pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0020656**
Facility Type	**Municipal**	APS ID	**1055562**
Major / Minor	**Minor**	Authorization ID	**1383043**

Applicant and Facility Information

Applicant Name	**Newell Borough Municipal Authority Sewage Treatment Plant**	Facility Name	**Newell Borough Municipal Authority**
Applicant Address	413 Second Street	Facility Address	413 Second Street
	Newell, PA 15466-0356		Newell, PA 15466-0356
Applicant Contact	Ron Krepps	Facility Contact	Same as applicant
Applicant Phone	(729) 938-8822	Facility Phone	Same as applicant
Client ID	37562	Site ID	254838
Ch 94 Load Status	Not Overloaded	Municipality	Newell Borough
Connection Status		County	Fayette
Date Application Received	January 24, 2022	EPA Waived?	Yes
Date Application Accepted	January 31, 2022	If No, Reason	

Purpose of Application: Application for renewal of NPDES permit for treated sewage

Summary of Review

The permittee has applied for a renewal of NPDES Permit No. PA0020656. The current permit was issued on June 8, 2017 and will expire on June 30, 2022.

Sewage from this facility is treated with:

- Contact tanks
- Reaeration basins
- Sedimentation basins
- Aerobic digestors
- Chlorine contact tanks

The applicant is currently enrolled in and will continue to use eDMR.

The Act 14-PL 834 Municipal Notification was provided by the December 27, 2021 letters and no comments were received.

More stringent mass loading limitations for TSS have been applied during this permit cycle. *E. Coli* monitoring has also been imposed. All sample types that were previously 8-hour composite samples have been updated to 24-hour composite samples in accordance with Department SOP “New and Reissuance Sewage Individual NPDES Permit Applications” (BCW-PMT-002).

Approve	Deny	Signatures	Date
X		Grace Polakoski Grace Polakoski, E.I.T. / Environmental Engineering Specialist	February 17, 2022
X		Mahbuba Iasmin Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineer Manager	April 21, 2022

Summary of Review
Sludge use and disposal description and location(s): other WWTP (Dalton's Service Co., LLC) 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)	0.1
Latitude	40º 04' 42"	Longitude	-79º 53' 53"
Quad Name	California	Quad Code	40079A8
Wastewater Description:	Sewage Effluent		
Receiving Waters	Monongahela River (WWF)	Stream Code	37185
NHD Com ID	99410698	RMI	50.67
Drainage Area	5160 sq. mi.	Yield (cfs/mi^2)	0.105
Q_{7-10} Flow (cfs)	540	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	744	Slope (ft/ft)	
Watershed No.	19-C	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	POLYCHLORINATED BIPHENYLS (PCBS)		
Source(s) of Impairment	SOURCE UNKNOWN		
TMDL Status	Final	Name	Monongahela River TMDL

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

Nearest Downstream Public Water Supply Intake	Municipal Authoring of Washington Township		
PWS Waters		Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	4.7

Changes Since Last Permit Issuance:

Other Comments:

Monongahela River TMDL
A TMDL for the Monongahela watershed was approved on March 1, 1999 for the control of PCBs and chlordane. This TMDL applies to the portion of the Monongahela River between the Point Marion Lock and Dam (RMI 90.8) and the Grays Landing Lock and Dam (RMI 82.0). In accordance with 40 CFR § 122.44(d)(1)(vii)(B), 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 wasteload allocation (WLA) for the discharge prepared by the State and approved by the EPA pursuant to 40 CFR § 130.7. The Newell Borough Municipal Authority was not assigned wasteload allocations for PCBs or chlordane.

