pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0033766**
Facility Type	**Non-Municipal**	APS ID	**1087673**
Major / Minor	**Minor**	Authorization ID	**1438283**

Applicant and Facility Information

Applicant Name	**Aqua Pennsylvania Wastewater Inc.**	Facility Name	**North Heidelberg Sewer Co. STP**
Applicant Address	762 W Lancaster Avenue Bryn Mawr, PA 19010-3402	Facility Address	255 Koenig Road Bernville, PA 19506
Applicant Contact	Todd Duerr, VP of Production *	Facility Contact	Kyle Roberts, Area Supervisor
Applicant Phone	(610) 792-2112/ TMDuerr@aquaamerica.com	Facility Phone	(610) 520-6384/ KWRoberts@aquaamerica.com
Client ID	62614	Site ID	451889 (PF # 478972)
Ch 94 Load Status		Municipality	Jefferson Township
Connection Status		County	Berks
Date Application Received	May 1, 2023 (transfer) May 3, 2023 (renewal)	EPA Waived?	Yes
Date Application Accepted	May 4, 2023	If No, Reason	
Purpose of Application	Renew NPDES permit in new owner's name		

Summary of Review

The previous NPDES permit for this facility was effective May 1, 2009, with an expiration date of April 30, 2014. A renewal application was received December 3, 2013 from the previous owner, North Heidelberg Sewer Company, allowing the permit to be administratively extended past the stated expiration date of April 30, 2014. After that time, the Pennsylvania Public Utility Commission (PUC) assigned operations of the sewage treatment plant to Aqua PA. At the end of March 2023, Aqua PA became the owner of the Sewage Treatment Plant (STP) and associated conveyance system.

On May 1, 2023, Aqua PA submitted to DEP a transfer permit application via DEP's online upload system (OnBase Reference ID#106523) for the NPDES permit and five WQM permits: 0602411, 0669403, 0601405, 0603401, and 0694411. Transfer fees of $1450 were submitted. On May 3, 2023, Aqua PA submitted to DEP, as requested, a renewal application for the NPDES permit via DEP's online upload system (OnBase Reference ID#106531).

According to the 2023 renewal application, the STP serves a population of 816 with 100% of flow from within Jefferson Township. However, the map of the sewer service area attached to the application indicates that the service area also extends into North Heidelberg Township. (See attached maps.) The DEP 2009 Fact Sheet (FS) associated with the previous permit similarly stated: "The plant currently serves the country club and several subdivisions in Jefferson and North Heidelberg Townships." To ensure compliance with Pennsylvania's Administrative Code, a copy of the draft renewal permit is being sent by DEP to North Heidelberg Township.

* While Todd Duerr was the client contact provided on the NPDES renewal application and the signatory on the transfer application, the following client contact information was provided on the NPDES and WQM transfer applications:
Kyle McCullough, Area Supervisor III
Aqua Pennsylvania Wastewater, Inc.
529 King Road
Royersford, PA 19468
610-792-2112, KRMcCullough@aquaamerica.com

Approve	Deny	Signatures	Date
x		*Bonnie Boylan* Bonnie Boylan / Environmental Engineering Specialist	August 25, 2023
x		*Maria D. Bebenek* for Daniel W. Martin, P.E. / Environmental Engineer Manager	August 28, 2023
x		*Maria D. Bebenek* Maria D. Bebenek, P.E. / Environmental Program Manager	August 28, 2023

Design flow:

The previous permit's limits were based on a design flow of 0.1 MGD. The 2023 NPDES permit renewal application also showed 0.1 MGD as the annual average design flow and 0.1 MGD as the Hydraulic Design Capacity. The past two years of Discharge Monitoring Reports (DMRs) were reviewed (see attached): the average flow has been consistently below 0.1 MGD. Therefore, there is no need to change the effluent flow on which the permit limits are developed.

Industrial Users:

None per 2023 application

Hauled-in Wastes:

None per 2023 application

Combined Sewer Overflows:

Not applicable

Sludge use and/or disposal:

Hauled off-site, to a Publicly Owned Treatment Works (POTW)

Unresolved Violations

There are no outstanding Clean Water Program violations for this facility according to DEP's eFacts database and DEP's WMS 'Open Violations per Client' Report'.

Delaware River Basin Commission (DRBC):

The facility discharges to a stream within the Delaware River watershed and is thus subject to the Delaware River Basin Commission's (DRBC) requirements. A copy of the draft permit and Fact Sheet will therefore be sent to the DRBC for their review in accordance with State regulations and an interagency agreement. Any comments from DRBC will be considered.

DRBC's Interactive Map does not show a wastewater discharge docket for this facility because the map only includes dockets that were issued since 2005. According to DRBC's interactive map, docket D-1992-027-3 was issued March 16, 2016 to Bernville Corporation-Heidelberg Country Club for the renewal of a surface water withdrawal from the Tulpehocken Creek. The surface water withdrawal docket states: "Wastewater is conveyed to the North Heidelberg Sewer Company sewage treatment facility most recently approved by DRBC **Docket D-1994-001 on April 26, 1995**."

History:

According to DEP's eFacts database (which came into use in the mid 1980's), a 'new' NPDES permit was issued to this facility October 31,1993 and renewed multiple times since then.

The Internal Review and Recommendations (IRR) for the WQM permit 0602411, which was issued by DEP June 20, 2003, stated: "The outfall location is being moved from the unnamed tributary, which flows adjacent to the plant, to the Northkill Creek." The WQM permit approved a plant upgrade to 0.10 MGD Annual Average Flow (AAF), 0.10 MGD Design Hydraulic Capacity and 200 lbs. BOD/day Design Organic Capacity.

The renewal NPDES permit issued June 20, 2003 and the NPDES permit amendment issued February 24, 2004 stated that the facility was authorized to discharge to an Unnamed Tributary (UNT) to Northkill Creek and to Northkill Creek. Both permits gave the same latitude / longitude for the discharge at outfall 001: 40° 25' 51" / -76° 06' 58".

The renewal NPDES permit issued April 10, 2009 stated that the facility was authorized to discharge to Northkill Creek and gave the same latitude/longitude as the previous permits. According to the 2009 Fact Sheet (FS) associated with the April 2009 NPDES permit, the discharge is to Northkill Creek at River Mile Index (RMI) 0.43, stream code 1902. The 2009 FS states: "In 2004 the plant was expanded from 0 .05 MGD to 0.10 MGD. The plant currently serves the country club and several subdivisions in Jefferson and North Heidelberg Townships. As a result of the plant serving these subdivisions, the owner has been required to submit Chapter 94 reports and the permit was amended to include mass loadings for TSS, CBOD5, phosphorus and ammonia."

The previous owner of North Heidelberg Sewer Company is deceased. Aqua PA was operating the STP as "Receiver" for North Heidelberg Sewer Company. The Pennsylvania PUC terminated Aqua PA Wastewater's status as receiver, approved them to purchase the wastewater system and provide wastewater service in portions of North Heidelberg and Jefferson Townships, and issued certificate of public convenience, as adopted on October 27, 2022. The closing between North Heidelberg Sewer Company and Aqua PA did not occur until March 31, 2023.

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)	0.10
Latitude	40º 25' 51"	Longitude	
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Northkill Creek	Stream Code	1902
NHD Com ID	25962306/Reach 02040203009149	RMI	0.43
Drainage Area	41.6 sq.mi. (per PA Stream Stats online)	LFY (cfs/mi^2)	0.20 cfs/sq.mi.
Q_{7-10} Flow (cfs)	8.3 cfs (equiv. of 5.36 MGD)	Q_{7-10} Basis	Gage correlation
Elevation (ft)	Approx. 300'	Slope (ft/ft)	
Watershed No.	3-C	Chapter 93 Class.	CWF, MF
Existing Use	None	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired for Recreational Uses – Assessment ID # 18843 and 4963		
Cause(s) of Impairment	Pathogens		
Source(s) of Impairment	unknown		
TMDL Status	None	Name	-

Secondary Waters: Northkill Creek empties into Tulpehocken Creek at RMI 14.9 (WWF per eMapPA) which flows into Blue Marsh Lake (WWF), both of which are also impaired for Recreational Uses due to pathogens. According to the 2022 Integrated Water Quality Report, Blue Marsh Lake is also impaired for aquatic life due to nutrients/organic enrichment from agriculture (assessment ID #3033 & 3034). Tulpehocken Creek, after Blue Marsh Lake, empties into the Schuylkill River at 75.5 RMI which empties into the Delaware River. Both the Schuylkill and the Delaware River are subject to TMDLs for PCBs.

Background/Ambient Data		Data Source – none – no nearby monitoring stations
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Western Berks Water Authority		
PWS Waters	Tulpehocken Creek	Flow at Intake (cfs)	
PWS RMI	Approx. 6	Distance from Outfall (mi)	More than 9

-Qs:Qd ratio = 5.36 MGD : 0.10 MGD = 53:1

-Bernville Borough STP is downstream, at approximately 0.2 RMI on Northkill Creek, PA0024023.

-There is an active DEP Water Quality Network (WQN) network station located downstream on Tulpehocken Creek (WQN 117) but it is nearly 13 miles from North Heidelberg's outfall 001 such that its historic data has not been used for estimating stream background values (for example, pH, Temperature, Hardness).

-Whereas DEP's eMapPA shows this segment of Northkill Creek as having a **designated use** of WWF, the designated use provided in **25 Pa Code §93.9f is 'CWF, MF'** (Cold Water Fishes, Migratory Fishes) for Northkill Creek south of the I78 bridge. (North of the I78 bridge, Northkill Creek is 'EV, MF' (Exceptional Value, Migratory Fishes)

according to 25 Pa Code §93.9f.) Further, Northkill Creek, Tulpehocken Creek, and Blue Marsh Lake are not on a) DEP's Ongoing Stream Redesignation Evaluations Report (last updated 8/11/2023), or b) DEP's Completed Stream Redesignation Evaluations (last updated 7/25/2022) --including the Statewide Class A streams, or c) DEP's Existing Use list (last revised 8/18/2023), or d) DEP's online search for TMDLs.

-the Q7-10 for Northkill Creek at the outfall 001 location was estimated using USGS data for the downstream gage 01470960 (see attached):
31.8 cfs at gage / 175 sq.mi. gage Drainage Area = LFY gage = 0.2 cfs/sq.mi;
0.2 cfs/sq.mi. x 41.6 sq. mi. Drainage Area of Northkill Creek at the outfall 001 location = 8.3 cfs.

PA Stream Stats online tool was also reviewed but it's estimated Q7-10 for Northkill Creek at the outfall 001 location included a large percent error and appeared too low: 2.25 cfs. Northkill Creek empties into the larger Tulpehocken Creek slightly south of the facility's outfall 001 such that limits based on a stream flow of 2.25 cfs would be unnecessarily stringent.

Changes from last permit:

-The 2009 FS used a gage on the Tulpehocken Creek, 01470779, approx. 5 miles before the confluence of Tulpehocken Creek with Northkill Creek to arrive at a larger estimated Q7-10 (18.7 cfs) and LFY (0.451 cfs/sq.mi.) which were used in the models.

-The February 2009 FS did not include Bernville Borough STP's discharge in the modeling.

Treatment Facility Summary

Treatment Facility Name: North Heidelberg STP

WQM Permit No.	Issuance Date
0602411 – STP	6/20/2003
0603401 – PS#3	6/17/2003
0601405 – PS#2	6/18/2001
0694411 – PS#1	8/21/1994 and amended 5/31/2001
0669403**	6/26/1969

**for construction of sanitary sewers and original pump station to serve a recreational complex in Jefferson and N. Heidelberg Townships with an initial population of 332 and a design population of 770, terminating at the Bernville Sewage TP; permit issued by PA Dept. of Health 6/26/1969 and reviewed by Sanitary Water Board during its sessions on 7/16/1969 and 7/17/1969.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia And Phosphorus Reduction	Extended Aeration	Ultraviolet	0.1

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.1	200		Aerobic Digestion	Other WWTP

Attached to this Fact Sheet is a flow diagram that was included with the 2023 NPDES permit renewal application.

PREVIOUS PERMIT LIMITS:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum 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	Continuous	Measured
Influent BOD and Influent TSS	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen (DO)	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Suspended Solids (TSS)	25	40	XXX	30	45	60	1/week	24-Hr Composite
CBOD5	21	33	XXX	25	40	50	1/week	24-Hr Composite
NH3-N Ammonia	16	XXX	XXX	20	XXX	40	1/week	24-Hr Composite
Total Phosphorus	0.83	XXX	XXX	1.0	XXX	2	1/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	XXX	1/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	XXX	1/week	Grab

Compliance History

DMR Data for Outfall 001 (from July 1, 2022 to June 30, 2023)

Parameter	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22
Flow (MGD) Average Monthly	0.049	0.045	0.044	0.066	0.052	0.088	0.09	0.0509	0.041	0.0388	0.046	0.046
Flow (MGD) Daily Maximum	0.115	0.107	0.092	0.191	0.121	0.189	0.251	0.0857	0.09	0.0756	0.072	0.096
pH (S.U.) Minimum	6.2	6.6	6.8	6.8	6.8	6.6	6.8	6.6	7.0	6.8	6.6	6.8
pH (S.U.) Instantaneous Maximum	7.5	7.5	7.8	7.5	7.8	7.5	7.7	7.4	8.6	8.1	7.7	8.9
DO (mg/L) Minimum	7.5	7.8	8.8	8.7	6.3	8.2	7.2	6.4	7.2	8.0	7.2	6.71
CBOD5 (lbs/day) Average Monthly	< 0.9	< 0.8	1	2	2	< 2	< 2	< 1	< 0.6	2	< 1	< 1
CBOD5 (lbs/day) Weekly Average	1	< 1	1	3	2	2	3	2	0.7	2	1	2
CBOD5 (mg/L) Average Monthly	< 3	< 2	3	4	4	< 2	< 3	< 3	< 2	4	< 3	< 3
CBOD5 (mg/L) Weekly Average	4	2	3	5	5	3	4	4	3	5	5	5
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	57	45	66	94	155	79	98	151	66	148	92	98
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	85	54	90	156	290	108	171	216	88	280	127	155
BOD5 (mg/L) Raw Sewage Influent Average Monthly	166	133	194	200	324	127	169	379	270	402	297	291
TSS (lbs/day) Average Monthly	< 3	2	2	5	6	4	8	< 4	0.9	< 1	< 2	2
TSS (lbs/day) Raw Sewage Influent Average Monthly	71	44	72	78	178	52	60	83	68	85	50	88

