

Application Type Renewal
Facility Type Municipal
Major / Minor Major

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application No. PA0027316
APS ID 789786
Authorization ID 1359674

Applicant and Facility Information

Applicant Name <u>Lebanon City Authority</u>	Facility Name <u>Lebanon City STP</u>
Applicant Address <u>2321 Ridgeview Road</u> <u>Lebanon, PA 17042-9431</u>	Facility Address <u>2321 Ridgeview Road</u> <u>Lebanon, PA 17042-9431</u>
Applicant Contact <u>Frank Discuillo</u>	Facility Contact <u>Frank Discuillo</u>
Applicant Phone <u>(717) 272-2841</u>	Facility Phone <u></u>
Client ID <u>43458</u>	Site ID <u>454832</u>
Ch 94 Load Status <u>Not Overloaded</u>	Municipality <u>Lebanon City</u>
Connection Status <u>No Limitations</u>	County <u>Lebanon</u>
Date Application Received <u>June 25, 2021</u>	EPA Waived? <u>No</u>
Date Application Accepted <u>July 12, 2021</u>	If No, Reason <u>Major Facility, Pretreatment, Significant CB Discharge</u>
Purpose of Application <u>NPDES permit renewal for discharge of treated sewage</u>	

Summary of Review

1.0 General Discussion

This fact sheet supports the renewal of an existing NPDES permit for discharge of treated wastewater from City of Lebanon Authority (COLA) wastewater treatment plant (WWTP). COLA owns, operates, and maintains the wastewater treatment plant. The facility is located in North Cornwall Township, Lebanon County. The facility receives 44.35% of the flow from City of Lebanon, 4.02% of the flow Cleona Borough, 17.06% of the flow from North Cornwall Borough, 14.87% of the flow from North Lebanon Township, 10.14 % of the flow from South Lebanon Township, 0.75% of the flow from West Lebanon Township, 5.30 % of the flow from Cornwall Borough, 1.17% of the flow from South Annville Township, 1.37% of the flow from Heidelberg Township and 0.98% of the flow from West Cornwall Borough. The sewer collection system is not combined in these areas and there are no bypasses or overflows within the collection system. The treatment plant has a hydraulic design capacity of 11 MGD and an annual average flow of 8 MGD. The organic capacity of the facility is 22,350 lbs/day- BOD5. The discharge goes to Quittapahilla Creek via Outfall 001. Quittapahilla Creek is classified as trout stock fishery (TSF) and migratory fish (MF) in 25 PA Code, Chapter 93. Portion of the treated effluent is used by PPL Ironwood Electric Power Generating Plant as cooling water. The portion of effluent that goes to the stream is reported on DMRs and in the permit application. The existing NPDES permit was issued on December 23, 2016 with an effective date of January 1, 2017 and expiration date of December 31, 2021. The applicant submitted a timely NPDES renewal application to the Department and is currently operating under the terms and conditions of the existing permit. A topographic map showing the discharge location is presented in attachment A. A draft permit was issued on May 17, 2022, but the permittee had an opportunity to resample some pollutants that were reported as non-detect using a more sensitive analytical method. The permit is being re-drafted to include the new data. See section 4.4.12 of the factsheet for details.

Approve	Deny	Signatures	Date
X		<i>J. Pascal Kwedza</i> J. Pascal Kwedza, P.E. / Environmental Engineer	July 7, 2022
X		<i>Maria D. Bebenek for</i> Daniel W. Martin, P.E. / Environmental Engineer Manager	July 19, 2022
X		<i>Maria D. Bebenek</i> Maria D. Bebenek, P, E./ Program Manager	July 19, 2022

Summary of Review

1.1 Sludge use and disposal description and location(s):

Dried solids (class A biosolids) are stored in a silo on site until disposal by given away, agronomic application, and for sale. Dewatered solids (Class B) are sometimes applied to approved agricultural land application sites. Digested biosolids can also be applied in liquid form (Class B) to the approved agricultural sites.

