0	0		0	7,500	7,500	154,707	
1,2-Dichloropropane	0	0		0	11,000	11,000	226,904	
1,3-Dichloropropylene	0	0		0	310	310	6,395	
Ethylbenzene	0	0		0	2,900	2,900	59,820	
Methyl Bromide	0	0		0	550	550	11,345	
Methyl Chloride	0	0		0	28,000	28,000	577,574	
Methylene Chloride	0	0		0	12,000	12,000	247,532	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	20,628	
Tetrachloroethylene	0	0		0	700	700	14,439	
Toluene	0	0		0	1,700	1,700	35,067	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	140,268	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	61,883	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	70,134	
Trichloroethylene	0	0		0	2,300	2,300	47,444	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	11,551	
2,4-Dichlorophenol	0	0		0	1,700	1,700	35,067	
2,4-Dimethylphenol	0	0		0	660	660	13,614	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	1,650	
2,4-Dinitrophenol	0	0		0	660	660	13,614	
2-Nitrophenol	0	0		0	8,000	8,000	165,021	
4-Nitrophenol	0	0		0	2,300	2,300	47,444	
p-Chloro-m-Cresol	0	0		0	160	160	3,300	
Pentachlorophenol	0	0		0	8.792	8.79	181	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	9,489	

Acenaphthene	0	0		0	83	83.0	1,712	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	6,188	
Benzo(a)Anthracene	0	0		0	0.5	0.5	10.3	
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	618,829	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	92,824	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	5,569	
Butyl Benzyl Phthalate	0	0		0	140	140	2,888	
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	16,915	
1,3-Dichlorobenzene	0	0		0	350	350	7,220	
1,4-Dichlorobenzene	0	0		0	730	730	15,058	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	82,511	
Dimethyl Phthalate	0	0		0	2,500	2,500	51,569	
Di-n-Butyl Phthalate	0	0		0	110	110	2,269	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	33,004	
2,6-Dinitrotoluene	0	0		0	990	990	20,421	
1,2-Diphenylhydrazine	0	0		0	15	15.0	309	
Fluoranthene	0	0		0	200	200	4,126	
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	206	
Hexachlorocyclopentadiene	0	0		0	5	5.0	103	
Hexachloroethane	0	0		0	60	60.0	1,238	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	206,276	
Naphthalene	0	0		0	140	140	2,888	
Nitrobenzene	0	0		0	4,000	4,000	82,511	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	350,670	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	6,188	
Phenanthrene	0	0		0	5	5.0	103	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	2,682	

☑ ***CFC*** CCT (min): 0.342 PMF: 1 Analysis Hardness (mg/l): 107.56 Analysis pH: 7.01

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	4,538	
Total Arsenic	0	0		0	150	150	3,094	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	84,573	
Total Boron	0	0		0	1,600	1,600	33,004	
Total Cadmium	0	0		0	0.259	0.29	5.89	Chem Translator of 0.906 applied
Total Chromium (III)	0	0		0	78.672	91.5	1,887	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	214	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	392	
Total Copper	0	0		0	9.531	9.93	205	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	30,941	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.724	3.49	72.0	Chem Translator of 0.78 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	18.7	Chem Translator of 0.85 applied
Total Nickel	0	0		0	55.313	55.5	1,144	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	103	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	268	
Total Zinc	0	0		0	125.662	127	2,629	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	61.9	
Acrylonitrile	0	0		0	130	130	2,682	
Benzene	0	0		0	130	130	2,682	
Bromoform	0	0		0	370	370	7,632	
Carbon Tetrachloride	0	0		0	560	560	11,551	
Chlorobenzene	0	0		0	240	240	4,951	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	72,197	
Chloroform	0	0		0	390	390	8,045	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	63,946	
1,1-Dichloroethylene	0	0		0	1,500	1,500	30,941	
1,2-Dichloropropane	0	0		0	2,200	2,200	45,381	
1,3-Dichloropropylene	0	0		0	61	61.0	1,258	
Ethylbenzene	0	0		0	580	580	11,964	
Methyl Bromide	0	0		0	110	110	2,269	
Methyl Chloride	0	0		0	5,500	5,500	113,452	
Methylene Chloride	0	0		0	2,400	2,400	49,506	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	4,332	
Tetrachloroethylene	0	0		0	140	140	2,888	
Toluene	0	0		0	330	330	6,807	