TSS (lbs/day) Raw Sewage Influent Daily Maximum	143	86	130	140	371	67	95	121	111	123	81	164
TSS (lbs/day) Weekly Average	9	4	3	8	13	10	21	9	1	2	3	2
TSS (mg/L) Average Monthly	< 8	4	6	10	14	6	13	< 10	3	< 3	< 6	5
TSS (mg/L) Raw Sewage Influent Average Monthly	215	121	216	185	360	90	107	195	275	236	153	255
TSS (mg/L) Weekly Average	23	6	9	14	25	11	30	23	5	6	14	9
Fecal Coliform (CFU/100 ml) Geometric Mean	7	< 3	< 3	< 2	< 29	< 5	< 4	4	< 4	< 2	< 3	< 2
Ammonia (lbs/day) Average Monthly	< 0.007	< 0.04	< 0.06	< 0.6	< 0.05	< 0.2	< 0.3	< 4	< 0.005	< 2	< 0.02	< 0.01
Ammonia (mg/L) Average Monthly	< 0.02	< 0.12	< 0.17	< 0.93	< 0.09	< 0.22	< 0.65	< 0.08	< 0.02	< 4.73	< 0.07	< 0.04
Total Phosphorus (lbs/day) Average Monthly	0.20	0.10	0.08	0.10	0.10	0.20	0.20	0.10	0.05	0.10	0.10	0.05
Total Phosphorus (mg/L) Average Monthly	0.45	0.29	0.26	0.26	0.34	0.26	0.32	0.3	0.18	0.26	0.41	0.17

Effluent Non-Compliance since 2019:

Event Start Date	Event End Date	Parameter	Limit Type	Reported Value		Permit Limit	Unit	Sampling Point	Sampling Frequency	Sampling Type	Cause of NC	Corrective Action	External Comments	Internal Comments
05/01/2021	05/31/2021	Total Phosphorus	Average Monthly	1.2	>	1	mg/L	Final Effluent (001)	1/week	24-Hr Composite	Other	Other	Replaced chemical pump with a big size pump.	View/Edit
01/01/2020	01/31/2020	Fecal Coliform	Geometric Mean	2317	>	2000	CFU/100 ml	Final Effluent (001)	1/week	Grab	Equipment malfunction/failure	Equipment repaired	High flows, issue with UV.	View/Edit

Notice of Violations (NOV) since 2019:

6/16/2022 - NOV for TSS and Total Phosphorus exceedances of NPDES permit's Instantaneous Maximum limits

Most Recent DEP Inspections:

7/28/2022 – a power outage occurred on 7/21/2022 and pump station at Golf Circle was non-operational resulting in a Sanitary Sewer Overflow (SSO). A portable 75 kW generator was placed on site but the power was restored before the generator was used. "None of the pump stations connected to North Heidelberg STP currently have back up power."

5/12/2022 – DEP effluent grab samples resulted in exceedances of permit limits for TSS (124 mg/l) and Total Phosphorus (3.7 mg/l).

4/14/2022 – DEP effluent grab samples resulted in exceedances of permit limits for TSS (237 mg/l) and Total Phosphorus (6.2 mg/l).

9/21/2021 – follow-up from 9/8/2021 inspection. Following equipment has been replaced: blower motors, generator, Ultraviolet (UV) unit. Aeration tank blowers are operational.

9/8/2021 – extensive damage to treatment plant from flooding related to Hurricane Ida. Aqua installed frac tanks on site and was pumping untreated sewage from Equalization Tank to frac tanks with alarms for temporary disposal at other STP's. New blower motors will be needed. Control building was damaged and a culvert collapsed. Plant generator was damaged. Also installing new UV unit (which is oversized for plant) and coordinating with DEP.

9/2/2021 – STP is flooded and not accessible, due to Hurricane Ida. All treatment units are offline.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.10
Latitude 40º 25' 51" **Longitude** -76º 6' 58"
Wastewater Description: Sewage Effluent

As applicable, Technology-Based Effluent Limitations, Best Professional Judgment Limitations, and Water-Quality Based Effluent Limitations are developed independently and compared. The more stringent limitation is generally imposed while also considering the prohibition on backsliding of permit limits [Title 40 of the Code of Federal Regulations (C.F.R) § 122.44(l) and 25 Pa. Code § 92a.44].

Technology-Based Effluent Limitations (TBELs)

The following technology-based limitations were considered:

Pollutant	Limit (mg/l)	Statistical Base Code	Federal Regulation	State Regulation	DRBC 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) [a]	
Total Suspended Solids (TSS)	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)	
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2) [a]	
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	92a.47(a)(7) and 95.2(1)	18 CFR Part 410
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geometric Mean	-	92a.47(a)(4)	18 CFR Part 410
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	Instant. Maximum	-	92a.47(a)(4)	
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geometric Mean	-	92a.47(a)(5)	
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	Instant. Maximum	-	92a.47(a)(5)	
BOD_5	Secondary Treatment as a minimum	-			18 CFR Part 410 3.10.4 A.
Ammonia	20	Average Monthly	-	-	18 CFR Part 410
Total Dissolved Solids	1000 [b]	Average Monthly	-	-	18 CFR Part 410
Total Dissolved Solids	2000 [c]	Average Monthly		95.10	
Total Phosphorus	2.0 [d]	Average Monthly		96.5	

[a] the TBELs stipulated in Chapter 92a.47(a)(2) and (a)(3) for Publicly Owned Treatment Works (POTWs) can be applied to non-POTWs as performance standards/best professional judgment limitations.

[b] 1000 mg/l as a monthly average unless the permittee submits a Total Dissolved Solids (TDS) Determination to DRBC and DRBC approves a different effluent limit for TDS, such as after a demonstration that the discharge will not cause an in-stream TDS concentration of 133% over background concentration.

[c] 2000 mg/l as a monthly average for new dischargers or for expanding discharge loadings of TDS greater than 5,000 lbs/day, measured as an average daily discharge over the course of a calendar year, since August 21, 2010—unless a variance from DEP is granted

[d] applicable if the receiving water is impaired for nutrients

Except for BOD_5, TDS and Total Phosphorus, the TBELs in the above table match the previous permit limits and have been carried forward into the draft renewal permit.

BOD_5:

Whereas DRBC's effluent limits are for the parameter BOD_5, DEP's effluent limits for sewage discharges are generally imposed for $CBOD_5$ instead: the model that DEP uses includes $CBOD_5$ (not BOD_5). The previous permit also imposed limits on $CBOD_5$ and not on BOD_5 in accordance with Pa Code § 92a.47(a):

> *§ 92a.47. Sewage permit.*
>
> *(a) Sewage, except that discharged from a CSO that is in compliance with subsection (b), or as provided for in subsections (f)—(i), shall be given a minimum of secondary treatment. Secondary treatment for sewage is that treatment that includes significant biological treatment and accomplishes the following:*
> *(1) Monthly average discharge limitation for BOD_5 and TSS may not exceed 30 milligrams per liter. If $CBOD_5$ is specified instead of BOD_5 the limitation may not exceed 25 milligrams per liter.*

TDS:

Because the facility is not expanding nor has the TDS load from the facility increased by greater than 5000 lbs/day since August 21, 2010, the TBEL of 2000 mg/l—based on State regulations--is not applicable.

Because only two effluent sample results for TDS are available at this time (621 mg/l and 603 mg/l in lab result pages attached to the 2023 application), it cannot be determined if the facility is consistently below the average monthly limit of 1000 mg/l –based on DRBC regulations--or could cause in-stream TDS concentrations of 133% over background. A monitoring requirement for TDS has therefore been added to the permit.

Total Phosphorus (TP):

See the section below, BPJ Limitations.

Best Professional Judgment (BPJ) Limitations

Total Phosphorus (TP):

As a result of a 1987 DEP study of the Blue Marsh Reservoir, it was recommended that a phosphorus limit of 1.0 mg/l be included in sewage permits for facilities which discharge upstream of the reservoir. The limits of 1.0 mg/l as a monthly average and 2.0 mg/l as an instantaneous maximum are considered TBELS-BPJ: technologically achievable limits imposed as Best Professional Judgement. The previous permit included TP limits of 1.0 mg/l as a monthly average, 2.0 mg/l as an Instantaneous Maximum, and 0.83 lbs/day as a monthly average mass load limit. The previous permit's limits will be carried forward to continue to protect the Blue Marsh Reservoir.

Dissolved Oxygen (D.O.):

To achieve the water quality criteria for D.O and avoid backsliding, the minimum limit of 5.0 mg/l for D.O. in the previous permit has been carried forward.

Water Quality-Based Effluent Limitations (WQBELs)

TMDL:

Whereas no TMDL exists for the receiving water at this time, the downstream Blue Marsh Lake is considered impaired for aquatic life due to nutrients and is used as a public water supply. As previously discussed, permit limits have been imposed for Total Phosphorus to reduce nutrients into the Lake.

$CBOD_5$ and Ammonia:

DEP uses a model called WQM 7.0 to calculate WQBELs for these parameters. Input values for the model simulation were as follows:

pH of stream = 7.0 s.u., a default value because there is no site-specific data available
Temperature of stream = 20°C, a default value (for CWF and/or Trout Stocked Fishes TSF designated use) because there is no site-specific data available
pH of discharge = 7.0 s.u., assumed
Temperature of discharge = 25°C, assumed
Low Flow Yield = 0.20 cfs/sq.mi, as described on page 4 of the Fact Sheet
Drainage area of Northkill Creek at outfall 001 according to USGS's Pa Streamstats online tool = 41.6 sq.mi. (see Fact Sheet attachment)
Drainage area of Northkill Creek at downstream Bernville Borough STP's outfall according to USGS's Pa Streamstats online tool = 42 sq.mi. (see Fact Sheet attachment)
Drainage area of Northkill Creek at downstream confluence with Tulpehocken Creek according to USGS's Pa Streamstats online tool = 42 sq.mi. (see Fact Sheet attachment)
River Mile Indices and elevations of outfall 001, Bernville Borough STP's outfall, and the confluence between Northkill Creek and Tulpehocken Creek are according to DEP's eMapPA online tool

Because the Bernville Borough Sewage Treatment Plant (STP) is located downstream of this facility, at approximately 0.2 RMI on Northkill Creek, discharging to the same receiving water segment, it was modeled along with the North Heidelberg STP. Bernville Borough STP's NPDES permit (PA0024023) authorizes it to discharge 0.285 MGD.

The model input and output pages are attached to this Fact Sheet. In this case, the model defaulted to the TBELs, signifying that more stringent limits are not needed to protect the receiving waterway. The TBELs were imposed as limits in the draft permit. The $CBOD_5$ and Ammonia limits have not changed from the previous permit's limits.

TOXIC POLLUTANTS:

The following limitations were determined through water quality modeling and Reasonable Potential to exceed an in-stream criteria analysis:

Parameter	Limit (mg/l)	Statistical Base Code (SBC)	Model
None	none	-	Toxics Management Spreadsheet (TMS)

DEP used to use a model called PENTOX. The Toxics Management Spreadsheet (TMS) is a macro-enabled Excel binary file that combines the functions of the former PENTOX model and the former Toxics Screening Analysis spreadsheet to evaluate the reasonable potential for discharges to cause excursions above water quality standards and to determine Water Quality-Based Effluent Limitations (WQBELs) as needed. (Note: Unlike the WQM 7.0 model, TMS only analyzes for single dischargers to a single stream segment.)

The model will recommend a limit where the effluent concentration equals or exceeds 50% of the WQBEL (deemed a demonstration of Reasonable Potential to exceed water quality criteria in a receiving stream). The model will recommend a monitoring requirement where the effluent concentration is between 25% and 50% of the WQBEL for non-conservative pollutants. The model will recommend a monitoring requirement where the effluent concentration is between 10% and 50% of the WQBEL for conservative pollutants. [Standard Operating Procedure (SOP): Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers, Version 1.5, May 20, 2021.]

Because there is no site-specific data available in this case, the following defaults were used in the model:
pH stream = 7.0 s.u.
Hardness stream = 100 mg/l

Other defaults used:
pH discharge = 7.0 s.u.
Hardness discharge = 100 mg/l

The TMS simulation pages are attached to the FS showing input values and results. No WQBELs were indicated.

The TMS recommended monitoring, but no limit, for Total Thallium based on the fact that the maximum concentration reported in the discharge, <3 ug/l, was greater than 10% of the calculated WQBEL of 13.1 ug/l. However, there was only one effluent sample result in the application for Total Thallium and it was "non-detect". The lab reporting level used (also

called the Quantitation Level) was larger than DEP's Target Quantitation Level (TQL), causing the recommendation to require monitoring in the permit for Total Thallium. (The instructions to the Minor Sewage NPDES Permit application do not include a TQL for Total Thallium, meaning it was not a case of the applicant not following the application instructions. DEP's TQL for Total Thallium appears in the Major Sewage NPDES Permit application: 2.0 ug/l.)

At the permit writer's discretion and based on the available data, monitoring has not been included as a permit requirement. The permit writer notes that a) the discharge concentration of <3 ug/l is less than 50% of the WQBEL and therefore reasonable potential is not indicated, b) the TQL of 2.0 ug/l for Total Thallium is also greater than 10% of the WQBEL (13.1 ug/l) calculated by the TMS for Total Thallium, and c) there are no industrial users indicated in the application and no reason to suspect that Thallium is a pollutant of concern.

Mass Loading Limits

The mass loading limits for $CBOD_5$, TSS, Ammonia, and Total Phosphorus were carried forward from the previous permit since the concentration limits and design flow have not changed.

Anti-Backsliding

No limits have been made less stringent from the previous permit.

Monitoring

In accordance with 25 Pa Code § 92a.61, monitoring for UV, Total Nitrogen and its components Total Kjeldahl Nitrogen and Nitrate-Nitrite, and for E. Coli have been included in the draft renewal permit. In the case of nitrogen, DEP is gathering information to assess nutrients in Pennsylvania streams. In the case of E. Coli, the latest revision to Pennsylvania's Water Quality Standards, 25 Pa Code Chapter 93, added a water quality criteria for E. Coli. which has prompted the new monitoring requirement in NPDES sewage permits. A minimum monitoring frequency of quarterly for E. Coli. has been added to the draft permit consistent with DEP's SOP Establishing Effluent Limitations for Individual Sewage Permits, Version 1.9, March 24, 2021.

The new monitoring requirement for TDS has already been discussed in the Fact Sheet.

The monitoring requirements for Flow are the same as the previous permit and as those imposed in other NPDES sewage permits for facilities of this size.

The monitoring requirements for influent BOD_5 and influent TSS are the same as the previous permit and consistent with DEP's SOP: New and Reissuance Individual Sewage NPDES Permits.

Minimum monitoring frequencies are based on DEP's Technical Guidance for the Development and Specification of Effluent Limitations [document #362-0400-001], BPJ, and/or carried forward from the previous permit.