1.2 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.

1.3.0 Changes to the existing permit

- Monthly E. Coli monitoring has been added
- Limitation on Total Copper and monitoring of Total Boron, Dissolved Iron and Total Zinc have been added.
- Motoring requirement for Total Dissolved Solids, Chloride and Bromide has been discontinued.

1.3.1 Existing Limitations and Monitoring Requirements

Discharge Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Monthly Average	Weekly Average	Minimum	Monthly Average	Weekly Average	Instantaneous 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	XXX	XXX	5.0	XXX	XXX	XXX	1/Day	Grab
TSS	2001	3002	XXX	30	45	60	1/Day	24-hr comp
CBOD ₅ (5/1 to 10/31)	667	1000	XXX	10	15	20	1/Day	24-hr comp
CBOD ₅ (11/1 to 4/30)	1334	2001	XXX	20	30	40	1/Day	24-hr comp
NH ₃ -N 5/1 to 10/31	166	XXX	XXX	2.5	XXX	5.0	1/Day	24-hr comp
NH ₃ -N 11/1 to 4/30	500	XXX	XXX	7.5	XXX	15.0	1/Day	24-hr comp
Fecal Coliform (5/1 to 9/30) ⁽⁵⁾	XXX	XXX	XXX	200	XXX	XXX	1/Day	Grab
Fecal Coliform (10/1 to 4/30)	XXX	XXX	XXX	2,000	XXX	XXX	1/Day	Grab
Total Phosphorus	133	XXX	XXX	2.0	XXX	4.0	1/Day	24-hr comp
Total Dissolved Solids	Report	XXX	XXX	Report	XXX	XXX	1/week	24-hr comp

Summary of Review

Chloride	Report	XXX	XXX	Report	XXX	XXX	1/week	24-hr comp
Bromide	Report	XXX	XXX	Report	XXX	XXX	1/week	24-hr comp
Sulfate	Report	XXX	XXX	Report	XXX	XXX	1/week	24-hr comp

1.3.2 Chesapeake Bay Limitations

Discharge Parameter	Effluent Limitations					Monitoring Requirements	
	Mass Load(lbs)		Concentrations (mg/l)			Minimum Measurement Frequency	Required Sample Type
	Monthly	Annual	Minimum	Monthly Average	Maximum		
Ammonia---N	Report	Report	XXX	Report	XXX	1/Day	24-hr Comp
Kjeldahl---N	Report	XXX	XXX	Report	XXX	1/Week	24-hr Comp
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	1/Week	24-hr Comp
Total Nitrogen	Report	Report	XXX	Report	XXX	1/Month	Calculate
Total Phosphorus	Report	Report	XXX	Report	XXX	1/Day	24-hr Comp
Net Total Nitrogen	Report	146,117	XXX	XXX	XXX	1/Month	Calculate
Net Total Phos.	Report	19,482	XXX	XXX	XXX	1/Month	Calculate

Outfall No.	001	Design Flow (MGD)	8
Latitude	40° 20' 15.13"	Longitude	-76° 27' 44.82"
Quad Name	Lebanon	Quad Code	1634
Wastewater Description: Sewage Effluent			

Receiving Waters	Quittapahilla Creek	Stream Code	09691
NHD Com ID	56398445	RMI	12.04
Drainage Area	32	Yield (cfs/mi²)	0.14
Q7-10 Flow (cfs)	4.16	Q7-10 Basis	
Elevation (ft)	424.50	Slope (ft/ft)	
Watershed No.	7-D	Chapter 93 Class.	TSF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Flow Alterations, Flow Alterations, Pathogens, Siltation		
Source(s) of Impairment	Agriculture, Agriculture, Source Unknown, Urban Runoff/Storm Sewers		
TMDL Status	Final	Name	Quittapahilla Creek Watershed

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

Nearest Downstream Public Water Supply Intake	PA American Water Company
PWS Waters <u>Swatara Creek</u>	Flow at Intake (cfs)
PWS RMI	Distance from Outfall (mi) <22

