Pennsylvania Department of Environmental Protection

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0103331**
Facility Type	**Municipal**	APS ID	**1110812**
Major / Minor	**Minor**	Authorization ID	**1479280**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Jackson Center Borough**	Facility Name	**Jackson Center Borough STP**
Applicant Address	PO Box 38, 1229 Franklin Road	Facility Address	Bradley Road
	Jackson Center, PA 16133-0038		Jackson Center, PA 16133
Applicant Contact	John Chlpka, Borough Council President (dschiestle@yahoo.com)	Facility Contact	Marvin McAfoose, Plant Operator (mcafoose92@hotmail.com)
Applicant Phone	(724) 269-5150	Facility Phone	(724) 699-4070
Client ID	215678	Site ID	257765
Ch 94 Load Status	Not Overloaded	Municipality	Jackson Center Borough
Connection Status	No Limitations	County	Mercer
Date Application Received	March 14, 2024	EPA Waived?	Yes
Date Application Accepted	April 4, 2024	If No, Reason	-
Purpose of Application	Renewal of an NPDES Permit for an existing discharge of treated sanitary wastewater from a municipal sewer system.		

Summary of Review

Act 14 - Proof of Notification was submitted and received.

A Part II Water Quality Management permit is not required at this time.

The Permittee should be able to meet the limits of this permit, which will protect the uses of the receiving stream.

I. OTHER REQUIREMENTS:

A. Stormwater into sewers
B. Right of way
C. Solids handling
D. Effluent Chlorine Optimization and Minimization

SPECIAL CONDITIONS:

II. Solids Management

There are no open violations in efacts for Client ID (215678) as of 3/17/2025.

Approve	Deny	Signatures	Date
X		Stephen A. McCauley Stephen A. McCauley, E.I.T. / Project Manager	3/17/2025
		 Adam Olesnanik, P.E. / Environmental Engineer Manager	Okay to Draft JCD 3/17/2025

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.098
Latitude	41º 16' 8.90"	Longitude	-80º 9' 6.00"
Quad Name	-	Quad Code	-
Wastewater Description:	Effluent		
Receiving Waters	Yellow Creek (TSF)	Stream Code	35778
NHD Com ID	130029546	RMI	3.4
Drainage Area	15.2	Yield (cfs/mi^2)	0.06
Q_{7-10} Flow (cfs)	0.912	Q_{7-10} Basis	Coolspring Creek @ Mercer (Partial Gage)
Elevation (ft)	1272	Slope (ft/ft)	0.00378
Watershed No.	20-A	Chapter 93 Class.	TSF
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	Pending	Name	

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

Nearest Downstream Public Water Supply Intake	Beaver Falls Municipal Authority - Eastvale		
PWS Waters	Beaver River	Flow at Intake (cfs)	561
PWS RMI	3.5	Distance from Outfall (mi)	45.0

* - The receiving stream is impaired by Aluminum, Iron, Manganese, due to Abandoned Mine Drainage (AMD). Per the SOP, monitoring for those parameters will be included with this renewal, as was done in the previous permit.

Sludge use and disposal description and location(s): Sludge is hauled to the Franklin WWTP.

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.

Narrative: This Fact Sheet details the determination of draft NPDES permit limits for an existing discharge of 0.098 MGD of treated sewage from an existing Publicly Owned Treatment Works (POTW) in Jackson Center Borough, Mercer County.

Treatment permitted under WQM Permit 4397408 consists of the following: A bar screen, a 20,000 gallon equalization tank, a flow control box, a 50,000 gallon aeration basin, two 24,000 gallon final clarifiers, and hypochlorite disinfection with a contact tank. Sludge is processed with an 8,000 gallon aerated sludge holding tank.

Treatment permitted under WQM Permit 4397408 A-1 (issued 10/2/2023) permits the following: A comminutor and perforated screen with auger, an influent pumping wet well (pump station), a two-basin sequencing batch reactor (SBR), two aerobic digesters, two parallel, open-channel, UV units, and an effluent aeration tank.