TDS Baseline

In order to apply the requirements in Pa Code § 95.10 in the future, i.e. if the facility proposes an expansion, a TDS Baseline as of August 21, 2010 should be documented. However, the 2009 renewal application did not include sampling results for TDS, nor was monitoring for TDS required by the previous permit. The 2009 renewal application indicated 0.032 MGD as the "Existing annual average flow for the previous year". The 2023 renewal application includes two effluent sample results for TDS, with 621 mg/l as a maximum and 612 mg/l as an average. If the TDS concentration had been similar in 2009, the estimated TDS baseline as of August 2010 would be: 0.032 MGD x 612 mg/l TDS x 8.34 c.f. = 163 lbs/day

The current TDS load is calculated as: 0.05 MGD average flow (from July 1, 2021-June 30, 2023 DMRs, summarized in attachment to this Fact Sheet) x 612 mg/l TDS x 8.34 c.f. = 259 lbs/day.

Class A Wild Trout Fisheries

No Class A Wild Trout Fisheries are impacted by this discharge.

Antidegradation

The effluent limits for this discharge have been developed to ensure that existing in-stream uses and the level of water quality necessary to protect the existing uses are maintained and protected. No High Quality Water or Exceptional Value Waters are impacted by this discharge.

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 as needed and BPJ. Instantaneous Maximum (IMAX) limits are generally 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*)		Concentrations (mg/L*)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly*	Weekly Average*	Instant. Minimum	Average Monthly*	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen (DO)	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
UV Light Intensity (uw/cm^2)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	21	33	XXX	25	40	50	1/week	24-Hr Composite
Biochemical Oxygen Demand (BOD_5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Suspended Solids (TSS)	25	40	XXX	30	45	60	1/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Dissolved Solids (TDS)	XXX	XXX	XXX	Report Avg. Qrtrly.	XXX	XXX	1/quarter	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10,000	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
Ammonia - Nitrogen	16	XXX	XXX	20	XXX	40	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*)		Concentrations (mg/L*)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly*	Weekly Average*	Instant. Minimum	Average Monthly*	Weekly Average	Instant. Maximum		
Nitrate-Nitrite as N	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Kjeldahl Nitrogen	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Nitrogen	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Calculation
Total Phosphorus	0.83	XXX	XXX	1.0	XXX	2	1/week	24-Hr Composite

*****unless otherwise indicated

Compliance Sampling Location: at Outfall 001

Note: Some DEP document ID numbers for Technical Guidance are changing/have changed. See next page for revised numbers.

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☒	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☒	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☒	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: New and Reissuance Sewage Individual NPDES Permit Applications, Version 2.0, February 3, 2022
☒	SOP: Establishing Effluent Limitations in Individual Sewage NPDES Permits, version 1.9, March 24, 2021
☒	SOP: Establishing Water-Quality Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers. Version 1.5, May 20, 2021
☐	Other:

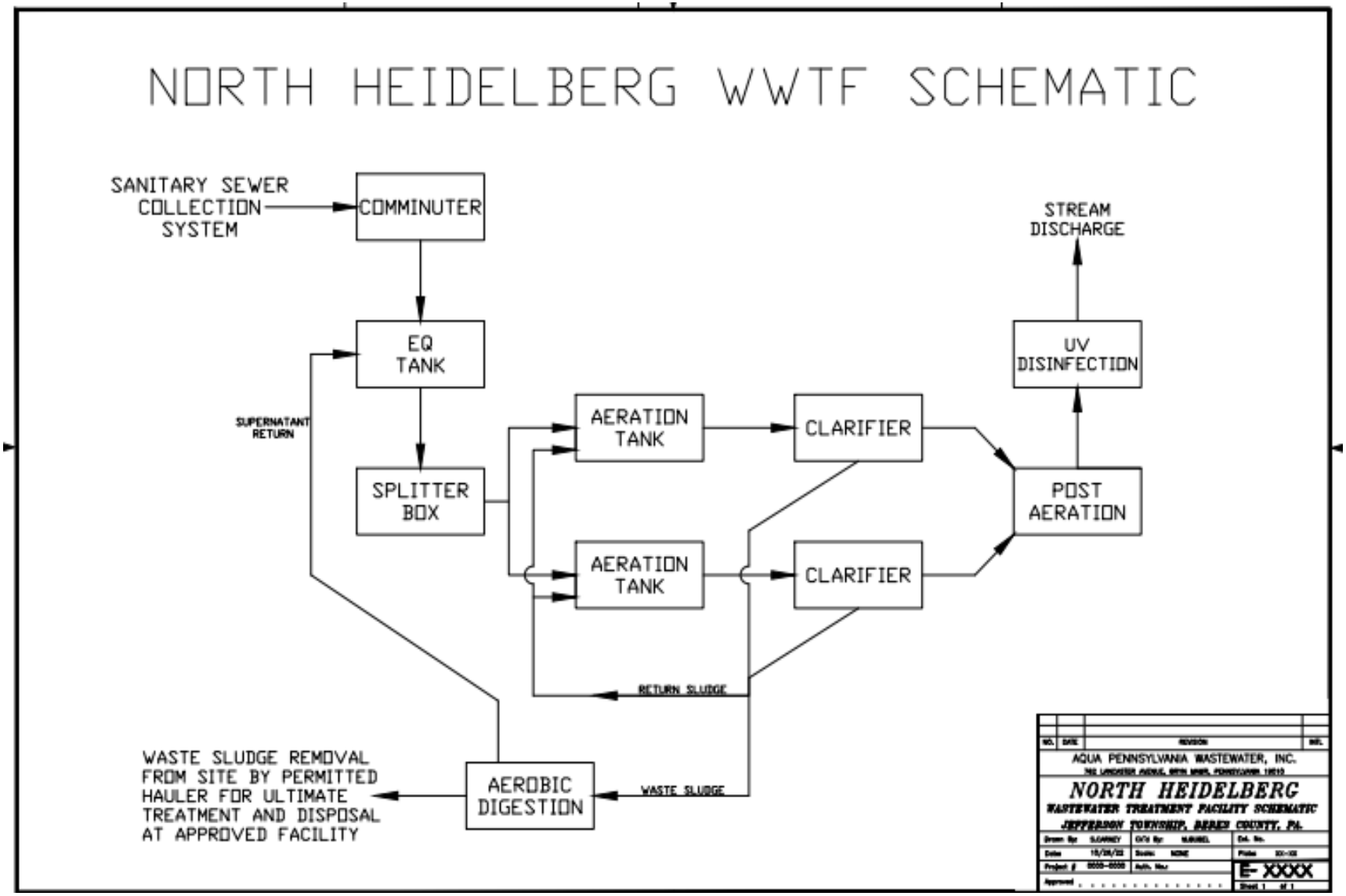
Current Doc ID No.	New Doc ID No.	Publish Date	Type	Name	Current Folder	New Folder
391-2000-017	386-2000-001	4/11/09	G	Implementation Guidance For Temperature Criteria	Water Standards and Facility Regulation	Clean Water
385-2000-011	386-2000-002	9/6/2008	G	Pennsylvania Combined Sewer Overflow (CSO) Policy	Point and Nonpoint Source Management	Clean Water
385-0810-001	386-0810-001	8/21/10	P	Chapter 95 – Total Dissolved Solids, Statement of Policy Defining the Term "Authorization"	Water Standards and Facility Regulation	Clean Water
391-2000-023	386-2000-003	9/14/98	G	Design Stream Flows	Water Supply and Wastewater Management	Clean Water
391-2000-003	386-2000-004	12/9/1997	G	Determining Water Quality Based Effluent Limits	Water Supply and Wastewater Management	Clean Water
391-2000-021	386-2000-005	3/22/99	G	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness	Water Supply and Wastewater Management	Clean Water
391-2000-024	386-2000-006	10/13/98	G	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Coefficients of Variation (CV) and Other Discharge Characteristics	Water Supply and Wastewater Management	Clean Water
391-2000-006	386-2000-007	9/15/97	G	Implementation Guidance Design Conditions	Water Supply and Wastewater Management	Clean Water
391-2000-002	386-2000-008	4/7/97	G	Implementation Guidance Evaluation & Process Thermal Discharge (316 (a)) Federal Water Pollution Act	Water Supply and Wastewater Management	Clean Water
391-2000-010	386-2000-009	3/30/99	G	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments	Water Supply and Wastewater Management	Clean Water

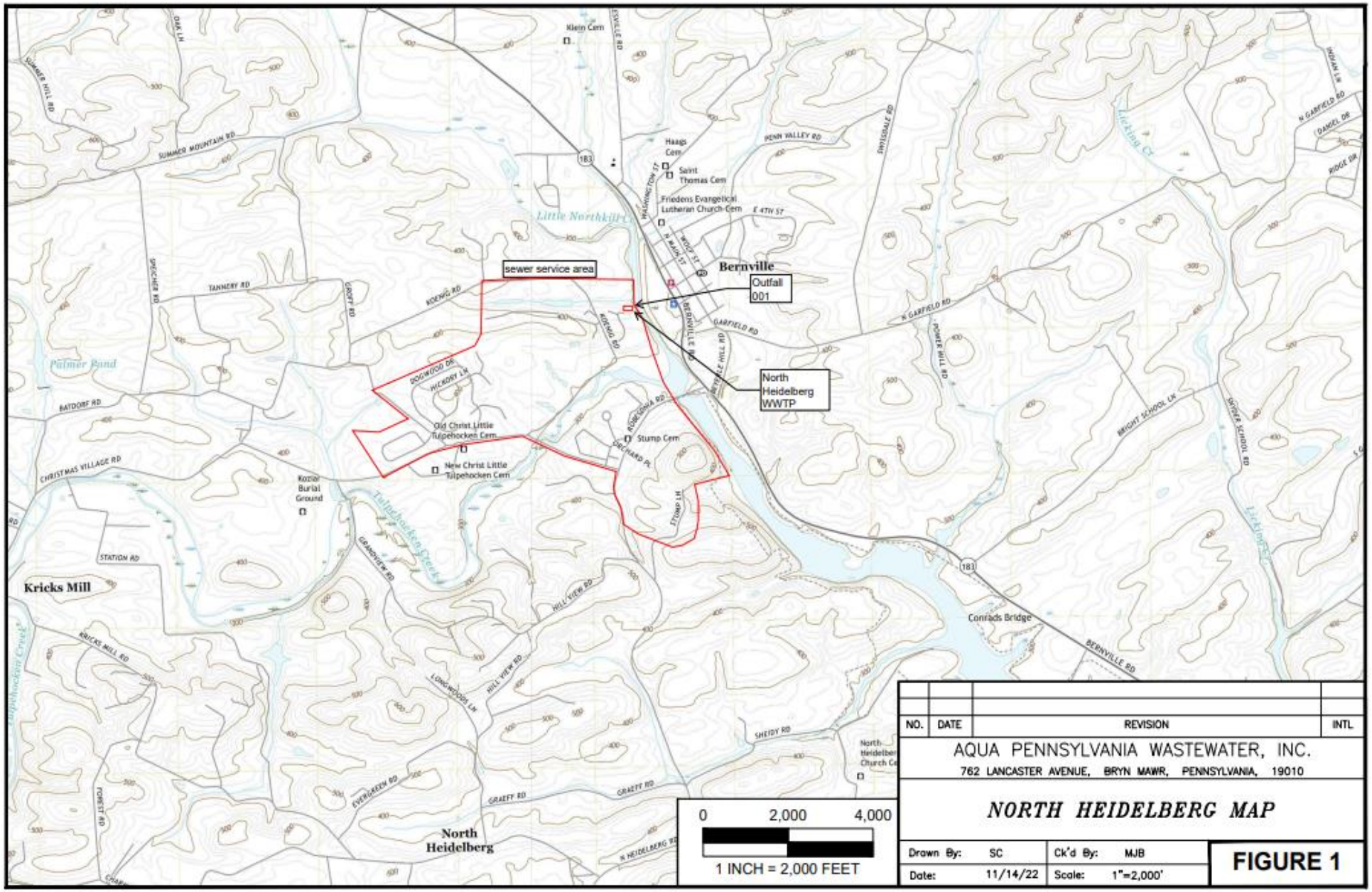
391-2000-022	386-2000-010	3/22/99	G	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances	Water Supply and Wastewater Management	Clean Water
391-2000-015	386-2000-011	11/15/94	G	Implementation Guidance Total Residual Chlorine (TRC) Regulation	Water Supply and Wastewater Management	Clean Water
362-0300-004	386-0300-002	10/1/97	G	Industrial Wastewater Management	Water Supply and Wastewater Management	Clean Water
391-2000-008	386-2000-012	10/24/97	G	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges	Water Supply and Wastewater Management	Clean Water
391-2000-014	386-2000-013	4/12/08	G	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers	Water Standards and Facility Regulation	Clean Water
391-2000-020	386-2000-014	9/7/95	G	Protocol for Estimating First Order Pollutant Fate Coefficients for Volatile Organic Substances	Water Supply and Wastewater Management	Clean Water
391-2000-011	386-2000-015	5/22/04	G	Technical Reference Guide (TRG) PENTOXSD for Windows PA Single Discharge Wasteload Allocation Program for Toxics Version 2.0	Water Supply and Wastewater Management	Clean Water
391-2000-007	386-2000-016	6/26/04	G	Technical Reference Guide (TRG) WQM 7.0 for Windows Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen Version 1.0	Water Supply and Wastewater Management	Clean Water
362-2000-001	386-2000-017	?	G	Permitting Policy and Procedure Manual	Water Quality	Clean Water