Changes Since Last Permit Issuance: None

1.4.1 Public Water Supply

The closest water supply intake located downstream from the discharge is by PA American Water Co. on Swatara Creek in South Hanover Township, Dauphin County. The distance downstream from the discharge to the intake is approximately 22 miles. No impact is expected from this discharge

1.4.2 Stormwater Outfalls

Outfall No.	002	Design Flow (MGD)	0
Latitude	40° 20' 9.00"	Longitude	-76° 27' 45.00"
Wastewater Description:	Stormwater		
Outfall No.	003	Design Flow (MGD)	0
Latitude	40° 20' 13.00"	Longitude	-76° 27' 47.00"
Wastewater Description:	Stormwater		
Outfall No.	004	Design Flow (MGD)	0
Latitude	40° 20' 15.00"	Longitude	-76° 27' 46.00"
Wastewater Description:	Stormwater		
Outfall No.	005	Design Flow (MGD)	0
Latitude	40° 20' 14.00"	Longitude	-76° 27' 31.00"
Wastewater Description:	Stormwater		

1.4.3 Other Comments:

The existing permit listed outfalls 002 (40°20'09"/76°27'45"), 003(40°20'13"/76°27'47"), 004 (40°20'15"/76°27'46") and 005 (40°20'14"/76°27'31") as receiving stormwater runoff from the treatment plant site. To comply with stormwater requirements of 40CFR 122.26(b)(14)(ix), part C of the permit will continue to require compliance with the standard requirements applicable to stormwater outfalls for 002, 003,004 and 005 with best management practices. Location of the outfalls and the receiving streams are as follows: 002 (40°20'09"/76°27'45) discharges to Snitz Creek north of the WWTP's dairy road entrance. 003 (40°20'13"/76°27'47") discharges to Snitz Creek, south of convergence of Snitz Creek and Quittapahilla Creek. 004 (40°20'15"/76°27'46") located on Quittapahilla Creek immediately upstream of outfall 001. 005 (40°20'14"/76°27'31") is located on Quittapahilla Creek upstream of outfall 001.

2,0 Treatment Facility Summary				
Treatment Facility Name: City Of Lebanon Authority WWTP				
WQM Permit No.		Issuance Date		
3896403 09-1		5/25/2010		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Activated Sludge With Solids Removal	UV	8
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
11	22350	Not Overloaded	Anaerobic Digestion	Land Application

Changes Since Last Permit Issuance: There is permit amendment application pending for the following project: New headworks building, installation of grit removal equipment, installation of centrate and digester decant holding tank, anaerobic digester renovations, control building renovations, replacement of disinfection back-up system and installation of new pump station for primary sludge / primary clarifier scum.

2.1 Treatment Plant Description

The facility consists of 2 mechanical screening units, grit removal, 2 primary clarifiers, 2 trickling filters, 2 intermediate clarifiers, 4 bioreactors to provide Modified MLE with IFAS nitrification/denitrification process, 4 final clarifiers, 8 denitrification filters, 4 UV systems for ultraviolet light disinfection and post-aeration. Primary and secondary anaerobic digesters, 2 centrifuges and a drier. Chlorine feed system and chlorine contact tanks are retained for emergency use.

2.2 Treatment Chemicals

- Methanol as carbon source for denitrification
- Chlorine as backup disinfection
- Poly-Aluminum chloride for phosphorus removal
- Magnesium Hydroxide for pH adjustment
- Polymer for biosolids dewatering
- Potassium Hydroxide for primary sludge line cleaning