The proposed hydraulic treatment capacity of the new plant will remain at the current 0.098 MGD limit. Since the flow is not changing, no changes to the limits are necessary. The construction of the new facility is expected to begin around January 2025 and be 100% complete around June 2026. The new facility will begin operation, receiving and treating influent, in the month or two prior to the 100% completion date.

1. Streamflow:

Yellow Creek at Outfall 001:

Drainage Area:	15.2	sq. mi.	(USGS StreamStats)
Yieldrate:	0.06	cfsm	(previous Fact Sheet - Coolspring Creek @ Mercer)
% of stream allocated:	100%	Basis:	No nearby discharges
Q_{7-10}:	0.91	Cfs	(Calculated)

2. Wasteflow:

Maximum discharge: 0.098 MGD = 0.15 cfs

Runoff flow period: 24 hours Basis: Runoff flow for municipal STPs

The calculated stream flow (Q7-10) is greater than 3 times the permitted discharge flow. In accordance with the SOP, the treatment requirements in document number 391-2000-014, titled, “Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers”, dated April 12, 2008, will not be evaluated with this renewal.

Flow will be required to be monitored as authorized under Chapter 92a.61, and as recommended in the SOP.

3. Parameters:

The following parameters were evaluated: pH, Total Suspended Solids, Fecal Coliform, E. Coli, Total Phosphorus, Total Nitrogen, NH_3-N, $CBOD_5$, Dissolved Oxygen, and Disinfection.

a. pH

Between 6.0 and 9.0 at all times

Basis: Application of Chapter 93.7 technology-based limits.

The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the “Technical Guidance for the Development and Specification of Effluent Limitations” (362-0400-001), which will be retained.

b. Total Suspended Solids

Limits are 30.0 mg/l as a monthly average and 60.0 as an instantaneous maximum.

Basis: Application of Chapter 92a47 technology-based limits

c. Fecal Coliform

05/01 - 09/30:	200/100ml	(monthly average geometric mean)
	1,000/100ml	(instantaneous maximum)
10/01 - 04/30:	2,000/100ml	(monthly average geometric mean)
	10,000/100ml	(instantaneous maximum)

Basis: Application of Chapter 92a47 technology-based limits

d. E. Coli

Monitoring was added for E. Coli at a frequency of 1/quarter.

Basis: Application of Chapter 92a.61 as recommended by the SOP for flows greater than 0.05 MGD and less than 1.0 MGD.

e. Total Phosphorus

Chapter 96.5 does not apply. Therefore, the previous monitoring for Total Phosphorus will be retained in accordance with the SOP, based on Chapter 92a.61.

f. Total Nitrogen

The previous monitoring for Total Nitrogen will be retained in accordance with the SOP, based on Chapter 92a.61.

g. Ammonia-Nitrogen (NH_3-N)

Median discharge pH to be used:	7.1	Standard Units (S.U.)
		Basis: eDMR data from previous 12 months
Discharge temperature:	25°C	(default value used in the absence of data)
Median stream pH to be used:	7.0	Standard Units (S.U.)
		Basis: default value used in the absence of data
Stream Temperature:	25˚C	(default value used for TSF modeling)
Background NH_3-N concentration:	0.0	mg/l
		Basis: Default value
Calculated NH_3-N Summer limits:	12.5	mg/l (monthly average)
	25.0	mg/l (instantaneous maximum)
Calculated NH_3-N Winter limits:	25.0	mg/l (monthly average)
	50.0	mg/l (instantaneous maximum)

Result: WQ modeling resulted in the summer NH3-N limits above (see Attachment 1). The winter limits are calculated as three times the summer limits, but since the technology-based limits would govern, they will be used. The previous permit limits are more restrictive and are being met, so they will be retained.

h. $CBOD_5$

Median discharge pH to be used: 7.1 Standard Units (S.U.)