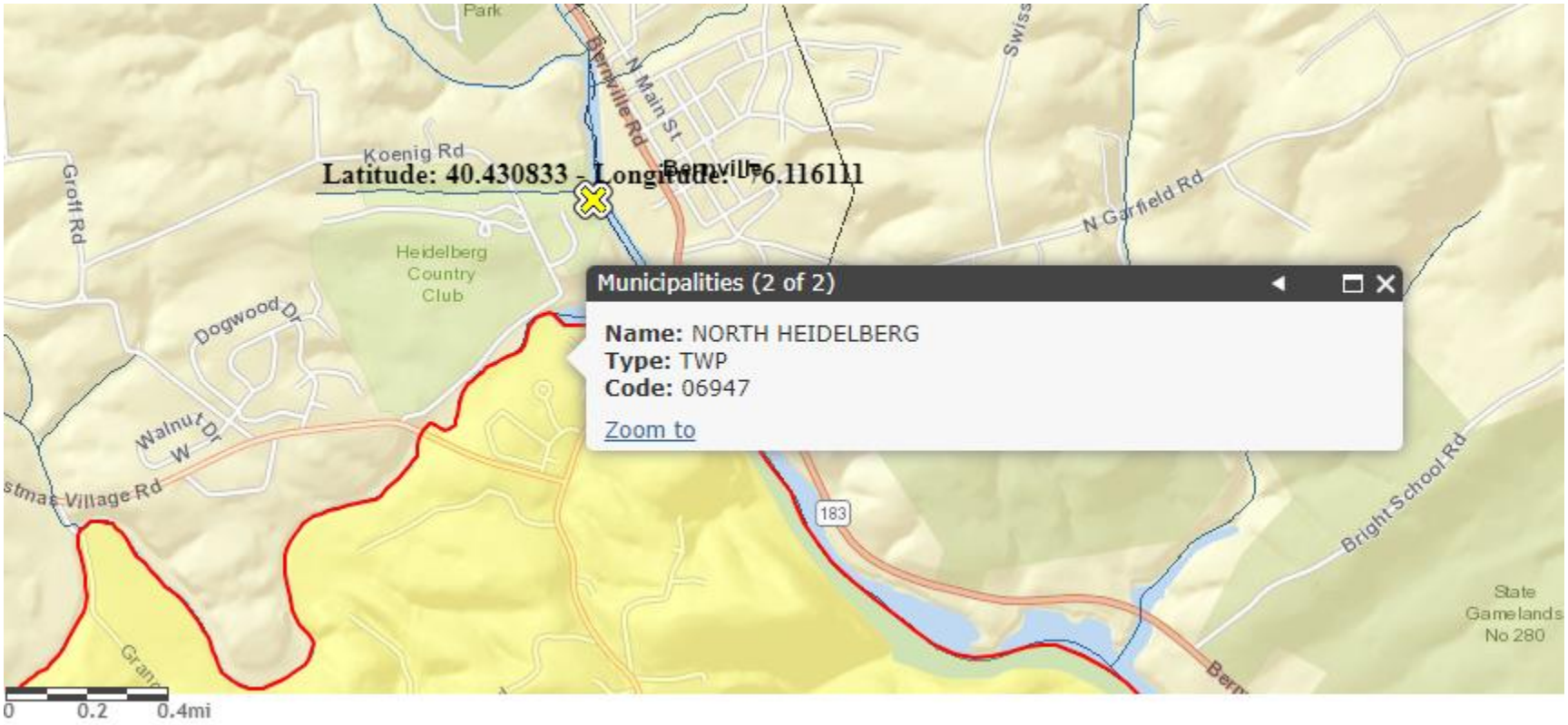
362-0400-001	386-0400-001	10/1/1997	G	Technical Guidance for the Development and Specification of Effluent Limitations	Water Quality	Clean Water
362-2183-003	386-2183-001	10/1/1997	G	Technology Based Control Requirements for Water Treatment Plant Wastes	Water Quality	Clean Water
362-2000-008	386-2000-018	11/1/1996	G	Policy for Conducting Technical Reviews of Minor NPDES Permit Applications	Water Quality	Clean Water
362-2000-003	386-2000-019	3/1/1998	G	Policy for Permitting Surface Water Diversions	Water Quality	Clean Water
362-2183-004	386-2183-002	12/1/1997	G	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry	Water Quality	Clean Water
391-2000-019	386-2000-020	10/28/1997	G	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids (TDS), Nitrite-Nitrate (NO2-NO3), Non-Priority Pollutant Phenolics and Fluorides	Watershed Conservation	Clean Water
391-2000-018	386-2000-021	10/27/1997	G	Implementation Guidance for Section 95.9 Phosphorus discharges to Free Flowing Streams	Watershed Conservation	Clean Water
391-2000-013	386-2000-022	11/4/1997	G	Implementation Guidance of Section 93.7 Ammonia Criteria	Watershed Management	Clean Water
385-2100-002	386-2100-002	11/12/2011	G	Policy and Procedure for NPDES Permitting of Discharges of Total Dissolved Solids	Water Standards and Facility Regulation	Clean Water
391-3200-013	386-3200-001	6/10/1997	G	Evaluations of Phosphorus Discharges to Lakes, Ponds, and Impoundments	Water Supply and Wastewater Management	Clean Water
392-0300-002	386-0300-003	9/28/2002	P	Comprehensive Stormwater Management Policy	Watershed Management	Clean Water

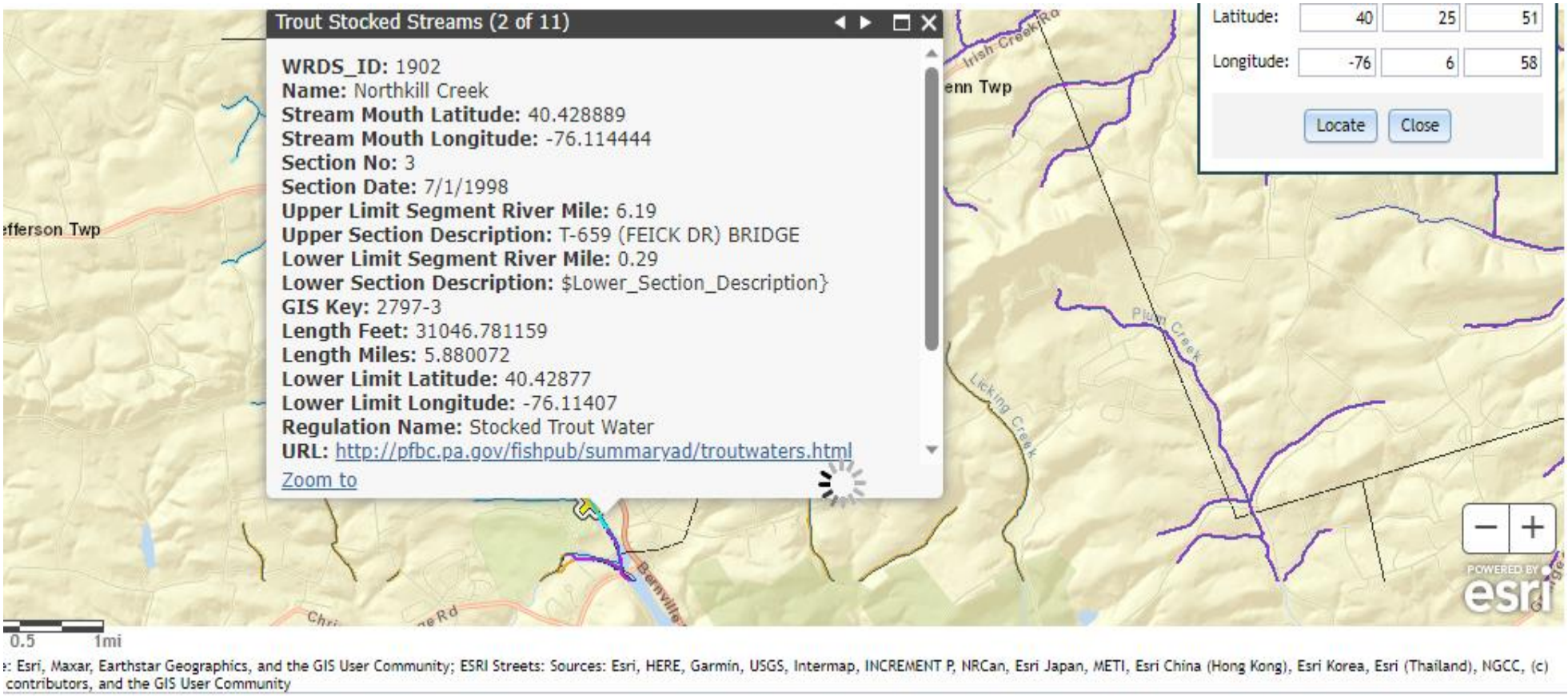
392-0300-001	386-0300-004	5/14/1985	G	Stormwater Management Guidelines and Model Ordinances	Watershed Management	Clean Water
363-4000-003	386-4000-001	38871	G	Standards and Guidelines for Identifying, Tracking, and Resolving Violations of the Storm Water Management Act	Watershed Management	Clean Water

Where G = Guidance, P = Policy


NORTH HEIDELBERG WWTF SCHEMATIC
SANITARY SEWER COLLECTION SYSTEM
COMMINUTER
EQ TANK
SUPERNATANT RETURN
SPLITTER BOX
AERATION TANK
AERATION TANK
CLARIFIER
CLARIFIER
POST AERATION
UV DISINFECTION
STREAM DISCHARGE
RETURN SLUDGE
WASTE SLUDGE
AEROBIC DIGESTION
WASTE SLUDGE REMOVAL FROM SITE BY PERMITTED HAULER FOR ULTIMATE TREATMENT AND DISPOSAL AT APPROVED FACILITY
AQUA PENNSYLVANIA WASTEWATER, INC.
NORTH HEIDELBERG
WASTEWATER TREATMENT FACILITY SCHEMATIC
JEFFERSON TOWNSHIP, BERKS COUNTY, PA.
E-XXXX


sewer service area
Outfall 001
North Heidelberg WWTP
Bernville
Kricks Mill
North Heidelberg
Conrads Bridge
Little Northkill Cr
Tulpehocken Creek
Palmer Pond
Old Christ Little Tulpehocken Cem.
New Christ Little Tulpehocken Cem
Stump Cem
Haags Cem
Saint Thomas Cem
Friedens Evangelical Lutheran Church Cem
Klein Cem
Kozie Burial Ground
0 2,000 4,000
1 INCH = 2,000 FEET
NO. DATE REVISION INTL
AQUA PENNSYLVANIA WASTEWATER, INC.
762 LANCASTER AVENUE, BRYN MAWR, PENNSYLVANIA, 19010
NORTH HEIDELBERG MAP
Drawn By: SC
Ck'd By: MJB
Date: 11/14/22
Scale: 1"=2,000'
FIGURE 1


Latitude: 40.430833 - Longitude: -76.116111
Municipalities (2 of 2)
Name: NORTH HEIDELBERG
Type: TWP
Code: 06947
Zoom to
Koenig Rd
Groff Rd
Heidelberg Country Club
Dogwood Dr
Walnut Dr W
Bernville Rd
N Main St
N Garfield Rd
Bright School Rd
183
State Gamelands No 280
0 0.2 0.4mi


Trout Stocked Streams (2 of 11)
WRDS_ID: 1902
Name: Northkill Creek
Stream Mouth Latitude: 40.428889
Stream Mouth Longitude: -76.114444
Section No: 3
Section Date: 7/1/1998
Upper Limit Segment River Mile: 6.19
Upper Section Description: T-659 (FEICK DR) BRIDGE
Lower Limit Segment River Mile: 0.29
Lower Section Description: $Lower_Section_Description}
GIS Key: 2797-3
Length Feet: 31046.781159
Length Miles: 5.880072
Lower Limit Latitude: 40.42877
Lower Limit Longitude: -76.11407
Regulation Name: Stocked Trout Water
URL: http://pfbc.pa.gov/fishpub/summaryad/troutwaters.html
Zoom to
Latitude: 40 25 51
Longitude: -76 6 58
Locate
Close
Irish Creek Rd
enn Twp
efferson Twp
Plum Creek
Licking Creek
Bernville
0.5
1mi
POWERED BY esri
: Esri, Maxar, Earthstar Geographics, and the GIS User Community; ESRI Streets: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) contributors, and the GIS User Community

Online Pa Code effective thru 53 Pa.B. 2932 (May 27, 203)

93.9f Drainage List F….DE River Basin

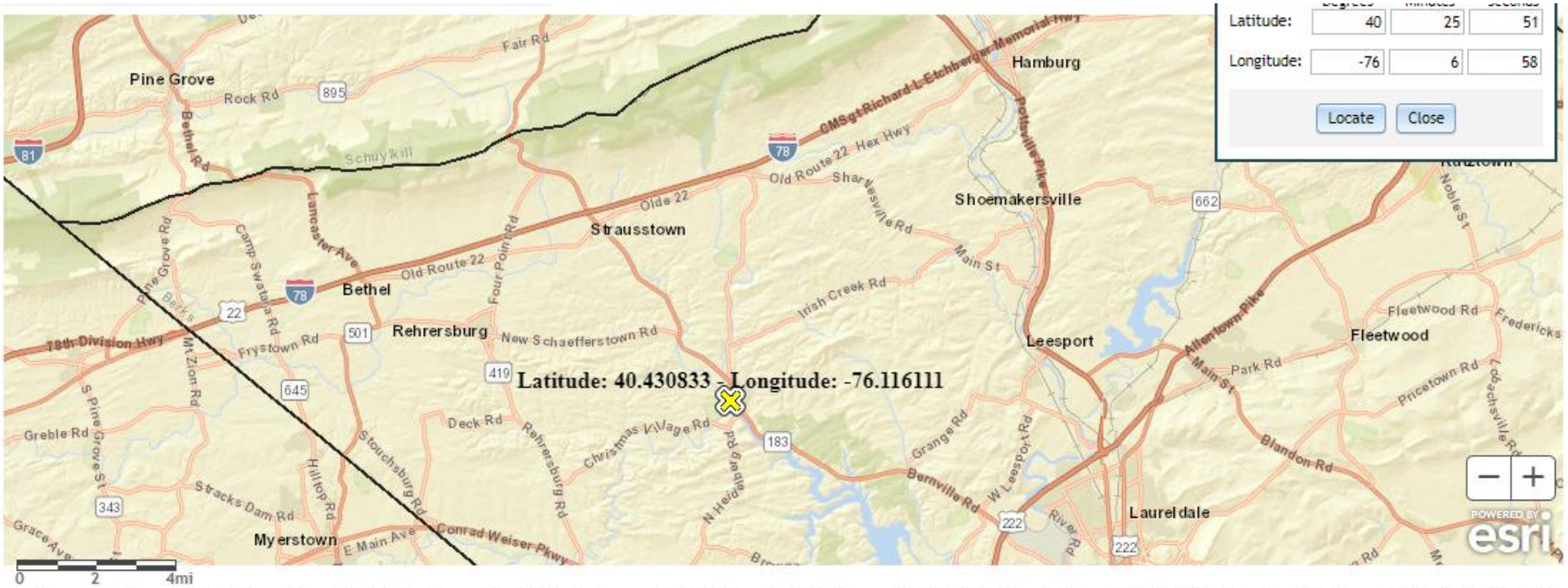
1-DE Estuary

2-Schuylkill River

3-Tulpehocken Creek

4-Northkill Creek…..