1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	28,879	
1,1,1-Trichloroethane	0	0		0	610	610	12,583	
1,1,2-Trichloroethane	0	0		0	680	680	14,027	
Trichloroethylene	0	0		0	450	450	9,282	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	2,269	
2,4-Dichlorophenol	0	0		0	340	340	7,013	
2,4-Dimethylphenol	0	0		0	130	130	2,682	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	330	
2,4-Dinitrophenol	0	0		0	130	130	2,682	
2-Nitrophenol	0	0		0	1,600	1,600	33,004	
4-Nitrophenol	0	0		0	470	470	9,695	
p-Chloro-m-Cresol	0	0		0	500	500	10,314	
Pentachlorophenol	0	0		0	6.746	6.75	139	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	1,877	
Acenaphthene	0	0		0	17	17.0	351	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	1,217	
Benzo(a)Anthracene	0	0		0	0.1	0.1	2.06	
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	123,766	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	18,771	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	1,114	
Butyl Benzyl Phthalate	0	0		0	35	35.0	722	
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	3,300	
1,3-Dichlorobenzene	0	0		0	69	69.0	1,423	
1,4-Dichlorobenzene	0	0		0	150	150	3,094	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	16,502	
Dimethyl Phthalate	0	0		0	500	500	10,314	
Di-n-Butyl Phthalate	0	0		0	21	21.0	433	
2,4-Dinitrotoluene	0	0		0	320	320	6,601	
2,6-Dinitrotoluene	0	0		0	200	200	4,126	
1,2-Diphenylhydrazine	0	0		0	3	3.0	61.9	
Fluoranthene	0	0		0	40	40.0	825	
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	41.3	

Hexachlorocyclopentadiene	0	0		0	1	1.0	20.6	
Hexachloroethane	0	0		0	12	12.0	248	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	43,318	
Naphthalene	0	0		0	43	43.0	887	
Nitrobenzene	0	0		0	810	810	16,708	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	70,134	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	1,217	
Phenanthrene	0	0		0	1	1.0	20.6	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	536	

☑ ***THH*** CCT (min): 0.342 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Fluoride (PWS)	0	0		0	2,000	2,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	116	
Total Arsenic	0	0		0	10	10.0	206	
Total Barium	0	0		0	2,400	2,400	49,506	
Total Boron	0	0		0	3,100	3,100	63,946	
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	6,188	
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	20,628	
Total Mercury	0	0		0	0.050	0.05	1.03	
Total Nickel	0	0		0	610	610	12,583	
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	4.95	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	61.9	
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	2,063	
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	118	
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	681	
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	1,403	
Methyl Bromide	0	0		0	100	100.0	2,063	
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	1,176	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	2,063	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	206,276	
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	619	
2,4-Dichlorophenol	0	0		0	10	10.0	206	
2,4-Dimethylphenol	0	0		0	100	100.0	2,063	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	41.3	
2,4-Dinitrophenol	0	0		0	10	10.0	206	
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	82,511	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	1,444	
Anthracene	0	0		0	300	300	6,188	
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	4,126	
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	2.06	
2-Chloronaphthalene	0	0		0	800	800	16,502	
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	20,628	
1,3-Dichlorobenzene	0	0		0	7	7.0	144	
1,4-Dichlorobenzene	0	0		0	300	300	6,188	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	12,377	
Dimethyl Phthalate	0	0		0	2,000	2,000	41,255	
Di-n-Butyl Phthalate	0	0		0	20	20.0	413	
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	413	
Fluorene	0	0		0	50	50.0	1,031	
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	82.5	
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	701	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	206	
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	413	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	1.44	

☑ ***CRL*** CCT (min): 0.105 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	
Acrylonitrile	0	0		0	0.06	0.06	8.4	
Benzene	0	0		0	0.58	0.58	81.2	
Bromoform	0	0		0	7	7.0	981	
Carbon Tetrachloride	0	0		0	0.4	0.4	56.0	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	112	
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	133	
1,2-Dichloroethane	0	0		0	9.9	9.9	1,387	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	126	
1,3-Dichloropropylene	0	0		0	0.27	0.27	37.8	
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	2,801	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	28.0	
Tetrachloroethylene	0	0		0	10	10.0	1,401	
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	77.0	
Trichloroethylene	0	0		0	0.6	0.6	84.0	
Vinyl Chloride	0	0		0	0.02	0.02	2.8	
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	4.2	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	210	
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	0.014	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.14	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.014	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.14	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	1.4	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	4.2	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	44.8	
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	16.8	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.014	
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	7.0	
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	7.0	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	7.0	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	4.2	
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	0.011	
Hexachlorobutadiene	0	0		0	0.01	0.01	1.4	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	14.0	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.14	
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	0.098	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.7	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	462	

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	Report	Report	Report	Report	Report	µg/L	9,916	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	116	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	206	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	49,506	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	33,004	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	5.89	µg/L	Discharge Conc ≤ 10% WQBEL
Total Chromium (III)	1,887	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	214	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	392	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	198	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	6,188	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	30,941	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	72.0	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	20,628	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	1.03	µg/L	Discharge Conc < TQL
Total Nickel	1,144	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	103	µg/L	Discharge Conc ≤ 10% WQBEL

