pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0221449**
Facility Type	**Municipal**	APS ID	**1061683**
Major / Minor	**Minor**	Authorization ID	**1393103**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Buffalo Township Municipal Authority**	Facility Name	**Buffalo Township Municipal Authority STP**
Applicant Address	707 South Pike Road	Facility Address	161 Monroe Road
	Sarver, PA 16055-9201		Sarver, PA 16055
Applicant Contact	Kristine Donaldson	Facility Contact	Kristine Donaldson
Applicant Phone	(724) 383-2259 (mabt@zoominternet.net)	Facility Phone	
Client ID	62915	Site ID	262419
Ch 94 Load Status	Not Overloaded	Municipality	Buffalo Township
Connection Status	No Limitations	County	Butler
Date Application Received	April 19, 2022	EPA Waived?	Yes
Date Application Accepted	May 2, 2022	If No, Reason	

Purpose of Application: Renewal of a NPDES Permit for an existing discharge of treated sewage.

Summary of Review

This is a publicly operated sewage treatment plant which services parts of Buffalo and Winfield Townships, Butler County. In addition, the facility has, and plans to continue accepting hauled in WTP filter backwash sludge.

No changes to discharge quantity or quality are proposed as part of this permit renewal.

There are currently five open violations listed in EFACTS for this client, all from the Safe Drinking Water Program (12/28/2023). *The permittee will be notified of the open violations in the Draft Permit Cover Letter and given an opportunity to address the violations prior to final permit issuance. CWY 12/29/2023*

Sludge use and disposal description and location(s): Dewatered sludge is hauled to Seneca Landfill for disposal.

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.

Approve	Deny	Signatures	Date
X		Adam J. Pesek Adam J. Pesek, E.I.T. / Project Manager	December 28, 2023
X		Chad W. Yurisic Chad W. Yurisic, P.E. / Environmental Engineer Manager	12/29/2023

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.89
Latitude	40º 42' 19"	Longitude	-79º 41' 38"
Quad Name	Freeport	Quad Code	1708
Wastewater Description:	Treated domestic sewage		

Receiving Waters	Buffalo Creek (TSF)	Stream Code	42557
NHD Com ID	123971892	RMI	3.42
Drainage Area	167.65	Yield (cfs/mi^2)	0.04284
Q_{7-10} Flow (cfs)	7.182	Q_{7-10} Basis	USGS #03049000 ('77-'11)
Elevation (ft)	778	Slope (ft/ft)	0.00183
Watershed No.	18-F	Chapter 93 Class.	TSF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	CAUSE UNKNOWN		
Source(s) of Impairment	SOURCE UNKNOWN		
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)	8.3	DEP 4/21/09 macroinvertebrate sample taken upstream
Temperature (°C)	20	Default
Hardness (mg/L)	108	7/13/17 upstream sample taken by permittee.
Other:		

Nearest Downstream Public Water Supply Intake		Harrison Twp. Water Authority	
PWS Waters	Allegheny River	Flow at Intake (cfs)	2390
PWS RMI	24.2	Distance from Outfall (mi)	8.0

Changes Since Last Permit Issuance: None

Other Comments:

Treatment Facility Summary

Treatment Facility Name: Buffalo Township Municipal Authority STP

WQM Permit No.	Issuance Date
1096406 A-1	5/16/2012

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary with Ammonia Reduction	Activated Sludge	Ultraviolet	0.89

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.89	1782	Not Overloaded	Aerobic Digestion	Landfill

Changes Since Last Permit Issuance: None

Other Comments: Treatment consists of influent pump station, aeration (4 tanks), settling (2 tanks), UV disinfection, sludge holding / aerobic digestion and sludge press.

Compliance History	
Summary of DMRs:	There have been ten effluent limit excursions since September 2018.
Summary of Inspections:	The last facility inspection was conducted on 8/6/2020. No violations or issues were report in the inspection report. Five are for D.O., four for fecal coliform, and one for TSS.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from November 1, 2022 to October 31, 2023)