STREAM	ZONE	COUNTY	Uses	Exceptions
3—Tulpehocken Creek	Blue Marsh Reservoir	Berks	WWF, MF	None
4—Unnamed Tributaries to Blue Marsh Reservoir	Basins, Source to Slackwater of Blue Marsh Reservoir	Berks	TSF, MF	None
4—Northkill Creek	Basin, Source to I-78 Bridge	Berks	EV, MF	None
4—Northkill Creek	Basin, I-78 Bridge to Slackwater of Blue Marsh Reservoir	Berks	CWF, MF	None



agery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community; ESRI Streets: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) enStreetMap contributors, and the GIS User Community

DMR data, flow:

PA0033766	7/1/2021	7/31/2021	Monthly	1	1	Final Effluent	Flow	MGD	0.04	Monitor	Average Mc	0.066	Monitor	Daily Maximum					
PA0033766	8/1/2021	8/31/2021	Monthly	1	1	Final Effluent	Flow	MGD	0.043	Monitor	Average Mc	0.1	Monitor	Daily Maximum					
PA0033766	9/1/2021	9/30/2021	Monthly	3	1	Final Effluent	Flow	MGD		Monitor	Average Monthly		Monitor	Daily Maximum	coded as E, both avg mo and d max				
PA0033766	10/1/2021	10/31/2021	Monthly	1	1	Final Effluent	Flow	MGD	0.05	Monitor	Average Mc	0.117	Monitor	Daily Maximum					
PA0033766	11/1/2021	11/30/2021	Monthly	1	1	Final Effluent	Flow	MGD	0.057	Monitor	Average Mc	0.106	Monitor	Daily Maximum					
PA0033766	12/1/2021	12/31/2021	Monthly	1	1	Final Effluent	Flow	MGD	0.038	Monitor	Average Mc	0.067	Monitor	Daily Maximum					
PA0033766	1/1/2022	1/31/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.045	Monitor	Average Mc	0.066	Monitor	Daily Maximum					
PA0033766	2/1/2022	2/28/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.06	Monitor	Average Mc	0.21	Monitor	Daily Maximum					
PA0033766	3/1/2022	3/31/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.052	Monitor	Average Mc	0.098	Monitor	Daily Maximum					
PA0033766	4/1/2022	4/30/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.086	Monitor	Average Mc	0.281	Monitor	Daily Maximum					
PA0033766	5/1/2022	5/31/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.061	Monitor	Average Mc	0.187	Monitor	Daily Maximum					
PA0033766	6/1/2022	6/30/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.045	Monitor	Average Mc	0.077	Monitor	Daily Maximum					
PA0033766	7/1/2022	7/31/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.046	Monitor	Average Mc	0.096	Monitor	Daily Maximum					
PA0033766	8/1/2022	8/31/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.046	Monitor	Average Mc	0.072	Monitor	Daily Maximum					
PA0033766	9/1/2022	9/30/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.0388	Monitor	Average Mc	0.0756	Monitor	Daily Maximum					
PA0033766	10/1/2022	10/31/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.041	Monitor	Average Mc	0.09	Monitor	Daily Maximum					
PA0033766	11/1/2022	11/30/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.0509	Monitor	Average Mc	0.0857	Monitor	Daily Maximum					
PA0033766	12/1/2022	12/31/2022	Monthly	1	1	Final Effluent	Flow	MGD	0.09	Monitor	Average Mc	0.251	Monitor	Daily Maximum					
PA0033766	1/1/2023	1/31/2023	Monthly	1	1	Final Effluent	Flow	MGD	0.088	Monitor	Average Mc	0.189	Monitor	Daily Maximum					
PA0033766	2/1/2023	2/28/2023	Monthly	1	1	Final Effluent	Flow	MGD	0.052	Monitor	Average Mc	0.121	Monitor	Daily Maximum					
PA0033766	3/1/2023	3/31/2023	Monthly	1	1	Final Effluent	Flow	MGD	0.066	Monitor	Average Mc	0.191	Monitor	Daily Maximum					
PA0033766	4/1/2023	4/30/2023	Monthly	1	1	Final Effluent	Flow	MGD	0.044	Monitor	Average Mc	0.092	Monitor	Daily Maximum					
PA0033766	5/1/2023	5/31/2023	Monthly	1	1	Final Effluent	Flow	MGD	0.045	Monitor	Average Mc	0.107	Monitor	Daily Maximum					
PA0033766	6/1/2023	6/30/2023	Monthly	1	1	Final Effluent	Flow	MGD	0.049	Monitor	Average Mc	0.115	Monitor	Daily Maximum					
									0.054	Avg		0.124	Avg						
									0.090	Max		0.281	Max						
									0.082	90th percentile		0.2062	90th percentile						

StreamStats Output Report -Northkill Crk at N.Heidelbg STP's 001				
State/Region ID	PA			
Workspace ID	PA20230803171703852000			
Latitude	40.43071			
Longitude	-76.1158			
Time	8/3/2023	1:17:24 PM		
Basin Characteristics				
Parameter Code	Paramete	Value	Unit	
CARBON	Percentag	1.15	percent	
DRNAREA	Area that	41.6	square miles	
PRECIP	Mean Ann	46	inches	
ROCKDEP	Depth to r	3.6	feet	
STRDEN	Stream De	1.54	miles per square mile	
Low-Flow Statistics Flov	100.0 Percent Low Flow Region 2			
Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	5.81	ft^3/s	38	38
30 Day 2 Year Low Flow	8.24	ft^3/s	33	33
7 Day 10 Year Low Flow	2.25	ft^3/s	51	51
30 Day 10 Year Low Flow	3.34	ft^3/s	46	46
90 Day 10 Year Low Flow	5.6	ft^3/s	36	36
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USGS Software Disclaimer: This software has been approved for release by the U.S. Geological Survey (USGS). Althoug				
USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does no				
Application Version: 4.16.1				
StreamStats Services Version: 1.2.22				
NSS Services Version: 2.2.1				

Downstream points from N.Heidelberg STP……..

StreamStats Output Report-Northkill Crk at Bernville STP's 001				
State/Reg	PA			
Workspac	PA20230803172621124000			
Latitude	40.42805			
Longitude	-76.1136			
Time	8/3/2023	1:26:41 PM		
Basin Characteristics				
Paramete	Paramete	Value	Unit	
CARBON	Percentag	1.13	percent	
DRNAREA	Area that	42	square miles	
PRECIP	Mean Ann	46	inches	
ROCKDEP	Depth to r	3.6	feet	
STRDEN	Stream De	1.53	miles per square mile	
Low-Flow	100.0 Percent Low Flow Region 2			
Statistic	Value	Unit	SE	ASEp
7 Day 2 Ye	5.91	ft^3/s	38	38
30 Day 2 Y	8.37	ft^3/s	33	33
7 Day 10 Y	2.29	ft^3/s	51	51
30 Day 10	3.39	ft^3/s	46	46
90 Day 10	5.69	ft^3/s	36	36

Downstream points from N.Heidelberg STP……..

StreamStats Report-at confl Northkill Crk & Tulpehocken Crk					
State/Region ID	PA				
Workspace ID	PA20230803173658241000				
Latitude	40.42565				
Longitude	-76.11249				
Time	8/3/2023	1:37:19 PM			
Basin Characteristics					
Parameter Code	Parameter Description	Value	Unit		
CARBON	Percentage of area of carbo	1.13	percent		
DRNAREA	Area that drains to a pt. on a stream	42.2	square	miles	
PRECIP	Mean Annual Precipitation	46	inches		
ROCKDEP	Depth to rock	3.6	feet		
STRDEN	Stream Density -- total leng	1.53	miles per square		
Low-Flow Statistics Fl	100.0 Percent Low Flow Region 2				
Statistic	Value	Unit	SE	ASEp	
7 Day 2 Year Low Flow	5.94	ft^3/s	38	38	
30 Day 2 Year Low Flo	8.41	ft^3/s	33	33	
7 Day 10 Year Low Flo	2.3	ft^3/s	51	51	
30 Day 10 Year Low Fl	3.41	ft^3/s	46	46	
90 Day 10 Year Low Fl	5.72	ft^3/s	36	36	

StreamStats Gage-after Blue Marsh Lake on Tulpehocken Crk							
USGS Station Number	1470960						
Station Name	Tulpehocken Cr at Blue Marsh Damsite near Reading, Pa.						
Station Type	Gaging Station, continuous record						
Latitude	40.37065						
Longitude	-76.0252						
Is regulated?	TRUE						
Agency	United States Geological Survey						
NWIS Discharge Period of Record	1965-04-30 - 2023-08-01						
Basin Dimensional Characteristics							
Characteristic Name	Value	Units	Citation				
Contributing Drainage Area	175	square miles	193				
Drainage Area	175	square miles	142				
Characteristic Name	Value	Units	Citation				
Percent Forest	26.26	percent	139				
Percent Storage	1.94	percent	142				
Percent Urban	3.08	percent	142				
Percent Storage	1.87	percent	169				
Depth to Rock	4.325833	feet	139				
Percent Carbonate	42.1	percent	142				
Percent of Glaciation	0	percent	139				
Percent Carbonate	41.59	percent	169				
Mean Annual Precipitation	44.59	inches	139				
Mean Basin Elevation	544	feet	142				
Mean Basin Slope degrees	4.83	degrees	139				
Maximum Basin Elevation	1642	feet	169				
Mean Basin Slope degrees	5.34	degrees	169				
Stream Density	1.28	miles per square mile	139				
Low-Flow Statistics							
Statistic Name	Value	Units	Citation	Comments			
1 Day 10 Year Low Flow	32.7	cubic feet per second	49	Statistic Date Range 4/1/1966 - 3/31/197			
7 Day 2 Year Low Flow	74	cubic feet per second	49	Statistic Date Range 4/1/1966 - 3/31/197			
7 Day 10 Year Low Flow	38.2	cubic feet per second	49	Statistic Date Range 4/1/1966 - 3/31/197			
30 Day 2 Year Low Flow	88.3	cubic feet per second	49	Statistic Date Range 4/1/1966 - 3/31/197			
30 Day 10 Year Low Flow	47.6	cubic feet per second	49	Statistic Date Range 4/1/1966 - 3/31/197			

7 Day 10 Year Low Flow	38.2	cubic feet per second	49	Statistic Date Range 4/1/1966 - 3/31/1978
30 Day 2 Year Low Flow	88.3	cubic feet per second	49	Statistic Date Range 4/1/1966 - 3/31/1978
30 Day 10 Year Low Flow	47.6	cubic feet per second	49	Statistic Date Range 4/1/1966 - 3/31/1978
90 Day 10 Year Low Flow	59.5	cubic feet per second	49	Statistic Date Range 4/1/1966 - 3/31/1978
Low flow years	12	years	49	
Controlled 1 Day 10 Year Low Flow	29.4	cubic feet per second	49	Statistic Date Range 4/1/1979 - 3/31/2008
Controlled 7 Day 2 Year Low Flow	52.4	cubic feet per second	49	Statistic Date Range 4/1/1979 - 3/31/2008
Controlled 7 Day 10 Year Low Flow	31.8	cubic feet per second	49	Statistic Date Range 4/1/1979 - 3/31/2008
Controlled 30 Day 2 Year Low Flow	74.7	cubic feet per second	49	Statistic Date Range 4/1/1979 - 3/31/2008
Controlled 30 Day 10 Year Low Flow	47	cubic feet per second	49	Statistic Date Range 4/1/1979 - 3/31/2008
Controlled 90 Day 10 Year Low Flow	66.3	cubic feet per second	49	Statistic Date Range 4/1/1979 - 3/31/2008

ID	Citation
142	Roland, M.A., and Stuckey, M.H., 2008, Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geolog
49	Stuckey, M.H., and Roland, M.A., 2011, Selected streamflow statistics for streamgage locations in and near Pennsylvania: U.S. Geological Survey Open-File Report 2011-10

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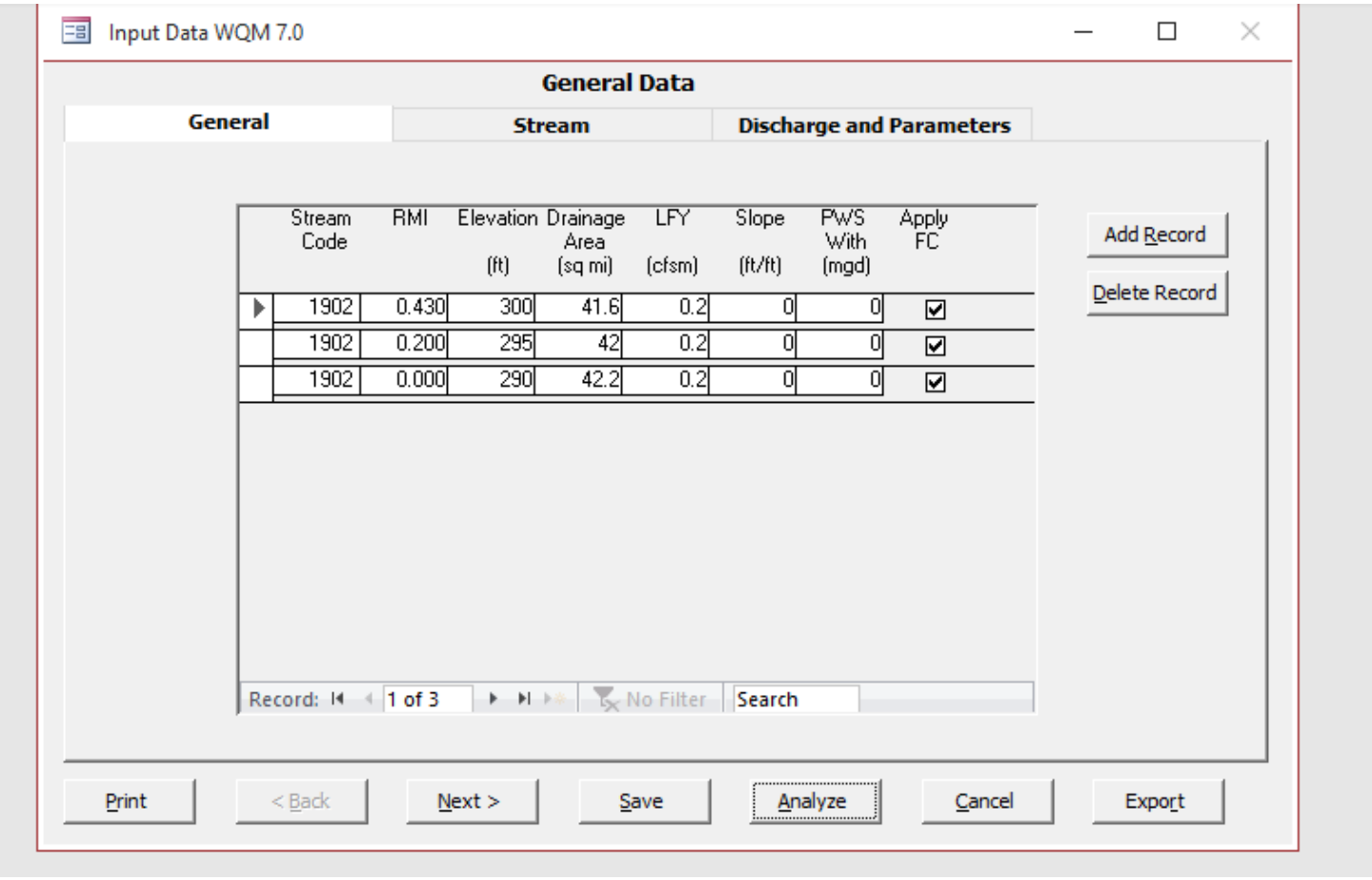
Application Version: 4.16.1