Basis: eDMR data from previous 12 months

Discharge temperature: 25°C (default value used in the absence of data)

Median stream pH to be used: 7.0 Standard Units (S.U.)

Basis: default value used in the absence of data

Stream Temperature: 25˚C (default value used for TSF modeling)

Background $CBOD_5$ concentration: 2.0 mg/l

Basis: Default value

Calculated $CBOD_5$ limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Result: WQ modeling resulted in the calculated CBOD5 limits above (see Attachment 1). These limits are the same as the previous permit and will be retained.

i. Influent Total Suspended Solids and BOD_5

Monitoring for these two parameters will be retained as recommended in the SOP for POTWs, as authorized under Chapter 92a.61.

j. Dissolved Oxygen (DO)

The technology-based minimum of 4.0 mg/l is recommended by the WQ Model (see Attachment 1) and the SOP based on Chapter 93.7, under the authority of Chapter 92a.61. This limit is the same as the previous permit and will be retained.

The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001), which will be retained.

k. Disinfection

☐ Ultraviolet (UV) light monitoring

☒ Total Residual Chlorine (TRC) limits: 0.5 mg/l (monthly average)
1.6 mg/l (instantaneous maximum)

Basis: The technology-based TRC limits above were calculated using the Department's TRC Calculation Spreadsheet (see Attachment 2). The limits are the same as the previous NPDES Permit and will be retained.

The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001), which will be retained.

4. Reasonable Potential Analysis for Receiving Stream:

A Reasonable Potential Analysis was performed in accordance with State practices for Outfall 001 using the Department's Toxics Management Spreadsheet (see Attachment 3).

Result: Reasonable potential was calculated for the following parameters:

Parameter	Max. Discharge Conc. (mg/l)	WQBEL (mg/l)	%WQBEL
Total Copper	0.04	0.063	>50%
Total Zinc	0.132	0.54	>10%
Total Iron	0.881	10.5	<10%

Per the SOP, since the maximum discharge concentration for Total Copper was greater than 50% of the calculated WQBEL, a limit will be required. The calculated WQBEL for Total Copper is 0.063 mg/l. The limit in the previous permit was 0.048 mg/l, which the permittee is attaining, so it will be retained with this renewal.

Since the maximum discharge concentration for Total Zinc was greater than 10% of the calculated WQBEL, 1/month monitoring will be added with this renewal.

Since the maximum discharge concentration for Total Iron was less than 10% of the calculated WQBEL, the previous limit for Total Iron of 10.5 mg/l was removed from with this renewal. However, since the receiving stream is impaired by AMD metals, including Total Iron, quarterly monitoring for Total Iron will be added with this renewal.

5. Reasonable Potential for Downstream Public Water Supply (PWS):

The Department's Toxics Management Spreadsheet does not calculate limits for parameters that are based on PWS criteria (TDS, Chloride, Bromide, and Sulfate).

Nearest Downstream potable water supply (PWS): Beaver Falls Municipal Authority - Eastvale
Distance downstream from the point of discharge: 45.0 miles (approximate)

Result: No limits or monitoring are necessary as significant dilution is available.

6. Flow Information:

The Jackson Center Borough receives 50% of its flow from the borough. The remaining 50% of its flow comes from the Jackson Township. Both municipal sewer systems are separate.

7. Anti-Backsliding:

Since all the permit limits in this renewal, except for Total Iron, are the same or more restrictive than the previous NPDES Permit, anti-backsliding is not applicable.

Based on the sampling data that is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance (40 CFR §122.44(l)(i)(B)(1)), the previous limits for Total Iron were removed and quarterly monitoring was added instead.