Parameter	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22
Flow (MGD) Average Monthly	0.502	0.506	0.575	0.554	0.505	0.668	0.681	0.810	0.664	0.695	0.709	0.693
Flow (MGD) Weekly Average	0.502	0.596	0.630	0.598	0.557	0.747	0.773	0.906	0.680	0.784	0.808	0.792
pH (S.U.) Daily Minimum	6.04	6.0	6.03	6.05	6.0	6.18	6.35	6.04	6.26	6.18	6.08	6.07
pH (S.U.) Daily Maximum	7.07	6.47	6.58	6.52	6.4	6.61	6.77	6.81	6.65	6.72	6.62	6.77
DO (mg/L) Daily Minimum	6.06	5.54	5.29	4.93	4.78	4.77	4.5	4.33	4.15	4.13	4.2	4.31
CBOD5 (lbs/day) Average Monthly	< 10	< 10	< 10	< 11	< 12	< 15	15	19	< 16	< 12	< 13	< 9
CBOD5 (lbs/day) Weekly Average	< 10	16	< 11	15	23	19	18	30	14	< 20	17	< 13
CBOD5 (mg/L) Average Monthly	< 2.1	< 2.5	< 2.0	< 2.5	< 2.7	< 2.8	2.7	3.1	< 2.7	< 2.1	< 2.7	< 2.0
CBOD5 (mg/L) Weekly Average	< 2.0	3.5	< 2.0	3.4	5.0	3.3	3.3	3.9	2.5	2.4	4.9	< 2.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	589	552	606	480	< 589	669	602	465	768	< 383	560	570
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	765	624	981	604	849	767	829	549	915	< 598	656	859
BOD5 (mg/L) Raw Sewage Influent Average Monthly	138.1	136	135.1	104	< 135	121.8	108.4	78.3	141.8	< 67.3	118.7	120.2
TSS (lbs/day) Average Monthly	< 34	< 22	< 28	< 28	< 22	< 29	< 33	< 51	< 47	< 36	< 25	< 34
TSS (lbs/day) Raw Sewage Influent Average Monthly	441	430	414	350	728	354	318	358	667	387	496	495

TSS (lbs/day) Raw Sewage Influent Daily Maximum	593	641	500	401	1350	453	428	380	903	495	707	978
TSS (lbs/day) Weekly Average	< 25	27	40	43	< 24	38	43	103	61	< 50	< 31	60
TSS (mg/L) Average Monthly	< 6.8	< 5.5	< 5.8	< 6.0	< 5.0	< 5.2	< 6.0	< 8.0	< 8.0	< 6.4	< 5.0	< 7.2
TSS (mg/L) Raw Sewage Influent Average Monthly	103	104	87	76	171	64	58	61	125	70	108	103
TSS (mg/L) Weekly Average	5.0	6.0	7.0	9.0	< 5.0	6.0	8.0	14.0	11.0	8.0	< 5.0	11.0
Fecal Coliform (No./100 ml) Geometric Mean	< 6	< 4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Fecal Coliform (No./100 ml) Instantaneous Maximum	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
UV Intensity (µw/cm²) Minimum	2	2.3	2.5	3.4	3.4	4.1	4	4.4	4	3.8	3.7	3.5
UV Intensity (µw/cm²) Average Monthly	3	2.9	3.0	3.9	4.6	5.8	4.7	5.6	4.6	4.4	4.4	4.3
Total Nitrogen (lbs/day) Annual Average											184	
Total Nitrogen (mg/L) Annual Average											24.87	
Ammonia (lbs/day) Average Monthly	< 0.9	< 0.8	< 1.0	< 0.9	< 0.9	< 1.1	< 8	< 1	< 3	< 0.8	< 2	< 4
Ammonia (mg/L) Average Monthly	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 1.4	< 0.2	< 0.57	< 0.10	< 0.5	< 0.80
Total Phosphorus (lbs/day) Annual Average											12	
Total Phosphorus (mg/L) Annual Average											1.65	
Total Copper (lbs/day) Average Quarterly		< 0.04			< 0.055			0.03			< 0.01	
Total Copper (mg/L) Average Quarterly		< 0.01			< 0.01			0.006			< 0.004	

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.89
Latitude 40º 42' 19.00" **Longitude** -79º 41' 38.00"
Wastewater Description: Treated domestic sewage

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)
E. Coli	Report (No./100 ml)	IMAX	-	92a.61

Comments: The TRC limit is not applicable because UV disinfection is utilized.