3.0 Compliance History

3.1 DMR Data for Outfall 001 (from June 1, 2021 to May 31, 2022)

Parameter	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21
Flow (MGD)												
Average Monthly	6.741	6.561	5.487	5.915	5.139	4.851	5.471	5.403	8.278	4.778	5.022	4.717
Flow (MGD)												
Daily Maximum	11.210	8.454	5.894	9.450	5.988	5.004	6.848	7.224	16.806	5.844	6.634	5.116
pH (S.U.)												
Minimum	7.05	7.16	7.39	7.2	7.43	7.22	7.18	7.24	7.2	7.28	7.34	7.16
pH (S.U.)												
Maximum	8.00	7.93	7.98	7.91	8.06	8.16	7.95	8.04	7.96	8.18	8.10	8.04
DO (mg/L)												
Minimum	7.72	8.49	8.73	8.76	7.75	8.80	7.17	7.94	6.01	7.61	7.52	7.92
CBOD5 (lbs/day)												
Average Monthly	< 95.4	< 91.9	< 82.8	< 119.6	< 104.6	< 80.7	< 82.8	< 76.3	< 207.3	< 55.4	< 60	< 60.8
CBOD5 (lbs/day)												
Weekly Average	< 115.47	< 101.7	< 101.4	< 173.7	< 140.1	< 109.2	< 100.7	< 81.0	< 479.9	< 61.04	< 71.16	94.0
CBOD5 (mg/L)												
Average Monthly	< 2.2	< 2.2	< 2.6	< 2.8	< 3.4	< 2.5	< 2.5	< 2.1	< 2.9	< 2.1	< 2.1	< 2.25
CBOD5 (mg/L)												
Weekly Average	< 2.65	< 2.3	< 3.03	< 3.45	< 4.58	< 3.17	< 3.23	< 2.11	< 5.13	< 2.15	< 2.37	2.91
BOD5 (lbs/day)												
Raw Sewage Influent Ave. Monthly	17407	17246	18016	17483	18206.7	16985.8	16546	15224	17290	14697	15065	14484
BOD5 (lbs/day)												
Raw Sewage Influent Daily Maximum	23466	21508	25091	37672	25821.9	19857.1	22457	19369	23977	< 18196	20888	18513
BOD5 (mg/L)												
Raw Sewage Influent Ave. Monthly	317.7	318	395	356	425	420	365	342	271.8	370	363.2	368
TSS (lbs/day)												
Average Monthly	< 108.3	< 105.6	< 80.5	< 92.6	< 77.2	< 79.7	< 83	< 102.4	< 651.2	< 77.3	< 76.9	< 70.2
TSS (lbs/day)												
Raw Sewage Influent Ave. Monthly	11098	10892	10564	9826	10340	11057	10486	9670	12233	9599	10047	9073
TSS (lbs/day)												
Raw Sewage Influent Daily Maximum	15124	15909	15559	12897	13782	14079	13156	15356	20903	12525	20070	11563
TSS (lbs/day)												
Weekly Average	< 127.6	< 109.8	< 84.4	< 101.8	< 81.76	< 90.47	< 98.14	< 115.5	< 2367.4	< 85.1	< 113.4	< 82.78
TSS (mg/L)												
Average Monthly	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.51	< 2.74	< 6.89	< 2.9	< 2.7	< 2.62