8. Attachment List:

Attachment 1 - WQ Modeling Printouts

Attachment 2 - TRC_Calc Spreadsheet

Attachment 3 - Toxics Management Spreadsheet

(The Attachments above can be found at the end of this document)

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	0.03784	0.04239	0.03601	0.03454	0.03036	0.03333	0.02291	0.0297	0.03213	0.04757	0.04212	0.03186
Flow (MGD) Daily Maximum	0.05713	0.07916	0.04722	0.04461	0.03508	0.05912	0.04803	0.03441	0.03495	0.08109	0.0512	0.05849
pH (S.U.) Instantaneous Minimum	7.0	6.9	6.9	6.9	6.9	6.9	7.0	6.9	7.0	7.0	7.1	7.1
pH (S.U.) Instantaneous Maximum	7.2	7.2	7.2	7.1	7.2	7.2	7.3	7.2	7.2	7.2	7.2	7.2
DO (mg/L) Instantaneous Minimum	5.78	5.68	5.42	5.44	7.09	6.1	5.17	5.09	5.01	6.2	5.68	6.75
TRC (mg/L) Average Monthly	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3
TRC (mg/L) Instantaneous Maximum	0.59	0.56	0.52	0.61	0.55	0.53	0.59	0.57	0.62	0.57	0.59	0.51
CBOD5 (lbs/day) Average Monthly	3.2	< 1.9	1.6	< 3.1	< 1.0	1.4	1.5	0.7	< 2.9	7.2	2.3	12.5
CBOD5 (lbs/day) Weekly Average	3.2	< 1.5	1.6	5.5	< 1.0	1.4	2.6	0.7	4.9	13.7	3.1	16.3
CBOD5 (mg/L) Average Monthly	17.3	< 4.6	5.2	< 5.6	< 3.0	6.7	6.7	3.6	< 9.3	12.0	11.0	49.0
CBOD5 (mg/L) Weekly Average	23.8	6.4	5.2	8.76	3.27	6.73	7.2	3.67	15.0	19.4	14.0	73.6
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	64	147	114	228	101	50	110	< 51	88	73	124	< 73
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	78	210	169	233	104	51	194	67	101	85	193	< 106
BOD5 (mg/L) Raw Sewage Influent Average Monthly	368	307.3	312.6	607.8	308.9	284.2	445	< 265.5	301.3	290.4	581	< 295.5
TSS (lbs/day) Average Monthly	6.9	5.7	4.6	< 2.5	7.0	< 1.1	< 1.1	< 1.0	5.1	9.3	2.8	17.8
TSS (lbs/day) Raw Sewage Influent Average Monthly	60	81	47	124	41	33	79	54	64	63	56	68

TSS (lbs/day) Raw Sewage Influent Daily Maximum	78	133	47	172	49	42	136	59	77	70	62	91
TSS (lbs/day) Weekly Average	6.9	4.4	4.6	< 3.1	7.0	< 1.1	< 1.8	< 1.0	6.2	17.6	4.2	25.2
TSS (mg/L) Average Monthly	35.0	13.5	15.0	< 6.0	21.5	< 5.0	< 5.0	< 5.0	17.0	17.0	13.0	72.0
TSS (mg/L) Raw Sewage Influent Average Monthly	339	162	144	280	130	166	340	279	221	263	283	226
TSS (mg/L) Weekly Average	60.0	19.0	15.0	7.0	24.0	< 5.0	< 5.0	5.0	19.0	25.0	18.0	114.0
Fecal Coliform (No./100 ml) Geometric Mean	< 23	< 2	< 1	< 1	< 19	< 1	< 2	< 1	< 1	< 1	< 3	2048
Fecal Coliform (No./100 ml) Instantaneous Maximum	517	6	< 1	< 1	358	< 1	5	< 1	< 1	< 1	9	2420
Total Nitrogen (lbs/day) Average Quarterly		5			4			3			0.4	
Total Nitrogen (mg/L) Average Quarterly		13.02			13.1			7.93			7.31	
Ammonia (lbs/day) Average Monthly	0.5	2.5	0.9	< 0.5	0.4	0.2	< 0.09	0.8	0.9	2.2	0.7	1.3
Ammonia (mg/L) Average Monthly	2.338	5.16	2.67	< 1.41	1.11	0.979	< 0.4	3.82	2.65	8.26	3.67	4.57
Total Phosphorus (lbs/day) Average Quarterly		3.22			0.5			0.4			0.05	
Total Phosphorus (mg/L) Average Quarterly		2.16			1.7			1			0.93	
Total Aluminum (lbs/day) Average Quarterly		0.01			0.01			0.06			5	
Total Aluminum (mg/L) Average Quarterly		0.031			0.047			0.158			0.101	
Total Copper (lbs/day) Average Monthly	< 0.0009	< 0.003	0.004	0.003	0.002	0.002	< 0.001	< 0.001	< 0.002	< 0.002	< 0.001	0.002
Total Copper (mg/L) Average Monthly	< 0.005	< 0.007	0.011	0.007	0.005	0.009	< 0.005	< 0.005	< 0.006	< 0.006	< 0.006	0.006
Total Iron (lbs/day) Average Monthly	0.1	0.2	0.2	0.793	0.3	0.2	0.1	0.1	0.3	0.3	0.1	0.4
Total Iron (mg/L) Average Monthly	0.639	0.465	0.731	0.679	0.881	0.719	0.397	0.486	0.879	0.507	0.513	1.24
Total Manganese (lbs/day) Average Quarterly		0.05			0.06			0.04			0.01	
Total Manganese (mg/L) Average Quarterly		0.134			0.194			0.094			0.22	