Treatment Facility Summary				
Treatment Facility Name: Newell STP				
WQM Permit No.	**Issuance Date**			
N/A	N/A			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Gas Chlorine	0.05
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.1	175	Not Overloaded	Dewatering	Other WWTP

Changes Since Last Permit Issuance: N/A

Other Comments:

Compliance History

Facility: Newell Borough Municipal Authority STP

NPDES Permit No.: PA0020656

Compliance Review Period: 2/2017 – 2/2022

Inspection Summary:

INSP ID	INSPECTED DATE	INSP TYPE	AGENCY	INSPECTION RESULT DESC
3010387	03/04/2020	Compliance Evaluation	PA Dept of Environmental Protection	Violation(s) Noted
2660312	10/19/2017	Routine/Partial Inspection	PA Dept of Environmental Protection	No Violations Noted

Violation Summary:

VIOL ID	VIOLATION DATE	VIOLATION TYPE	VIOLATION TYPE DESC	RESOLVED DATE
880032	03/04/2020	92A.44	NPDES - Violation of effluent limits in Part A of permit	

Open Violations by Client ID: No Clean Water open violations for Client ID 37562

Enforcement Summary: No enforcements

DMR Violation Summary:

MONITORING END DATE	OUTFALL	PARAMETER	STATISTICAL BASE CODE	PERMIT VALUE	SAMPLE VALUE	UNIT OF MEASURE
11/30/2020	1	Fecal Coliform	Instantaneous Maximum	10000	12100	No./100 ml
7/31/2020	1	Fecal Coliform	Instantaneous Maximum	1000	12100	No./100 ml
1/31/2019	1	Total Residual Chlorine (TRC)	Average Monthly	0.5	0.85	mg/L
12/31/2018	1	Total Residual Chlorine (TRC)	Average Monthly	0.5	0.77	mg/L
11/30/2017	1	Total Residual Chlorine (TRC)	Average Monthly	0.5	0.64	mg/L

Compliance Status: Open violation for effluent exceedances. Will inquire about CACP
Completed by: John Murphy
Completed date: 2/1/2022

Other Comments: Violation closed on 2/8/22 by John Murphy

Compliance History

DMR Data for Outfall 001 (from January 1, 2021 to December 31, 2021)

Parameter	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21
Flow (MGD) Average Monthly	0.38	0.30	0.043	0.072	0.043	0.042	0.052	0.052	0.052	0.076	0.032	0.043
Flow (MGD) Daily Maximum	0.062	0.52	0.091	0.102	0.091	0.113	0.099	0.097	0.107	0.117	0.147	0.120
pH (S.U.) Minimum	69.72	6.71	7.10	7.03	7.04	7.01	6.96	6.98	6.66	6.72	6.79	6.24
pH (S.U.) Maximum	7.18	7.26	7.33	7.32	7.38	7.42	7.14	7.24	7.16	7.26	7.42	7.27
DO (mg/L) Minimum	8.15	7.95	5.69	5.79	5.32	7.86	7.11	7.99	7.11	8.36	6.88	5.93
TRC (mg/L) Average Monthly	0.22	0.22	0.21	0.22	0.22	0.18	0.17	0.15	0.16	0.16	0.18	0.17
TRC (mg/L) Instantaneous Maximum	0.27	0.28	0.26	0.27	0.29	0.30	0.21	0.21	0.22	0.34	0.26	0.31
CBOD5 (lbs/day) Average Monthly	1.23	1.06	1.62	2.4	2.31	2.23	1.90	3.36	2.42	5.49	1.81	1.73
CBOD5 (lbs/day) Weekly Average	1.68	1.23	2.16	2.4	4.32	4.20	2.60	5.16	2.58	9.77	2.27	2.16
CBOD5 (mg/L) Average Monthly	3.9	4.2	4.5	4.0	6.4	6.4	4.4	7.8	5.6	8.6	6.7	4.8
CBOD5 (mg/L) Weekly Average	5.3	4.9	6.0	4.0	12.0	12.0	6.1	12.0	6.1	15.5	8.4	6.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	35.9	33.3	33.4	36.2	38.7	56.8	48.6	68.9	50.5	37.4	36.9	45.9
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	51.8	38.3	46.1	39.4	50.8	79.5	106.2	101.9	58.5	75.0	50.0	58.3
BOD5 (mg/L) Raw Sewage Influent Average Monthly	115.8	133.0	92.6	61.4	107.4	162.3	113.1	160.3	117.4	58.7	136.6	127.4
TSS (lbs/day) Average Monthly	1.60	1.25	2.16	2.95	1.80	1.75	1.5	2.15	2.15	3.15	1.35	1.8
TSS (lbs/day) Raw Sewage Influent Average Monthly	14.2	14.2	11.9	10.39	11.4	8.6	18.52	23.8	15.7	43.5	9.4	13.7