TSS (mg/L) Raw Sewage Influent Ave. Monthly	203.4	201	231	203	241	273	231	216	187.3	241	241.5	230.9
TSS (mg/L) Weekly Average	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.53	< 3.09	< 21.3	< 3.4	< 3.2	< 3.03
Total Dissolved Solids (lbs/day) Ave. Monthly	19088	18645	14716	14217	15190	14093	13430.7	15774	25558	11844	14529	12025
Total Dissolved Solids (mg/L) Ave. Monthly	442.3	440	450.2	427.5	490	434.5	416.2	441	449.4	455.5	469	443.8
Fecal Coliform (CFU/100 ml) Geometric Mean	< 10	< 10	< 10	< 11	< 10	< 11	< 10	< 11	< 16	< 10	< 10	< 11
Fecal Coliform (CFU/100 ml) Instant. Maximum	30	10	10	41	10	86	< 10	31	1990	63	20	41
UV Transmittance (%) Minimum	68.9	66.6	64.7	65.8	51.5	53.5	61.7	65.6	65.7	66.3	59.3	63.4
Nitrate-Nitrite (mg/L) Average Monthly	5.12	4.74	4.53	3.95	6.4	< 7.83	4.91	6.93	6.475	5.10	8.74	5.48
Nitrate-Nitrite (lbs) Total Monthly	7745.9	5982.4	4583.5	4003.7	6078.4	7598.3	4591	7278.5	12883	4238.4	7787.7	4221.5
Total Nitrogen (mg/L) Average Monthly	7.45	6.96	6.38	5.57	8.82	9.74	6.73	8.47	9.309	6.24	9.863	7.75
Total Nitrogen (lbs) Effluent Net Total Monthly	11371.2	8819.7	6451.3	5589.1	8386.6	9454	6343.4	8915.2	19923.7	5168.4	9029.6	5976.6
Total Nitrogen (lbs) Total Monthly	11371.2	8819.7	6451.3	5589.1	8386.6	9454	6343.4	8915.2	19923.7	5168.4	9029.6	5976.6
Total Nitrogen (lbs) Effluent Net Total Annual									124113			
Total Nitrogen (lbs) Total Annual									124113			
Ammonia (lbs/day) Average Monthly	< 26.66	< 22.3	< 5.1	< 16.45	< 7.1	< 22	< 9.76	< 5.5	< 83.8	< 3.55	< 3.66	< 4.38
Ammonia (mg/L) Average Monthly	< 0.54	< 0.51	< 0.16	< 0.37	< 0.23	< 0.67	< 0.29	< 0.15	< 1.14	< 0.13	< 0.13	< 0.16
Ammonia (lbs) Total Monthly	< 826.5	< 669.1	< 158.5	< 460.6	< 218.8	< 680.5	< 292.9	< 169.8	< 2514.1	< 110	< 107.6	< 131.4
Ammonia (lbs) Total Annual									< 26292			
TKN (mg/L) Average Monthly	2.34	2.22	1.85	1.62	2.42	1.92	1.82	1.54	2.65	1.14	1.65	2.27
TKN (lbs) Total Monthly	3625.3	2837.3	1867.8	1585.4	2308.2	1855.6	1721.2	1636.7	6734.6	930	1547.5	1755.1

Total Phosphorus (lbs/day) Average Monthly	35.6	34.5	29.2	29.2	23.31	28.32	29.2	25.1	54.5	14.2	17.31	18.8
Total Phosphorus (mg/L) Average Monthly	0.85	0.82	0.90	0.79	0.75	0.9	0.88	0.68	0.81	0.53	0.63	0.69
Total Phosphorus (lbs) Effluent Net Total Monthly	1104.9	1035.6	903.3	817.6	722.5	877.8	875.3	779	1634.5	439.1	536.7	563.5
Total Phosphorus (lbs) Total Monthly	1104.9	1035.6	903.3	817.6	722.5	877.8	875.3	779	1634.5	439.1	536.7	563.5
Total Phosphorus (lbs) Effluent Net Total Annual									9697			
Total Phosphorus (lbs) Total Annual									9686			
Sulfate (lbs/day) Average Monthly	2065	2017	1516.81	1634	1545	1682.6	1804.4	1931	3069.7	1277	1392	1260.6
Sulfate (mg/L) Average Monthly	47.4	47.4	46.5	49.2	50	52.23	55.5	53.9	54.66	49.2	44.9	46.82
Chloride (lbs/day) Average Monthly	4175	4339	3585	3380	4068	3231.1	3111.6	3377	4774	2905	3178	2806
Chloride (mg/L) Average Monthly	96.2	101.7	110	102.6	131	100.15	96.3	94.6	84.4	112.8	103	105.12
Bromide (lbs/day) Average Monthly	< 1.00	< 42.6	< 32.7	< 33	< 31	< 32.14	< 32.5	< 1.00	< 57.6	< 26	< 31	< 27.04
Bromide (mg/L) Average Monthly	< 43.7	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 35.7	< 1.00	< 1.00	< 1.00	< 1.00