Monitoring for E. Coli is placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Water Quality-Based Limitations

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
Ammonia Nitrogen (5/01 – 10/31)	8.5	Average Monthly	Previous WQM or WQAM modeling
Total Copper	0.0242	Average Monthly	TMS Ver 1.4
Total Copper	0.0377	Daily Maximum	TMS Ver 1.4

Comments: A seasonal multiplier of "3" is typically applied for ammonia nitrogen. Current WQM 7.0 modeling (attached) did not produce effluent limits for ammonia that were as stringent as the previous limits. Previous summertime limit will remain due to anti-backsliding provisions. Wintertime period for ammonia nitrogen will receive monitoring instead of limits since the WQBEL limit of 25 mg/l, which is close the raw sewage concentration, can be easily met based on utilization of secondary treatment and historical DMR data.

The Toxics Management also recommended monitoring and reporting requirements for total zinc, which will thus be placed in the permit at a monitoring frequency of 1/quarter.

Best Professional Judgment (BPJ) Limitations

Comments: A dissolved oxygen limit of a minimum of 4.0 mg/l and monitoring for total nitrogen and total phosphorus is being placed in the renewed permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Anti-Backsliding

N/A

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
CBOD5	185	295	XXX	25.0	40.0	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	225	335	XXX	30.0	45.0	60	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
UV Intensity (µw/cm²)	XXX	XXX	Report	Report	XXX	XXX	1/day	Measured
Total Nitrogen	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Ammonia Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite

Outfall 001 , Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia May 1 - Oct 31	63.0	XXX	XXX	8.5	XXX	17	1/week	24-Hr Composite
Total Phosphorus	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Copper (ug/l)	0.18	0.28 Daily Max	XXX	24.2	37.7	60.4	2/month	24-Hr Composite
Total Zinc	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite

Compliance Sampling Location: Outfall 001 (after disinfection)

Other Comments:

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
18F	42557	BUFFALO CREEK	**3.420**	778.00	167.65	0.00000	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	0.043	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	8.30	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
Buffalo Twp MA	PA0221449	0.8900	0.0000	0.0000	0.000	20.00	6.30

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	8.24	0.00	0.00
NH3-N	25.00	0.10	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
18F	42557	BUFFALO CREEK	**0.001**	745.00	171.00	0.00000	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	0.043	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	8.30	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
18F	42557	BUFFALO 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												
3.420	7.21	0.00	7.21	1.3768	0.00183	.794	51.77	65.17	0.21	1.001	20.00	7.07
Q1-10 Flow												
3.420	4.61	0.00	4.61	1.3768	0.00183	NA	NA	NA	0.17	1.224	20.00	6.92
Q30-10 Flow												
3.420	9.80	0.00	9.80	1.3768	0.00183	NA	NA	NA	0.24	0.863	20.00	7.18

WQM 7.0 Modeling Specifications

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

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
18F	42557	BUFFALO 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
3.420	Buffalo Twp MA	17.85	50	17.85	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
3.420	Buffalo Twp MA	1.74	13.42	1.74	13.42	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)		
3.42	Buffalo Twp MA	25	25	13.42	13.42	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18F	42557	BUFFALO CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
3.420	0.890	20.000	7.073
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
51.768	0.794	65.168	0.209
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.69	0.793	2.24	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.563	3.626	Tsivoglou	6
Reach Travel Time (days)			
1.001			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.100	5.25	2.08	6.93
0.200	4.85	1.94	6.56
0.300	4.48	1.81	6.39
0.400	4.14	1.69	6.33
0.500	3.83	1.57	6.36
0.600	3.53	1.47	6.44
0.701	3.26	1.37	6.55
0.801	3.02	1.28	6.68
0.901	2.79	1.19	6.81
1.001	2.57	1.11	6.95

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
18F	42557	BUFFALO 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)
3.420	Buffalo Twp MA	PA0221449	0.890	CBOD5	25		
				NH3-N	13.42	26.84	
				Dissolved Oxygen			4

Buffalo Township Muni Auth STP
Buffalo Township, Butler County
PA0221449 Discharge pH