Total Silver	56.7	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	4.95	µg/L	Discharge Conc < TQL
Total Zinc	1,685	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	39.7	µg/L	Discharge Conc < TQL
Acrylonitrile	8.4	µg/L	Discharge Conc < TQL
Benzene	81.2	µg/L	Discharge Conc < TQL
Bromoform	981	µg/L	Discharge Conc ≤ 25% WQBEL
Carbon Tetrachloride	56.0	µg/L	Discharge Conc < TQL
Chlorobenzene	2,063	µg/L	Discharge Conc < TQL
Chlorodibromomethane	112	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	72,197	µg/L	Discharge Conc < TQL
Chloroform	118	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	133	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	1,387	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	681	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	126	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	37.8	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	1,403	µg/L	Discharge Conc < TQL
Methyl Bromide	2,063	µg/L	Discharge Conc < TQL
Methyl Chloride	113,452	µg/L	Discharge Conc < TQL
Methylene Chloride	2,801	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	28.0	µg/L	Discharge Conc < TQL
Tetrachloroethylene	1,401	µg/L	Discharge Conc < TQL
Toluene	1,176	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	2,063	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	12,583	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	77.0	µg/L	Discharge Conc < TQL
Trichloroethylene	84.0	µg/L	Discharge Conc < TQL
Vinyl Chloride	2.8	µg/L	Discharge Conc < TQL
2-Chlorophenol	619	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	206	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	2,063	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	41.3	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	206	µg/L	Discharge Conc < TQL
2-Nitrophenol	33,004	µg/L	Discharge Conc < TQL
4-Nitrophenol	9,695	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	2,115	µg/L	Discharge Conc < TQL
Pentachlorophenol	4.2	µg/L	Discharge Conc < TQL
Phenol	82,511	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	210	µg/L	Discharge Conc < TQL
Acenaphthene	351	µg/L	Discharge Conc < TQL

Acenaphthylene	N/A	N/A	No WQS
Anthracene	6,188	µg/L	Discharge Conc < TQL
Benzidine	0.014	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.14	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.014	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.14	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	1.4	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	4.2	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	4,126	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	44.8	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	1,114	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	2.06	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	16,502	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	16.8	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.014	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	3,300	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	144	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	3,094	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	7.0	µg/L	Discharge Conc < TQL
Diethyl Phthalate	12,377	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	10,314	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	413	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	7.0	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	7.0	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	4.2	µg/L	Discharge Conc < TQL
Fluoranthene	413	µg/L	Discharge Conc < TQL
Fluorene	1,031	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.011	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	1.4	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	20.6	µg/L	Discharge Conc < TQL
Hexachloroethane	14.0	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.14	µg/L	Discharge Conc < TQL
Isophorone	701	µg/L	Discharge Conc < TQL
Naphthalene	887	µg/L	Discharge Conc < TQL
Nitrobenzene	206	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.098	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.7	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	462	µg/L	Discharge Conc < TQL
Phenanthrene	20.6	µg/L	Discharge Conc < TQL
Pyrene	413	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	1.44	µg/L	Discharge Conc < TQL

ATTACHMENT B

WQM 7.0 Modeling Results

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
19D	37556	SEWICKLEY CREEK	**20.400**	937.00	44.30	0.00120	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 (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.033	0.00	0.00	0.000	0.000	3.5	0.00	0.00	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 (°C)	Disc pH
Outfall 001	PA0001201	0.0480	0.0000	0.0000	0.000	20.00	7.20

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	4.00	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
19D	37556	SEWICKLEY CREEK	**18.650**	926.60	80.00	0.00120	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 (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.023	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	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 (°C)	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
19D	37556	SEWICKLEY CREEK

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 (°C)	Analysis pH
Q7-10 Flow												
20.400	1.46	0.00	1.46	.0743	0.00120	.608	24.49	40.29	0.10	1.039	24.76	7.01
Q1-10 Flow												
20.400	0.93	0.00	0.93	.0743	0.00120	NA	NA	NA	0.08	1.314	24.63	7.01
Q30-10 Flow												
20.400	1.98	0.00	1.98	.0743	0.00120	NA	NA	NA	0.12	0.881	24.82	7.01

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	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19D	37556	SEWICKLEY CREEK

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
20.400	Outfall 001	11.3	50	11.3	50	0	0

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
20.400	Outfall 001	1.38	25	1.38	25	0	0

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)		
20.40	Outfall 001	25	25	25	25	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19D	37556	SEWICKLEY CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
20.400	0.048	24.758	7.008
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
24.489	0.608	40.294	0.103
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.12	0.313	1.21	1.010
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.168	1.314	Tsivoglou	5
Reach Travel Time (days)			
1.039			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.104	2.99	1.09	7.51
0.208	2.87	0.98	7.00
0.312	2.76	0.88	6.60
0.416	2.65	0.80	6.30
0.520	2.54	0.72	6.08
0.624	2.44	0.65	5.93
0.727	2.35	0.58	5.84
0.831	2.25	0.52	5.79
0.935	2.16	0.47	5.78
1.039	2.08	0.42	5.79

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19D	37556	SEWICKLEY CREEK

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)
20.400	Outfall 001	PA0001201	0.048	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			4

ATTACHMENT C

TRC Modeling Results

TRC EVALUATION – Outfall 001

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

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	**1.3.2.iii**	WLA afc = 6.291	**1.3.2.iii**	WLA cfc = 6.126
PENTOXSD TRG	**5.1a**	LTAMULT afc = 0.373	**5.1c**	LTAMULT cfc = 0.581
PENTOXSD TRG	**5.1b**	LTA_afc= 2.344	**5.1d**	LTA_cfc = 3.561

Source	Reference	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)**