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 Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.2	1/day	Grab
CBOD5	21.0	33.0	XXX	25.0	40.0	50	2/month	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	24-Hr Composite
TSS	25.0	37.0	XXX	30.0	45.0	60	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Total Nitrogen	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Ammonia Nov 1 - Apr 30	21.0	XXX	XXX	25.0	XXX	50	2/month	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	7.0	XXX	XXX	8.5	XXX	17	2/month	24-Hr Composite
Total Phosphorus	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Aluminum	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Copper	0.039	XXX	XXX	0.048	XXX	0.12	2/month	24-Hr Composite
Total Iron	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Manganese	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Zinc	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite

Compliance Sampling Location: Outfall 001, after disinfection.

Flow is monitor only based on Chapter 92a.61. The limits for pH and Dissolved Oxygen are technology-based on Chapter 93.7. The limits for Total Residual Chlorine (TRC) are technology-based on Chapter 92a.48. The limits for $CBOD_5$, Total Suspended Solids, and Fecal Coliforms are technology-based on Chapter 92a.47. Monitoring for influent BOD5 and TSS is based on Chapter 92a.61. The limits for Ammonia-Nitrogen are water quality-based on Chapter 93.7. The limits for Total Copper and Total Zinc are water quality-based on Chapter 16. Monitoring for Total Nitrogen, Total Phosphorus, Total Aluminum, Total Iron, Total Manganese, and Total Zinc is based on Chapter 92a.61.

Attachment 1

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20A	35778	YELLOW 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)
3.400	Jackson Ctr	PA0103331	0.098	CBOD5	25		
				NH3-N	12.5	25	
				Dissolved Oxygen			4

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20A	35778	YELLOW CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
3.400	0.098	25.000	7.013
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
17.174	0.530	32.388	0.117
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.28	0.614	1.78	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.035	4.733	Tsivoglou	5
Reach Travel Time (days)			
1.204			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.120	4.81	1.57	6.37
0.241	4.38	1.39	6.12
0.361	3.99	1.23	6.09
0.481	3.64	1.09	6.19
0.602	3.32	0.96	6.33
0.722	3.02	0.85	6.50
0.842	2.75	0.75	6.67
0.963	2.51	0.66	6.83
1.083	2.29	0.58	6.98
1.204	2.08	0.52	7.12

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		

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
20A	35778	YELLOW CREEK	**3.400**	1240.00	15.20	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	0.060	0.00	0.00	0.000	0.000	0.0	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
Jackson Ctr	PA0103331	0.0980	0.0000	0.0000	0.000	25.00	7.10