Input Data WQM 7.0
General Data
General
Stream
Discharge and Parameters
Stream Code
RMI
Elevation (ft)
Drainage Area (sq mi)
LFY (cfsm)
Slope (ft/ft)
PWS With (mgd)
Apply FC
1902 0.430 300 41.6 0.2 0 0
1902 0.200 295 42 0.2 0 0
1902 0.000 290 42.2 0.2 0 0
Record: 1 of 3
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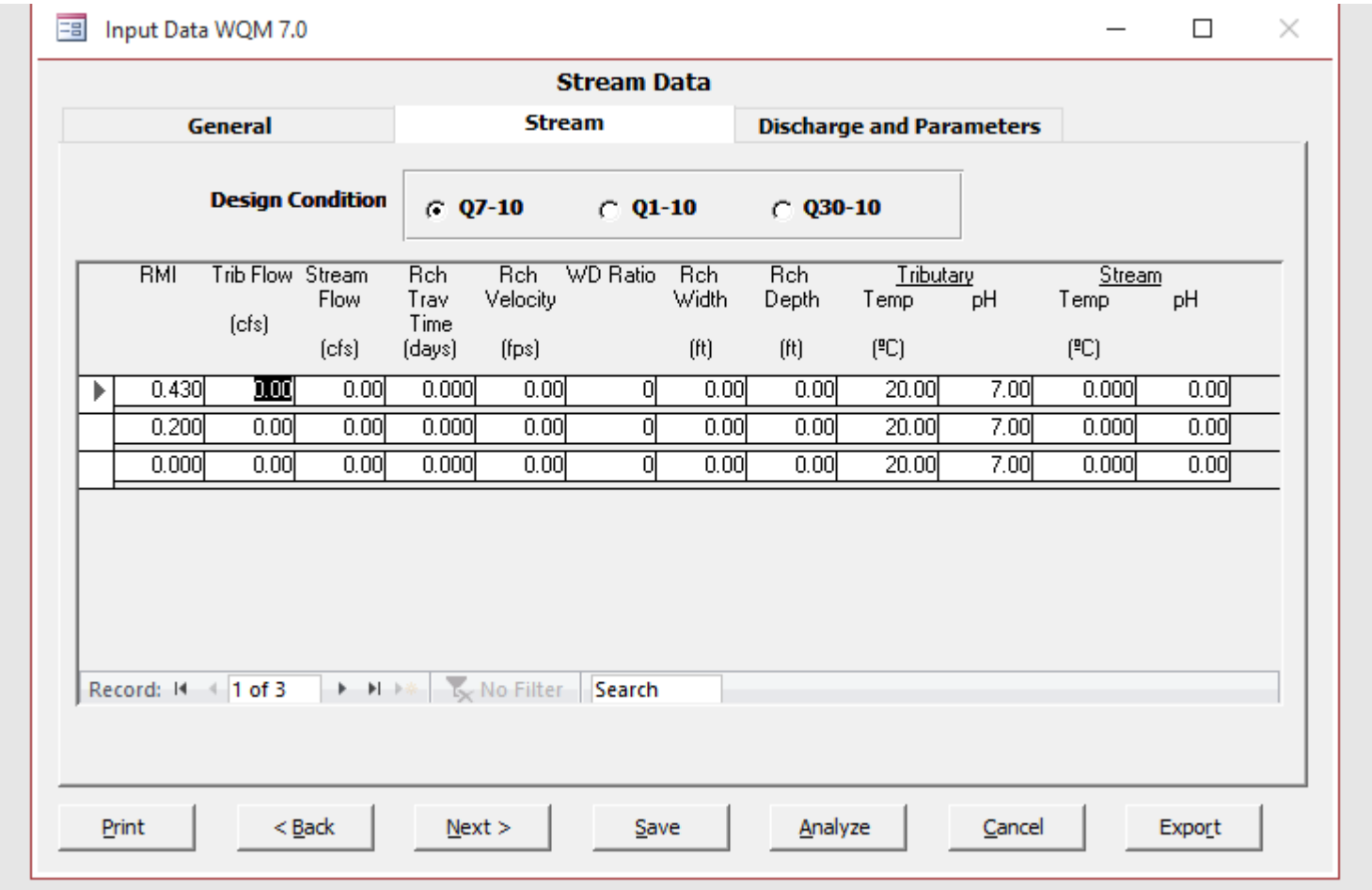
Search
Add Record
Delete Record
Print
< Back
Next >
Save
Analyze
Cancel
Export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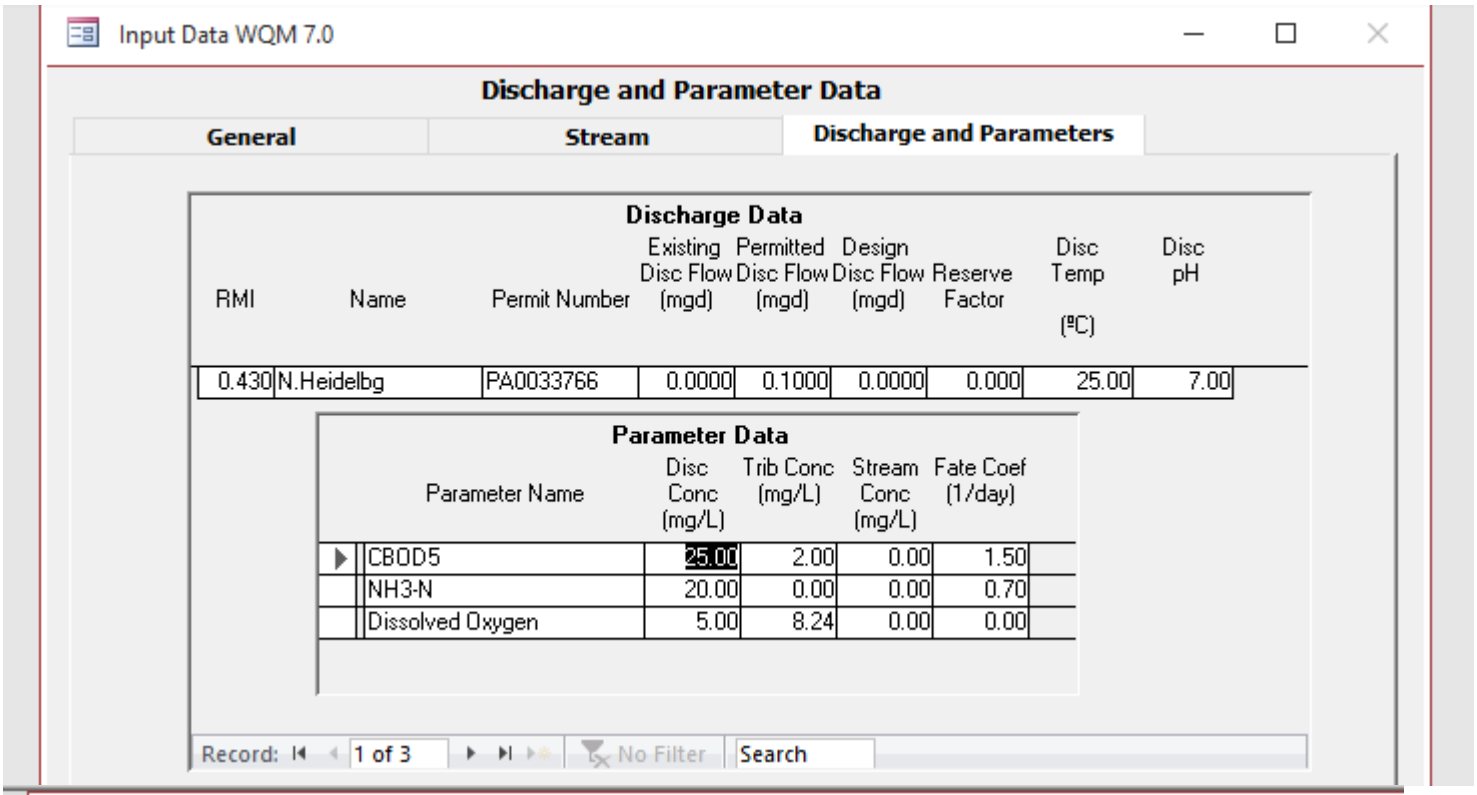
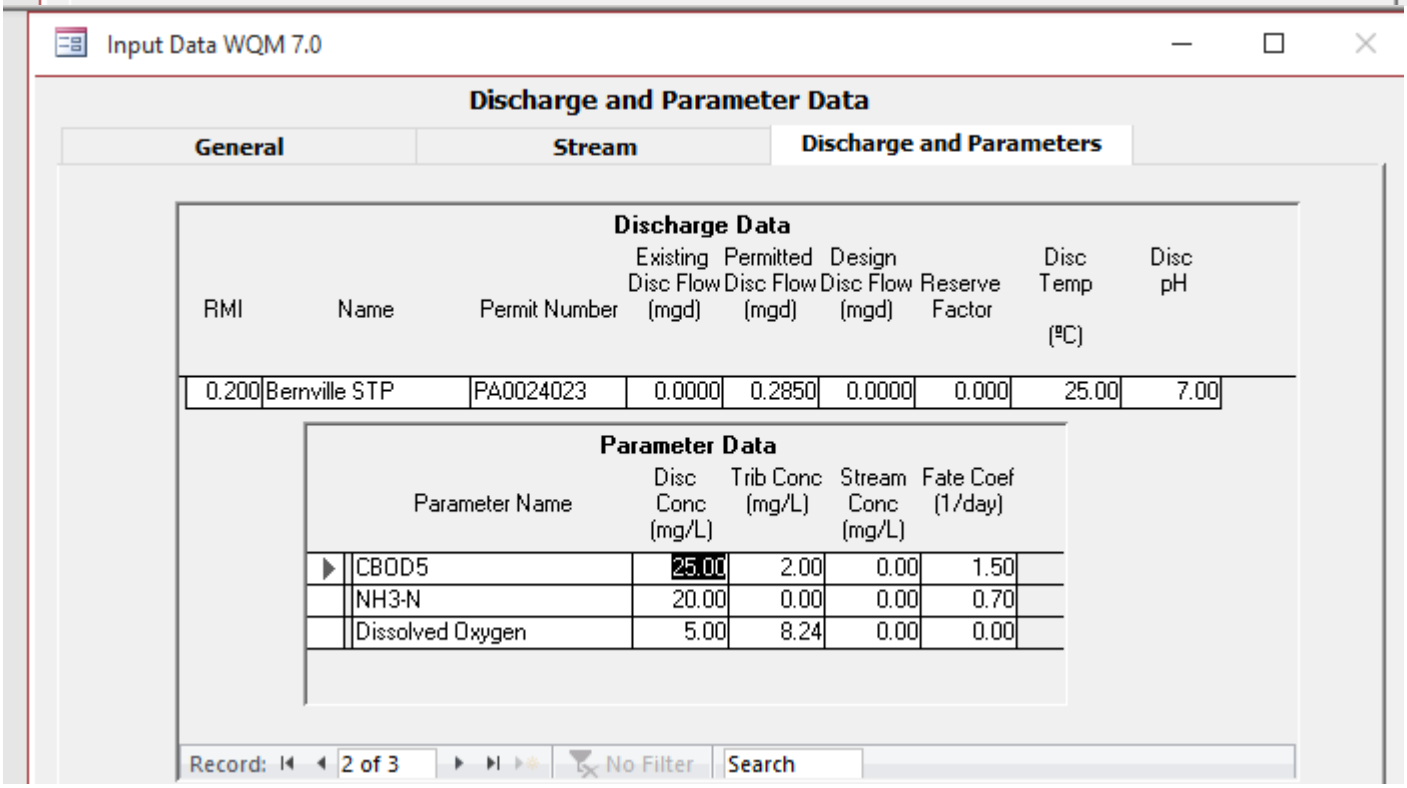
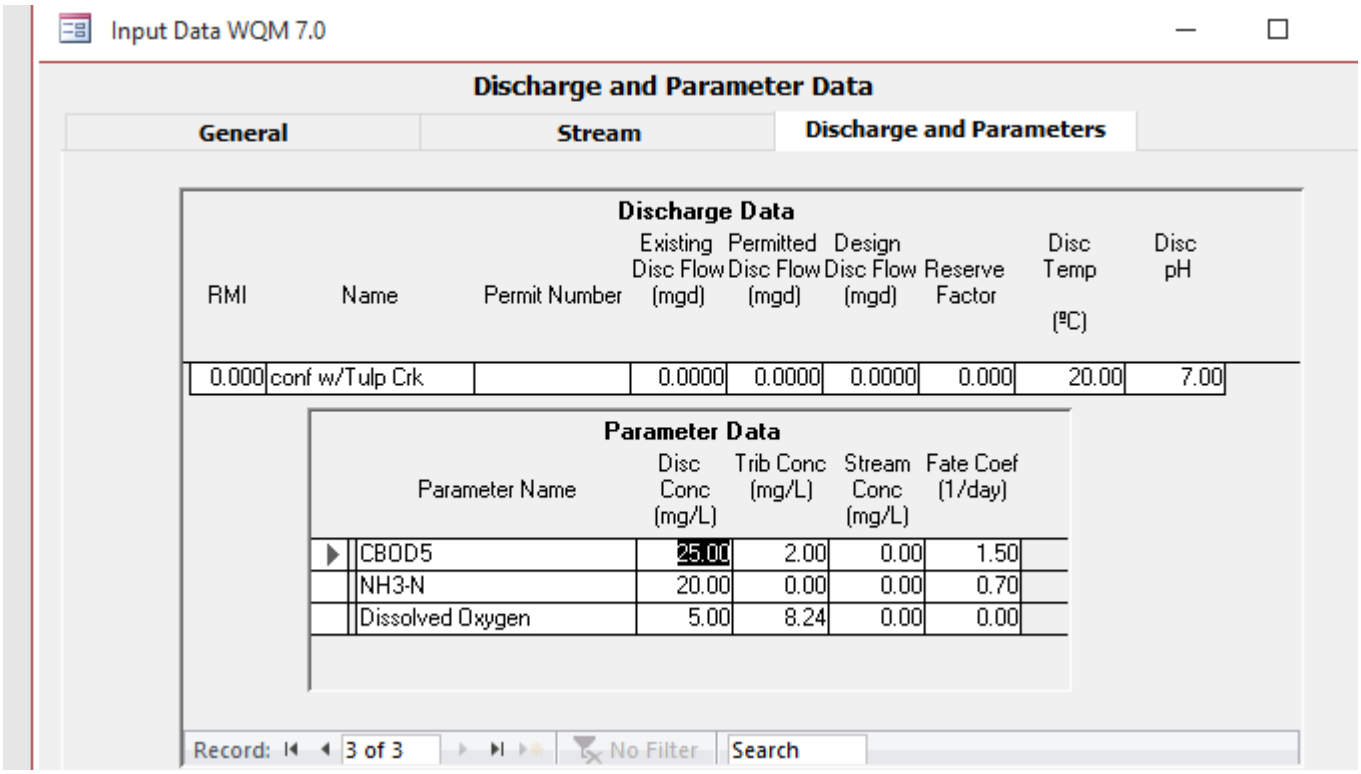
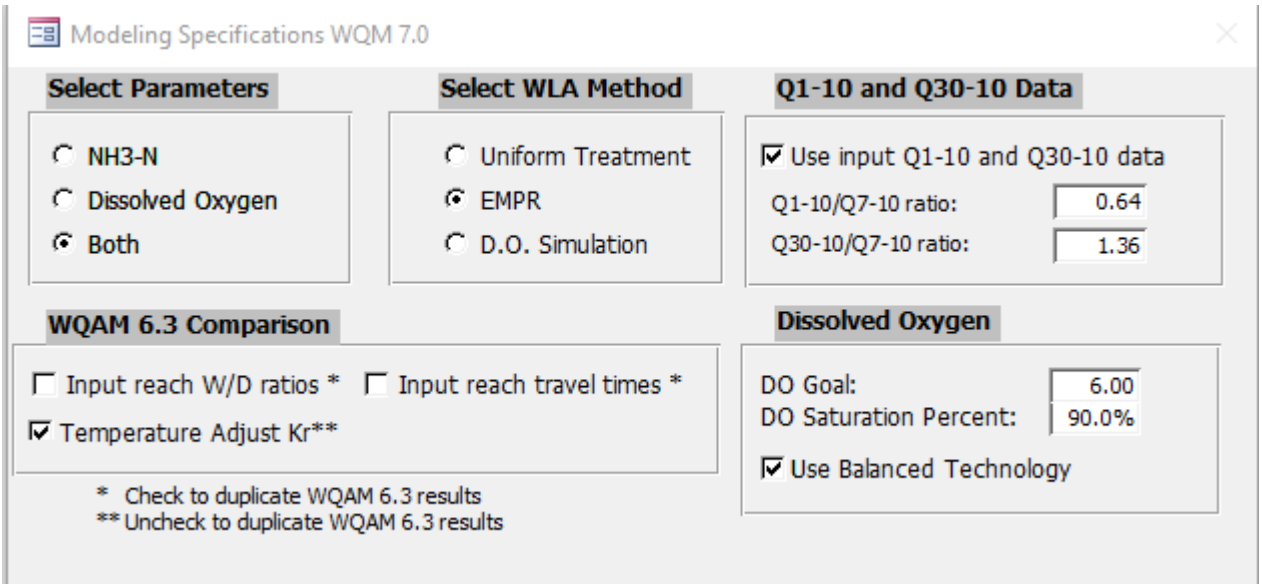
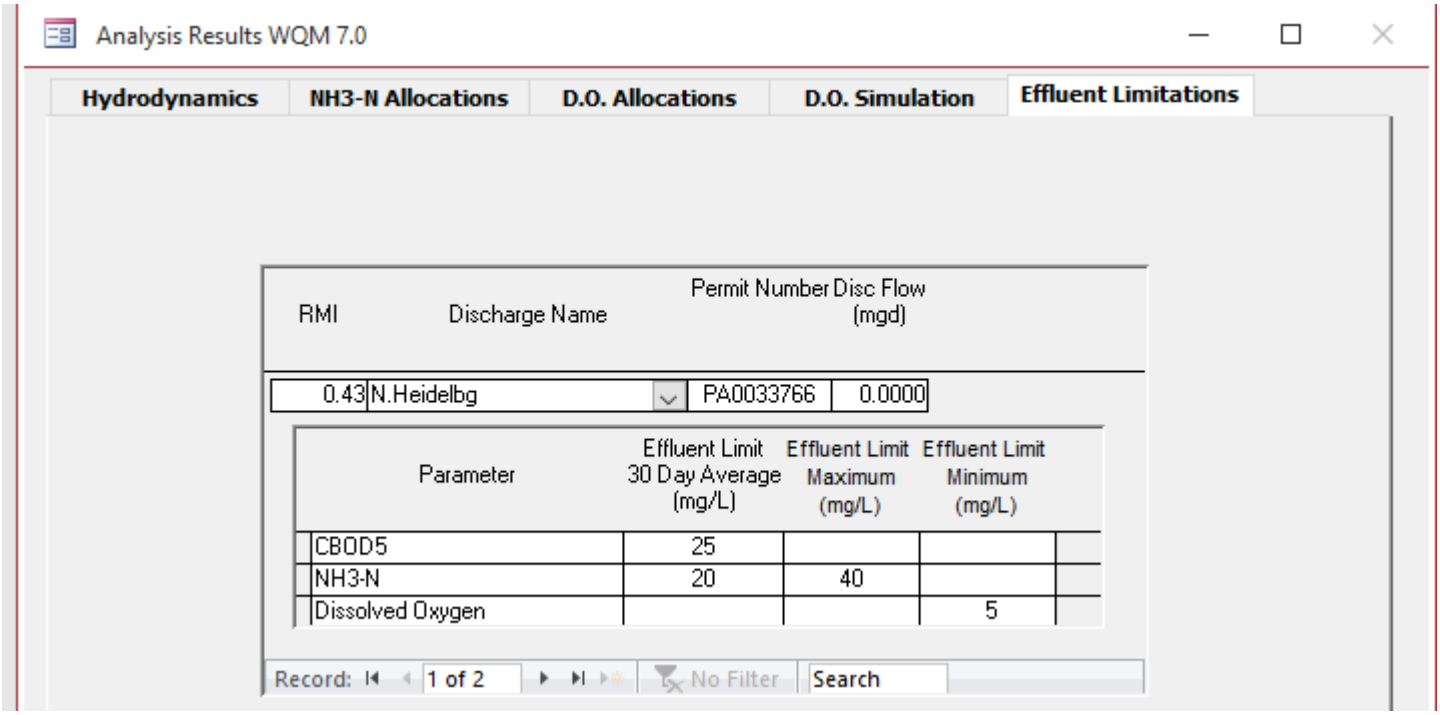
Stream Data
General
Stream
Discharge and Parameters
Design Condition
Q7-10
Q1-10
Q30-10
RMI
Trib Flow (cfs)
Stream Flow (cfs)
Rch Trav Time (days)
Rch Velocity (fps)
WD Ratio
Rch Width (ft)
Rch Depth (ft)
Tributary Temp (ºC)
Tributary pH
Stream Temp (ºC)
Stream pH
0.430 0.00 0.00 0.000 0.00 0 0.00 0.00 20.00 7.00 0.000 0.00
0.200 0.00 0.00 0.000 0.00 0 0.00 0.00 20.00 7.00 0.000 0.00
0.000 0.00 0.00 0.000 0.00 0 0.00 0.00 20.00 7.00 0.000 0.00
Record: 1 of 3
No Filter
Search
Print
< Back
Next >
Save
Analyze
Cancel
Export