Outfall 001

Date	pH min	pH max	10^ -pH min	10^ -pH max	& pH max)	-Log (Ave pH)
Jul-21	6.2	6.8	6.31E-07	1.58E-07	3.95E-07	**6.4**
Aug-21	6.02	6.95	9.55E-07	1.12E-07	5.34E-07	**6.3**
Sep-21	6.07	6.96	8.51E-07	1.1E-07	4.8E-07	**6.3**
Jul-22	6.0	6.8	0.000001	1.58E-07	5.79E-07	**6.2**
Aug-22	6.16	6.75	6.92E-07	1.78E-07	4.35E-07	**6.4**
Sep-22	6.04	6.71	9.12E-07	1.95E-07	5.53E-07	**6.3**
Jul-23	6.05	6.52	8.91E-07	3.02E-07	5.97E-07	**6.2**
Aug-23	6.03	6.58	9.33E-07	2.63E-07	5.98E-07	**6.2**
Sep-23	6.0	6.47	0.000001	3.39E-07	6.69E-07	**6.2**
					Median:	**6.3**

	Facility:	Buffalo Township MA STP											
	NPDES #:	PA0221449											
	Outfall No:	001											
	n (Samples/Month):	4											
	Reviewer/Permit Engineer:	A. Pesek											
Parameter Name	Total Copper												
Units	µg/L												
Detection Limit	4												
Sample Date	*When entering values below the detection limit, enter "ND" or use the < notation (eg. <0.02)*												
1/1/2020	20												
4/1/2020	12												
7/1/2020	20												
10/1/2020	16												
1/1/2021	ND												
4/1/2021	18.3												
7/1/2021	15												
10/1/2021	12												
1/1/2022	10												
4/1/2022	13												
7/1/2022	ND												
10/1/2022	ND												
1/1/2023	6												
4/1/2023	10												
7/1/2023	10												

Reviewer/Permit Engineer: A. Pesek

Facility: Buffalo Township MA STP
NPDES #: PA0221449
Outfall No: 001
n (Samples/Month): 4

Parameter	Distribution Applied	Coefficient of Variation (daily)	Avg. Monthly
Total Copper (µg/L)	Delta-Lognormal	0.5019452	19.7307282

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **Buffalo Township MA STP** NPDES Permit No.: **PA0221449** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Treated Domestic Sewage**

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
0.89	100	6.3						

					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		518									
	Chloride (PWS)	mg/L		175									
	Bromide	mg/L	<	0.1									
	Sulfate (PWS)	mg/L		36.5									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L		19.73			0.5019						
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L		70.5									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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

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

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Buffalo Township MA STP, NPDES Permit No. PA0221449, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Buffalo Creek**

No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	042557	8	778	167.65			Yes
End of Reach 1	042122	0.001	755	11410		4	Yes

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

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	8	0.043										108	8.3		
End of Reach 1	0.001	0.043	2390									100	7		

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	8														
End of Reach 1	0.001														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Buffalo Township MA STP, NPDES Permit No. PA0221449, 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)
8	7.21		7.21	1.377	0.00054	0.826	55.046	66.638	0.189	2.589	167.121
0.001	2390.00	6.188	2383.812								

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)
8	41.76		41.76	1.377	0.00054	1.681	55.046	32.753	0.466	1.048	76.553
0.001	6663.595	6.188	6657.41								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.300 Analysis Hardness (mg/l): 104.89 Analysis pH: 6.70

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	
Total Copper	0	0		0	14.057	14.6	37.6	Chem Translator of 0.96 applied
Total Lead	0	0		0	68.021	86.8	223	Chem Translator of 0.784 applied
Total Zinc	0	0		0	122.013	125	320	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 106.72 Analysis pH: 7.07

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	
Total Copper	0	0		0	9.467	9.86	61.5	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.701	3.46	21.6	Chem Translator of 0.782 applied
Total Zinc	0	0		0	124.829	127	789	Chem Translator of 0.986 applied

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

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	#########	WQC applied at RMI 0.001 with a design stream flow of 2390 cfs
Chloride (PWS)	0	0		0	250,000	250,000	#########	WQC applied at RMI 0.001 with a design stream flow of 2390 cfs
Sulfate (PWS)	0	0		0	250,000	250,000	#########	WQC applied at RMI 0.001 with a design stream flow of 2390 cfs
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 76.553 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	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	0.18	0.28	24.2	37.7	60.4	µg/L	24.2	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	205	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)	868,436	mg/L	Discharge Conc ≤ 10% WQBEL
Chloride (PWS)	434,218	mg/L	Discharge Conc ≤ 10% WQBEL

Bromide	N/A	N/A	No WQS
Sulfate (PWS)	434,218	mg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	N/A	N/A	Discharge Conc < TQL