3.2 Effluent Violations for Outfall 001, from: April 1, 2021 to: February 28, 2022

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	09/30/21	IMAX	1990	CFU/100 ml	1000	CFU/100 ml

3.3 Summary of Discharge Monitoring Reports (DMRs):

DMRs review for the facility for the last 12 months of operation, presented on the table above in section 3.1 indicate permit limits have been met consistently. One Fecal Coliform effluent violations was noted on DMRs during the period reviewed and presented in section 3.2. The violation appear to be a onetime occurrence.

3.4 Summary of Inspections:

The facility has been inspected a couple times during last permit cycle. No effluent violations were found during plant inspections. The facility is operated and well maintained.

4.0 Development of Effluent Limitations

Outfall No.	001	Design Flow (MGD)	8
Latitude	40° 20' 14.72"	Longitude	-76° 27' 43.77"
Wastewater Description:	Sewage Effluent		

4.1 Basis for Effluent Limitations

In general, the CWA requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

4.2 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)

Comments: UV disinfection is utilized. Daily UV light transmittance monitoring in the existing permit will be continued to ensure UV performance efficiency.

4.3 Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass based limits are expressed in pounds per day and are calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34

4.4 Water Quality-Based Limitations

4.4.1 Receiving Stream

The receiving stream is the Quittapahilla Creek. According to 25 PA § 93.9o, this stream is protected for TSF and MF. It is located in Drainage List o and State Watershed 7-D. It has been assigned stream code 09691. According to the Department's Integrated Water Quality Monitoring and Assessment Report, Quittapahilla Creek watershed is impaired for flow alterations, pathogens, siltation and urban runoff. Source is agriculture, unknown and storm sewers respectively. TMDL is completed and approved by EPA in 2001. See section 5.4 of the report for further discussion.

4.4.2 Stream flows

The Technical Support Document for Water Quality-Based Toxics Control (TSD) (EPA, 1991) and the Pennsylvania Water Quality Standards PA WQS) recommend calculating water quality-based effluent limits (WQBELs) using steady-state modeling and the flow conditions. The TSD and the PA WQS state that WQBELs intended to protect aquatic life uses

should be based on the lowest seven-day average flow rate expected to occur once every ten years (Q_{7-10}) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years (Q_{1-10}) for acute criteria and Q_{30-10} for the chronic ammonia criterion instead of the Q_{7-10} . The Q_{30-10} is a biologically based design flow intended to ensure an excursion frequency of once every three years for a 30-day average flow rate. These flows were determined by correlating with the yield of USGS gage No. 01573560 on Swatara Creek near Hershey. The Q_{7-10} and drainage area at the gage is 67.7ft³/s and 483mi² respectively. The resulting yields are as follows:

- $Q_{7-10} = (67.7\text{ft}^3/\text{s})/483 \text{ mi}^2 = 0.14\text{ft}^3/\text{s}/\text{mi}^2$
- $Q_{30-10} / Q_{7-10} = 0.89$
- $Q_{1-10} / Q_{7-10} = 1.23$

The drainage area at the point of discharge taken from the previous protection report is 32 mi².

The Q_{7-10} at discharge = 32 mi² x 0.14 ft³/s/mi² = 4.48 ft³/s.

4.4.3 NH₃N Calculations

NH₃N calculations will be based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The following data is necessary to determine the instream NH₃N criteria used in the attached computer model of the stream:

- | | |
|---------------------------------|--|
| • Discharge pH | = 7.2 (DMR median) |
| • Discharge Temperature | = 25 ° C (Default) |
| • Stream pH | = 7.8 (WQN Station on Quittapahilla Creek) |
| • Stream Temperature | = 19 °C (WQN Station on Quittapahilla Creek) |
| • Background NH ₃ -N | = 0.0 (default) |