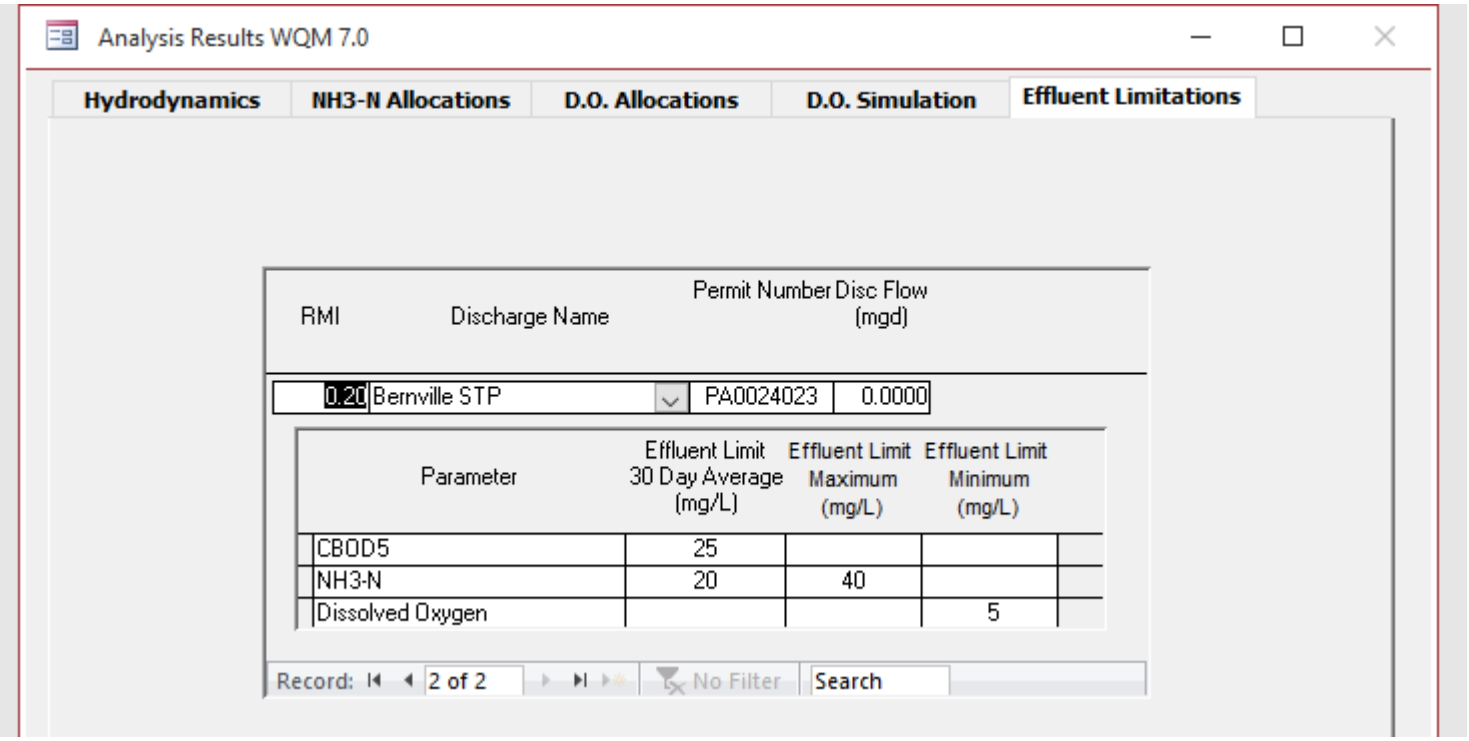

Input Data WQM 7.0
Discharge and Parameter Data
General
Stream
Discharge and Parameters
Discharge Data
RMI
Name
Permit Number
Existing Disc Flow (mgd)
Permitted Disc Flow (mgd)
Design Disc Flow (mgd)
Reserve Factor
Disc Temp (ºC)
Disc pH
0.430
N.Heidelbg
PA0033766
0.0000
0.1000
0.0000
0.000
25.00
7.00
Parameter Data
Parameter Name
Disc Conc (mg/L)
Trib Conc (mg/L)
Stream Conc (mg/L)
Fate Coef (1/day)
CBOD5
25.00
2.00
0.00
1.50
NH3-N
20.00
0.00
0.00
0.70
Dissolved Oxygen
5.00
8.24
0.00
0.00
Record: 1 of 3
No Filter
Search


Input Data WQM 7.0
Discharge and Parameter Data
General
Stream
Discharge and Parameters
Discharge Data
RMI
Name
Permit Number
Existing Disc Flow (mgd)
Permitted Disc Flow (mgd)
Design Disc Flow (mgd)
Reserve Factor
Disc Temp (ºC)
Disc pH
0.200
Bernville STP
PA0024023
0.0000
0.2850
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/day)
CBOD5
25.00
2.00
0.00
1.50
NH3-N
20.00
0.00
0.00
0.70
Dissolved Oxygen
5.00
8.24
0.00
0.00
Record: 2 of 3
No Filter
Search


Input Data WQM 7.0
Discharge and Parameter Data
General
Stream
Discharge and Parameters
Discharge Data
RMI
Name
Permit Number
Existing Disc Flow (mgd)
Permitted Disc Flow (mgd)
Design Disc Flow (mgd)
Reserve Factor
Disc Temp (ºC)
Disc pH
0.000
conf w/Tulp Crk
0.0000
0.0000
0.0000
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/day)
CBOD5
25.00
2.00
0.00
1.50
NH3-N
20.00
0.00
0.00
0.70
Dissolved Oxygen
5.00
8.24
0.00
0.00
Record:
3 of 3
No Filter
Search


Modeling Specifications WQM 7.0
Select Parameters
NH3-N
Dissolved Oxygen
Both
Select WLA Method
Uniform Treatment
EMPR
D.O. Simulation
Q1-10 and Q30-10 Data
Use input Q1-10 and Q30-10 data
Q1-10/Q7-10 ratio: 0.64
Q30-10/Q7-10 ratio: 1.36
WQAM 6.3 Comparison
Input reach W/D ratios *
Input reach travel times *
Temperature Adjust Kr**
* Check to duplicate WQAM 6.3 results
** Uncheck to duplicate WQAM 6.3 results
Dissolved Oxygen
DO Goal: 6.00
DO Saturation Percent: 90.0%
Use Balanced Technology


Analysis Results WQM 7.0
Hydrodynamics
NH3-N Allocations
D.O. Allocations
D.O. Simulation
Effluent Limitations
RMI
Discharge Name
Permit Number
Disc Flow (mgd)
0.43
N.Heidelbg
PA0033766
0.0000
Parameter
Effluent Limit 30 Day Average (mg/L)
Effluent Limit Maximum (mg/L)
Effluent Limit Minimum (mg/L)
CBOD5 25
NH3-N 20 40
Dissolved Oxygen 5
Record: 1 of 2
No Filter
Search