TSS (lbs/day) Raw Sewage Influent Daily Maximum	20.2	23.0	18.7	20.7	22.3	13.3	25.8	45.6	20.6	78.8	14.6	18.7
TSS (lbs/day) Weekly Average	1.60	1.25	3.24	2.95	1.80	1.75	1.5	2.15	2.15	3.15	1.35	1.8
TSS (mg/L) Average Monthly	5.0	5.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.01
TSS (mg/L) Raw Sewage Influent Average Monthly	49.4	56.8	33.0	18.0	31.8	24.6	42.4	55.3	36.5	69.1	34.8	38.0
TSS (mg/L) Weekly Average	5.0	5.0	9.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Fecal Coliform (No./100 ml) Geometric Mean	9.24	3.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5
Fecal Coliform (No./100 ml) Instantaneous Maximum	108	10	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5
Ammonia (lbs/day) Average Monthly	0.26	0.2	1.57	0.54	0.63	1.95	1.49	1.79	1.53	1.17	0.083	1.17
Ammonia (mg/L) Average Monthly	0.8	0.80	4.4	0.92	1.77	5.58	3.46	4.18	3.56	1.85	3.24	3.26

Other Comments: as confirmed during a phone call between the Operator and DEP Staff on 4/12/22, there is an error in eDMR data for December of 2021, where some numbers are greater than the actual data by a factor of 10

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.1
Latitude 40º 04' 42.00" **Longitude** -79º 53' 53.00"
Wastewater Description: Sewage Effluent

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)

Water Quality-Based Limitations

The discharge was evaluated using WQM7.0 to evaluate the $CBOD_5$, ammonia nitrogen, and dissolved oxygen parameters. The modeling results show technology-based effluent limitations for these parameters are appropriate. Per DEP SOP "Establishing Effluent Limitations for Individual Sewage Permits" (Rev. March 34, 2021, BCW-PMT-033), when WQM7.0 indicates that a summer limit of 25 mg/L for ammonia nitrogen is acceptable, a year-round monitoring requirement for ammonia-nitrogen will be established, at a minimum.

The discharge was evaluated using the Total Residual Chlorine spreadsheet (TRC_CALC). The modeling results confirm that a total residual chlorine limit is necessary to meet the in-stream water quality criterion. The TRC spreadsheet recommended a limit of 0.5 mg/L, which complies with regulatory standards under §§92a.47(a)(8) and 92a.48(b).

Parameter	Limit (mg/l)	SBC	Model
Dissolved Oxygen	4	Minimum	WQM7.0
Ammonia Nitrogen (May 1 – Oct 31)	25	Average Monthly	WQM7.0
Total Residual Chlorine	0.5	Average Monthly	TRC_CALC

Best Professional Judgment (BPJ) Limitations

A Dissolved Oxygen minimum limitation of 4.0 mg/L will be implemented based on the standard in 25 PA Code Chapter 93 and best professional judgment.

Anti-Backsliding

Section 402(o) of the Clean Water Act (CWA), enacted in the Water Quality Act of 1987, establishes anti-backsliding rules governing two situations. The first situation occurs when a permittee seeks to revise a Technology-Based effluent limitation based on BPJ to reflect a subsequently promulgated effluent guideline which is less stringent. The second situation

addressed by Section 402(o) arises when a permittee seeks relaxation of an effluent limitation which is based upon a State treatment standard of water quality standard.

Previous limits can be used pursuant to EPA's anti-backsliding regulation 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). (2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.**

The facility is not seeking to revise the previously permitted effluent limits.