4.4.4 CBOD₅

WQM 7.0 is a wasteload allocation program that DEP uses to develop WQBELs for Carbonaceous BOD, Dissolved Oxygen, and Ammonia-Nitrogen. The attached results of the WQM 7.0 stream model (attachment B) indicates that, a summer average monthly limit of 19.29 mg/l CBOD₅ is required to protect the water quality of the stream. This is less stringent than the existing permit limitation for summer months and will not be written in the permit due to anti-backsliding restrictions. The existing summer average monthly limit(AML) of 10mg/l, average weekly limit (AWL) of 15mg/l and IMAX of 20 mg/l with the existing AML of 20 mg/l, AWL of 30 mg/l and IMAX of 40 mg/l for winter months will remain in the permit. Past DMRs and inspection reports show the STP has been consistently achieving below 10 mg/l CBOD₅ for both summer and winter months. Mass limits are calculated using the equation presented in section 4.3.

4.4.5 NH₃-N

The attached results of WQM 7.0 stream model (attachment B) indicates a summer monthly average of 1.8 mg/l of NH₃ and a winter limit of 3.6mg/l are necessary to protect the aquatic life from toxicity effects. This limit is consistent with the existing limit and the facility is meeting the limits. Winter limit is three times the summer limits. Mass limits are calculated using the equation presented in section 4.3.

4.4.6 Dissolved Oxygen

The existing permit contains a limit of 5 mg/l for Dissolved Oxygen (DO). DEP's Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001, 10/97) suggests that either the adopted minimum stream D.O. criteria for the receiving stream or the effluent level determined through water quality modeling be used for the limit. Since the WQM 7.0 model was run using a minimum D.O. of 5.0 mg/l, this limit will be continued in the renewed permit with a daily monitoring requirement.

4.4.7 Total Suspended Solids (TSS):

There is no water quality criteria for TSS. A limit of 30 mg/l AML in the existing permit which was based on the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR 133.102b(1) and 25 PA § 92a.47(a)(1) and an AWL of 45mg/l per 40CFR 133.102(b)(2) and 25 PA § 92a.47(a)(2) with associated mass limits will remain in the permit. Mass limits are calculated using the equation presented in section 4.3.

4.4.8 Phosphorus

The average monthly limit of 2mg/l phosphorus in the existing permit was based on the requirement to control phosphorus loading to Lower Susquehanna River Basin. That requirement has been superseded by the development of Chesapeake Bay TMDL in 2010, however due to anti-backsliding restrictions the limit will remain in the permit. Mass limits are calculated using the equation presented in section 4.3.

4.4.9 Chesapeake Bay Strategy:

The Department formulated a strategy in April 2007, to comply with the EPA and Chesapeake Bay requirements to reduce point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP) to the Bay. In the Strategy, sewage dischargers have been prioritized by DEP based on their delivered TN loadings to the Bay. The highest priority (Phases 1, 2, and 3) dischargers received annual loading caps based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. Phase 4 (0.2 -0.4mgd) and Phase 5(below 0.2mgd) are required to monitor and report TN and TP during permit renewal and any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away. EPA published Chesapeake Bay TMDL in December of 2010. In order to address the TMDL, Pennsylvania developed Chesapeake Watershed Implementation Plan (WIP) Phase 1, Phase 2 and currently Phase 3 WIP and a supplement to the WIPs to be implemented with the original Chesapeake Bay Strategy.

As outlined in the current Phase 3 WIP and the current supplement to the WIP, re-issuing permits for significant dischargers would follow the same phased approach formulated in the original Bay strategy whilst Phase 4 and Phase 5 will be required to monitor and report TN and TP during permit renewals

This facility falls in phase 1 of the strategy and is required to meet a total maximum annual Total Nitrogen Cap load of 146,117 lbs/year based on a design annual wasteflow of 8 MGD and 6 mg/l total nitrogen and a TP cap load of 18,482 lbs/year based on annual wasteflow of 8 MGD and 0.8 mg/l total phosphorus. The facility is in compliance with the bay cap load requirements.