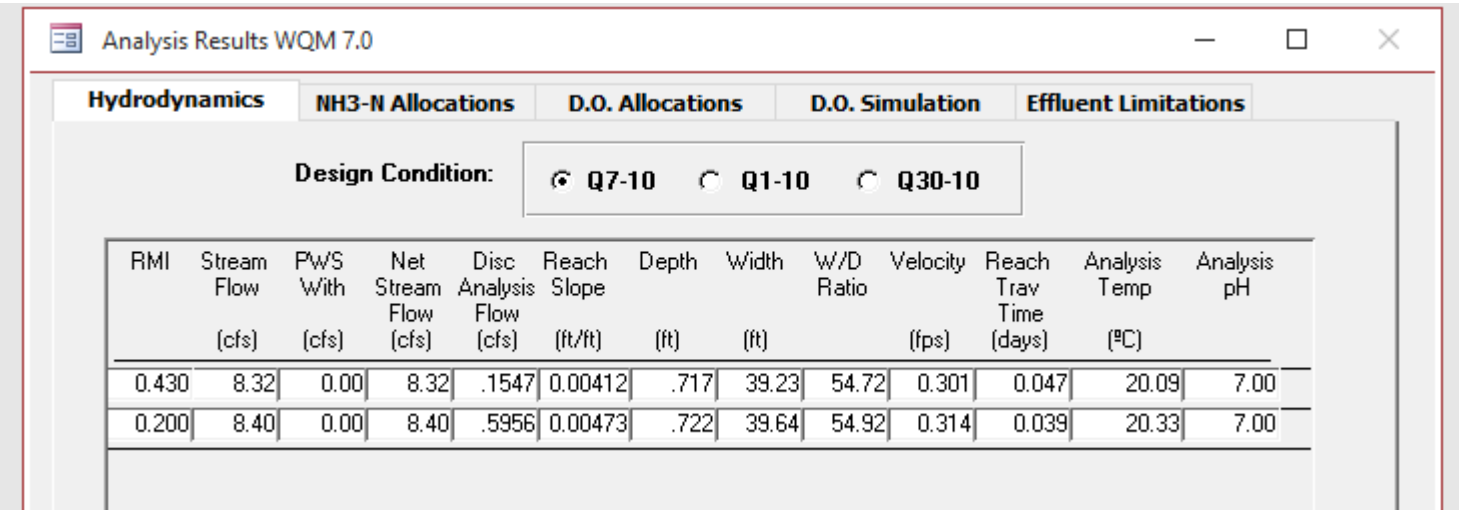
Analysis Results WQM 7.0

Hydrodynamics | NH3-N Allocations | D.O. Allocations | D.O. Simulation | Effluent Limitations

RMI	Discharge Name	Permit Number	Disc Flow (mgd)
0.20	Bernville STP	PA0024023	0.0000

Parameter	Effluent Limit 30 Day Average (mg/L)	Effluent Limit Maximum (mg/L)	Effluent Limit Minimum (mg/L)
CBOD5	25		
NH3-N	20	40	
Dissolved Oxygen			5

Record: 2 of 2 | No Filter | Search

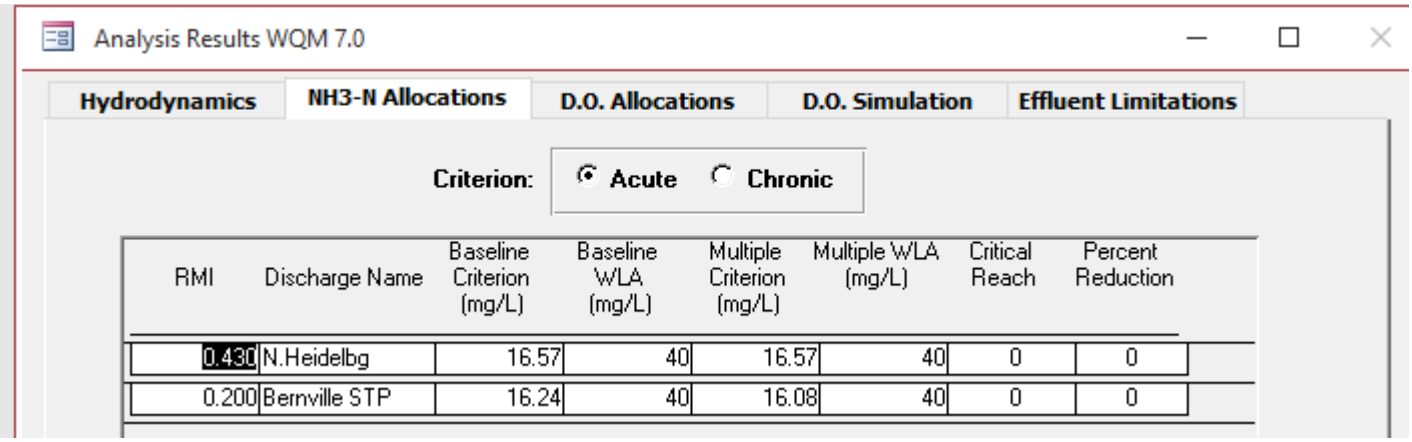


Analysis Results WQM 7.0

Hydrodynamics | NH3-N Allocations | D.O. Allocations | D.O. Simulation | Effluent Limitations

Design Condition: (•) Q7-10 ( ) Q1-10 ( ) Q30-10

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
0.430	8.32	0.00	8.32	.1547	0.00412	.717	39.23	54.72	0.301	0.047	20.09	7.00
0.200	8.40	0.00	8.40	.5956	0.00473	.722	39.64	54.92	0.314	0.039	20.33	7.00

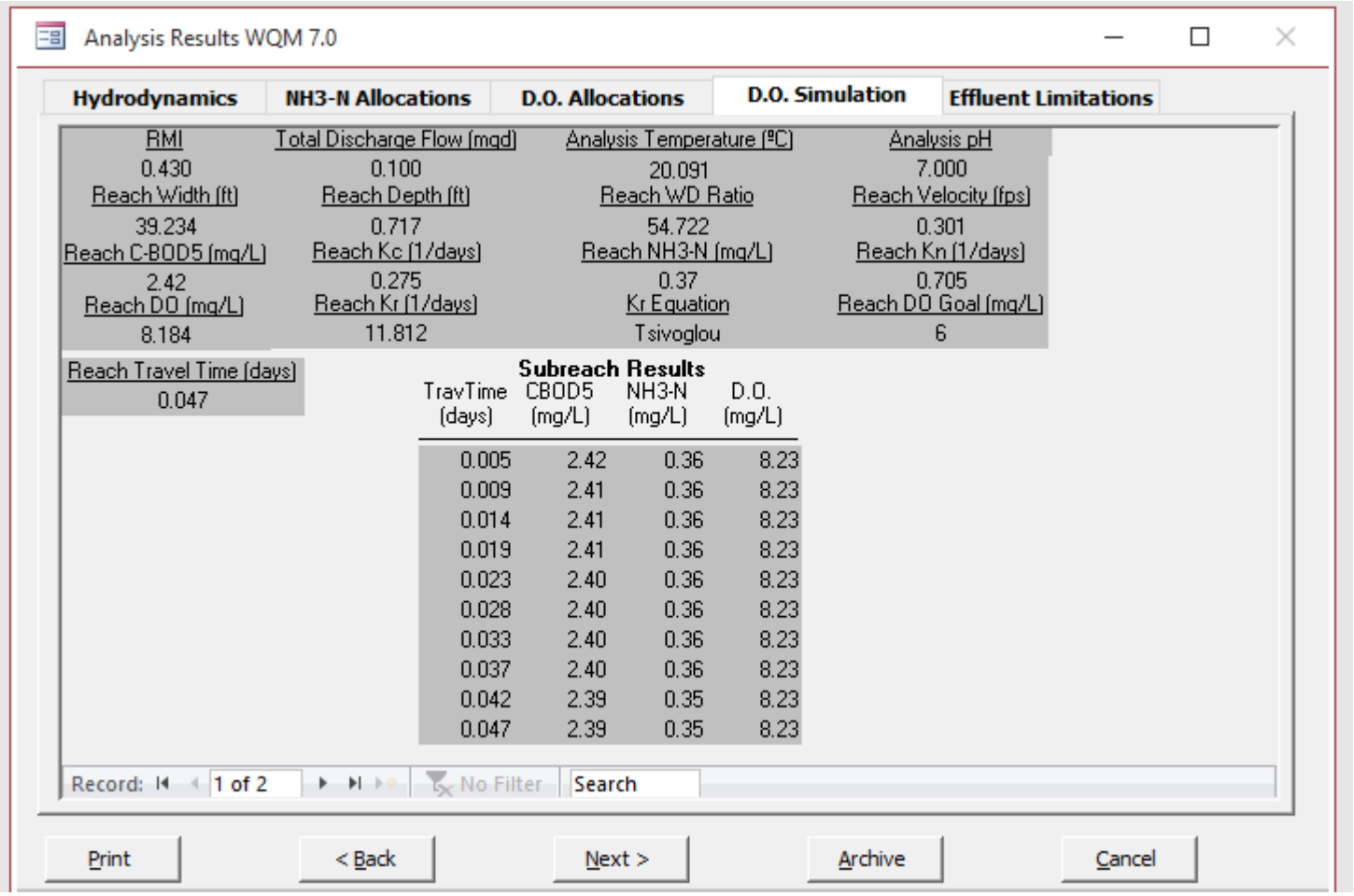


Analysis Results WQM 7.0

Hydrodynamics | NH3-N Allocations | D.O. Allocations | D.O. Simulation | Effluent Limitations

Criterion: (•) Acute ( ) Chronic

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.430	N.Heidelbg	16.57	40	16.57	40	0	0
0.200	Bernville STP	16.24	40	16.08	40	0	0


Analysis Results WQM 7.0
Hydrodynamics
NH3-N Allocations
D.O. Allocations
D.O. Simulation
Effluent Limitations
RMI
0.430
Total Discharge Flow (mgd)
0.100
Analysis Temperature (ºC)
20.091
Analysis pH
7.000
Reach Width (ft)
39.234
Reach Depth (ft)
0.717
Reach W/D Ratio
54.722
Reach Velocity (fps)
0.301
Reach C-BOD5 (mg/L)
2.42
Reach Kc (1/days)
0.275
Reach NH3-N (mg/L)
0.37
Reach Kn (1/days)
0.705
Reach DO (mg/L)
8.184
Reach Kr (1/days)
11.812
Kr Equation
Tsivoglou
Reach DO Goal (mg/L)
6
Reach Travel Time (days)
0.047
Subreach Results
TravTime (days)
CBOD5 (mg/L)
NH3-N (mg/L)
D.O. (mg/L)
0.005 2.42 0.36 8.23
0.009 2.41 0.36 8.23
0.014 2.41 0.36 8.23
0.019 2.41 0.36 8.23
0.023 2.40 0.36 8.23
0.028 2.40 0.36 8.23
0.033 2.40 0.36 8.23
0.037 2.40 0.36 8.23
0.042 2.39 0.35 8.23
0.047 2.39 0.35 8.23
Record: 1 of 2
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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

N.Heidelberg STP, NPDES Permit No. PA0033766, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Northkill 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	001902	0.43	300	41.6			Yes
End of Reach 1	001902	0.2	295	42			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	0.43	0.2										100	7		
End of Reach 1	0.2	0.2										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	0.43														
End of Reach 1	0.2														

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **N.Heidelberg STP** NPDES Permit No.: **PA0033766** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **treated 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	7						

					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		621									
	Chloride (PWS)	mg/L		182									
	Bromide	mg/L	<	0.1									
	Sulfate (PWS)	mg/L		43									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		280									
	Total Antimony	µg/L	<	3									
	Total Arsenic	µg/L	<	1									
	Total Barium	µg/L		49									
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L		300									
	Total Cadmium	µg/L	<	1									
	Total Chromium (III)	µg/L	<	1									
	Hexavalent Chromium	µg/L	<	0.25									
	Total Cobalt	µg/L	<	5									
	Total Copper	mg/L		0.006									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	10									
	Dissolved Iron	µg/L											
	Total Iron	µg/L		30									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L	<	2									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		3.1									
	Total Phenols (Phenolics) (PWS)	µg/L	<	2									
	Total Selenium	µg/L	<	1									
	Total Silver	µg/L	<	1									
	Total Thallium	µg/L	<	3									
	Total Zinc	mg/L		0.028									
	Total Molybdenum	µg/L											

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

N.Heidelberg STP, NPDES Permit No. PA0033766, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.536 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 Aluminum	0	0		0	750	750	22,372	
Total Antimony	0	0		0	1,100	1,100	32,812	
Total Arsenic	0	0		0	340	340	10,142	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	626,408	
Total Boron	0	0		0	8,100	8,100	241,615	
Total Cadmium	0	0		0	2.014	2.13	63.6	Chem Translator of 0.944 applied
Total Chromium (III)	0	0		0	569.763	1,803	53,783	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	486	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	2,834	
Total Copper	0	0		0	13.439	14.0	418	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	2,435	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	49.1	Chem Translator of 0.85 applied
Total Nickel	0	0		0	468.236	469	13,995	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	3.217	3.78	113	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	1,939	
Total Zinc	0	0		0	117.180	120	3,574	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 52.203 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

☑ ***CFC*** CCT (min): 52.203 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Model Results 8/22/2023

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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	12,052	
Total Arsenic	0	0		0	150	150	8,217	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	224,604	
Total Boron	0	0		0	1,600	1,600	87,650	
Total Cadmium	0	0		0	0.246	0.27	14.8	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	74.115	86.2	4,721	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	569	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	1,041	
Total Copper	0	0		0	8.956	9.33	511	Chem Translator of 0.96 applied
Total Iron	0	0		0	1,500	1,500	82,172	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.517	3.18	174	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	49.6	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.007	52.2	2,858	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	273	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	712	
Total Zinc	0	0		0	118.139	120	6,564	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 52.203 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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	307	
Total Arsenic	0	0		0	10	10.0	548	
Total Barium	0	0		0	2,400	2,400	131,476	
Total Boron	0	0		0	3,100	3,100	169,823	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	

Model Results 8/22/2023 F

Total Manganese	0	0		0	1,000	1,000	54,782	
Total Mercury	0	0		0	0.050	0.05	2.74	
Total Nickel	0	0		0	610	610	33,417	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	13.1	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 17.254 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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***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 Thallium	Report	Report	Report	Report	Report	µg/L	13.1	THH	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 discharg 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 Aluminum	14,339	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	307	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	131,476	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	87,650	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	14.8	µg/L	Discharge Conc ≤ 10% WQBEL
Total Chromium (III)	4,721	µg/L	Discharge Conc < TQL
Hexavalent Chromium	312	µg/L	Discharge Conc < TQL
Total Cobalt	1,041	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	0.27	mg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Total Iron	82,172	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	174	µg/L	Discharge Conc < TQL
Total Manganese	54,782	µg/L	Discharge Conc < TQL
Total Mercury	2.74	µg/L	Discharge Conc < TQL
Total Nickel	2,858	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	273	µg/L	Discharge Conc < TQL
Total Silver	72.4	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	2.29	mg/L	Discharge Conc ≤ 10% WQBEL