Mass Loading Limitations

Per Department SOP "Establishing Effluent Limitations for Individual Sewage Permits" (BCW-PMT-033), mass loading limits will be established for POTWs for $CBOD_5$, TSS, ammonia nitrogen. Average monthly mass loading limits will be established for $CBOD_5$, TSS, and ammonia nitrogen. Average weekly mass loading limits will be established for $CBOD_5$ and TSS. Mass loading limits will be calculated according to the formula below:

$$average\ annual\ design\ flow\ (MGD) \times concentration\ limit\ \left(\frac{mg}{L}\right) \times 8.34\ (converstion\ factor)$$
$$= mass\ loading\ limit\ (\frac{lbs}{day})$$

The following mass loading limitations were calculated:

Parameter	Average Monthly (lbs/day)	Average Weekly (lbs/day)
$CBOD_5$	20.85	33.36
TSS	25.02	37.53
Ammonia Nitrogen	20.85	-

However, in the previous permit cycle, the average monthly mass loading limits for $CBOD_5$ and TSS and average weekly mass loading limits for TSS were more stringent. The more stringent limits will be applied in this permit cycle to comply with the Department's anti-backsliding policy.

Influent Monitoring

Per Department SOP "New and Reissuance Sewage Individual NPDES Permit Applications" (BCW-PMT-002), POTWs with design flows greater than 2,000 GPD, influent BOD_5 and TSS monitoring will be established in the permit. The influent monitoring will be established with the same frequency and sample type as the effluent sampling.

Total Dissolved Solids (TDS) Analysis

Effluent testing data was provided in the application and was entered into the Department's Toxic Management Spreadsheet. The standard DEP default total hardness value of 100 mg/L was used. The model determined that no effluent limitations are required.

Additional Considerations

Sewage discharges will include monitoring, at a minimum, for *E. coli*, in new and reissued permits, with a monitoring frequency of 1/quarter for design flows >= 0.05 and < 1 MGD.

The receiving stream is not impaired for nutrients, therefore, annual sampling for nitrogen and phosphorus will be imposed per 25 PA Code §92.61b.

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Department's Technical Guidance for the Development and Specification of Effluent Limitations.

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" (362-0400-001), 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	Average Monthly	Weekly Average	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
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	0.5	XXX	XXX	1.6	1/day	Grab
CBOD5	20.85	31.3	25.0	37.5	XXX	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	Report	XXX	XXX	XXX	1/week	24-Hr Composite
TSS	25.0	37.5	30.0	45.0	XXX	60	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	Report	XXX	XXX	XXX	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
Total Nitrogen	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Ammonia	Report	XXX	XXX	Report Avg Mo	Report Daily Max	XXX	1/week	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab

Compliance Sampling Location: Outfall 001

APPENDIX A:
USGS StreamStats Report

StreamStats Report

Region ID: PA
Workspace ID: PA20220201185724372000
Clicked Point (Latitude, Longitude): 40.07860, -79.89899
Time: 2022-02-01 13:57:49 -0500

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	5160	square miles
ELEV	Mean Basin Elevation	1850	feet

Low-Flow Statistics Parameters [99.9 Percent (5160 square miles) Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5160	square miles	2.26	1400

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
ELEV	Mean Basin Elevation	1850	feet	1050	2580

Low-Flow Statistics Disclaimers [99.9 Percent (5160 square miles) Low Flow Region 4]

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

Low-Flow Statistics Flow Report [99.9 Percent (5160 square miles) Low Flow Region 4]

Statistic	Value	Unit
7 Day 2 Year Low Flow	684	ft^3/s
30 Day 2 Year Low Flow	908	ft^3/s
7 Day 10 Year Low Flow	397	ft^3/s
30 Day 10 Year Low Flow	466	ft^3/s
90 Day 10 Year Low Flow	693	ft^3/s

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/)