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	7.54	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
20A	35778	YELLOW CREEK	1.100	1194.00	21.10	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	0.060	0.00	0.00	0.000	0.000	0.0	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
		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
20A	35778	YELLOW 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												
3.400	0.91	0.00	0.91	.1516	0.00379	.53	17.17	32.39	0.12	1.204	25.00	7.01
Q1-10 Flow												
3.400	0.58	0.00	0.58	.1516	0.00379	NA	NA	NA	0.09	1.480	25.00	7.02
Q30-10 Flow												
3.400	1.24	0.00	1.24	.1516	0.00379	NA	NA	NA	0.14	1.035	25.00	7.01

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20A	35778	YELLOW 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
3.400	Jackson Ctr	10.89	50	10.89	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
3.400	Jackson Ctr	1.36	12.5	1.36	12.5	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)		
3.40	Jackson Ctr	25	25	12.5	12.5	4	4	0	0

Attachment 2

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.91	= Q stream (cfs)	0.5	= CV Daily
0.098	= Q discharge (MGD)	0.5	= CV Hourly
30	= 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)
0	= % Factor of Safety (FOS)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 1.934	1.3.2.iii	WLA cfc = 1.878
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.721	5.1d	LTA_cfc = 1.092

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...** **...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...** **...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**

Attachment 3

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **Jackson Center Boro** NPDES Permit No.: **PA0103331** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **POTW 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
0.098	100	7.1						

	Discharge Pollutant	Units	Max Discharge Conc		0 if left blank: Trib Conc	0 if left blank: Stream Conc	0.5 if left blank: Daily CV	0.5 if left blank: Hourly CV	0 if left blank: Strea m CV	0 if left blank: Fate Coeff	0 if left blank: FOS	1 if left blank: Criteri a Mod	1 if left blank: Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		2260									
	Chloride (PWS)	mg/L											
	Bromide	mg/L	<										
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	mg/L		0.158									
	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	mg/L		0.04									
	Free Cyanide	µg/L	<										
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	mg/L		0.881									
	Total Lead	mg/L		0.002									
	Total Manganese	mg/L		0.194									
	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	mg/L		0.132									
	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

Jackson Center Boro, NPDES Permit No. PA0103331, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Yellow 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	035778	3.4	1240	15.2			Yes
End of Reach 1	035778	1.1	1194	21.1			Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	3.4	0.06										100	7		
End of Reach 1	1.1	0.06										100	7		

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	3.4														
End of Reach 1	1.1														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Jackson Center Boro, NPDES Permit No. PA0103331, 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)
3.4	0.91		0.91	0.152	0.004	0.53	17.174	32.388	0.117	1.204	12.507
1.1	1.27		1.266								

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)
3.4	6.86		6.86	0.152	0.004	1.215	17.174	14.13	0.336	0.419	4.692
1.1	9.131		9.13								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 12.507 PMF: 1 Analysis Hardness (mg/l): 100 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	
Total Aluminum	0	0		0	750	750	5,262	
Total Copper	0	0		0	13.439	14.0	98.2	Chem Translator of 0.96 applied
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	64.581	81.6	573	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	117.180	120	841	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 12.507 PMF: 1 Analysis Hardness (mg/l): 100 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	

Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	8.956	9.33	65.4	Chem Translator of 0.96 applied
Total Iron	0	0		0	1,500	1,500	10,523	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.517	3.18	22.3	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	118.139	120	841	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 12.507 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	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	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	1,000	1,000	7,016	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 4.692 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	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	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 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	0.051	0.08	0.063	0.098	0.16	mg/L	0.063	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Zinc	Report	Report	Report	Report	Report	mg/L	0.54	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
Total Aluminum	3.37	mg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	10.5	mg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	0.022	mg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	7.02	mg/L	Discharge Conc ≤ 10% WQBEL