Application Version: 4.6.2
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

APPENDIX B:
WQM7.0 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
19A	37185	MONONGAHELA RIVER	**50.670**	744.00	5160.00	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	0.105	540.00	0.00	0.000	0.000	0.0	560.00	10.00	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
Newell Boro STP	PA0020656	0.0000	0.0000	0.1000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19A	37185	MONONGAHELA RIVER	**50.570**	743.00	5170.00	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	0.105	540.00	0.00	0.000	0.000	0.0	560.00	10.00	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 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 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
50.670	540.00	0.00	540.00	.1547	0.00189	10	560	56	0.10	0.063	25.00	7.00
Q1-10 Flow												
50.670	345.60	0.00	345.60	.1547	0.00189	NA	NA	NA	0.06	0.099	25.00	7.00
Q30-10 Flow												
50.670	734.40	0.00	734.40	.1547	0.00189	NA	NA	NA	0.13	0.047	25.00	7.00

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
50.670	0.100	5.003	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
560.000	10.000	56.000	0.096
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.01	0.005	0.01	0.221
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
12.508	0.089	O'Connor	5
Reach Travel Time (days)			
0.063			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.006	2.01	0.01	11.45
0.013	2.01	0.01	11.45
0.019	2.01	0.01	11.45
0.025	2.01	0.01	11.45
0.032	2.01	0.01	11.45
0.038	2.01	0.01	11.45
0.044	2.01	0.01	11.45
0.051	2.01	0.01	11.45
0.057	2.01	0.01	11.45
0.063	2.01	0.01	11.45

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
50.670	Newell Boro STP	11.08	50	11.08	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
50.670	Newell Boro STP	1.37	25	1.37	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)		
50.67	Newell Boro STP	25	25	25	25	4	4	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
50.670	Newell Boro STP	PA0020656	0.000	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			4

APPENDIX C:
TRC_CALC Results

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

540	= Q stream (cfs)	0.5	= CV Daily
0.1	= 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)		=Decay Coefficient (K)

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc =	1113.529	1.3.2.iii	WLA cfc =	1085.596
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	414.927	5.1d	LTA_cfc =	631.115

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)**

APPENDIX D:
Toxics Management Spreadsheet Results

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Newell Borough Municipal Authority STP** NPDES Permit No.: **PA0020656** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **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
0.1	100	6.81						

					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		569									
	Chloride (PWS)	mg/L		182									
	Bromide	mg/L		0.103									
	Sulfate (PWS)	mg/L		120									
	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	mg/L	<	0.005									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	mg/L		0.0002									
	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	mg/L		0.035									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										
	Carbon Tetrachloride	µg/L	<										

Group 3	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											

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Newell Borough Municipal Authority STP, NPDES Permit No. PA0020656, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: **Monongahela River**

No. Reaches to Model: 1

◉ Statewide Criteria
○ Great Lakes Criteria
○ ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	037185	50.67	744	5160			Yes
End of Reach 1	037185	50.57	743	5170			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	50.67	0.105				560	10					100	7		
End of Reach 1	50.57	0.105				560	10								

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	50.67														
End of Reach 1	50.57														

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Newell Borough Municipal Authority STP, NPDES Permit No. PA0020656, 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)
50.67	541.80		541.80	0.155	0.002	10.	560.	56.	0.097	0.063	312.157
50.57	542.85		542.85								

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)
50.67	1821.23		1821.23	0.155	0.002	17.046	560.	32.852	0.191	0.032	140.313
50.57	1824.311		1824.31								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.219 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc	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	13.439	14.0	10,761	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	62,763	Chem Translator of 0.791 applied
Total Zinc	0	0		0	117.180	120	92,106	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	

Total Copper	0	0		0	8.956	9.33	32,682	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	11,146	Chem Translator of 0.791 applied
Total Zinc	0	0		0	118.139	120	419,748	Chem Translator of 0.986 applied

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

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	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	
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): ###### 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

Pollutants	*Mass Limits*		*Concentration Limits*				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			

☑ ***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
Total Copper	6.9	mg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	11.1	mg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	59.0	mg/L	Discharge Conc ≤ 10% WQBEL