The Department approved a total nitrogen offset of 10,375lbs of nitrogen based on 415EDUs at 25lbs/EDU for COLA. The offsets is for 415 EDUs on-lot disposal systems that have been connected to the sewer conveyance system. These on-lot systems were put into use prior to January 1, 2003 and retired after January 1, 2003. The approved offsets are only for compliance purposes and are not available for trading or selling and will not be added to the base TN cap load. The permit will show the base cap load on the effluent page and show the offsets as a foot note with a language indicating the offsets may be applied throughout the compliance year or during the truing period. A complete list of addresses of the dwellings that were served by the retired on-lot systems that are now connected to the sewage conveyance system is on file.

4.4.10 Total Residual Chlorine

The flooding of 2011 damaged the UV system of the facility and chlorine was used for disinfection until a new UV system was installed during plant upgrade. The permittee requested to retain the chlorine system to use when Quittapahilla Creek rises due to heavy rain and threatens UV equipment destruction. The permittee proposed to pull out UV modules when the creek elevation reaches the top of the wing wall (elevation of 423.55") and the plant flow elevation reaches the top of the aluminum pad in the UV tank (elevation of 424.30") and use chlorine for disinfection. Chlorine samples will be collected per shift anytime chlorine is used for emergency disinfection. Results shall be submitted to the Department on supplemental DMR forms. The Department should be notified within 24 hours of using chlorine for disinfection. The emergency chlorination system shall be used in accordance with the standard operating procedures submitted to the Department.

The attached TRC result presented in attachment E utilizes the equations and calculations as presented in the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID No. 391-2000-015) for developing chlorine limitations. The Guidance references Chapter 92a, Section 92a.48 (b) which establishes a standard BAT limit of 0.5 mg/l unless a facility-specific BAT has been developed. The attached result indicates that a water quality limit of 0.1 mg/l and 0.20mg/l IMAX would be needed to prevent toxicity concerns. Since chlorine is only used in an emergency, TRC limitation and monitoring requirements will be placed in part c of the permit.

4.4.11 Fecal Coliform and E. Coli

The existing Fecal Coliform limit is consistent with the technology limits recommended in 92a.47(a)(4) and (a)(5) and will remain in the permit. In March of 2021, EPA approved DEP's Triennial Review of Water Quality Standards, which included a new swimming season criterion for E. coli. As a result, DEP is including monitoring requirements for E. Coli in new and

renewed sewage permits above 2000gpd. Monitoring frequency is based on annual average flow as follows: 1/month for design flows ≥ 1 MGD, 1/quarter for design flows ≥ 0.05 and < 1 MGD and 1/year for design flows of 0.002 – 0.05 MGD. Your discharge of 8 MGD requires 1/month monitoring as included in the permit.

4.4.12 Toxics

A reasonable potential (RP) analysis was done for pollutants re-sampled in support of the permit renewal application. All pollutants that were presented in the original application sampling data and the re-sampled ones were entered into DEP's Toxics Management Spreadsheet (TMS) to calculate WQBELs. The results of the TMS analysis are presented in attachment C. Permit limit is recommended for Total Copper and monitoring is recommended for Total Zinc, Total Boron and Dissolved Iron. The permit will be drafted with 2/month monitoring for Total Zinc, Total Boron and Dissolved Iron and the recommended limit of 0.024mg/l AML for Total Copper with a sample frequency of 1/week.

The recommended limitations follow the logic presented in DEPs SOP, to establish limits in the permit where the maximum reported concentration exceeds 50% of the WQBEL, or for non-conservative pollutants to establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL, or to establish monitoring requirements for conservative pollutants where the maximum reported concentration is between 10% - 50% of the WQBEL.

4.4.13 TDS, Chloride, Sulfate, Bromide

The existing monitoring requirement for TDS, Chloride, Sulfate, and Bromide will be discontinued in the permit. Adequate data has been collected for this facility.

4.4.14 Influent BOD and TSS Monitoring

The permit will include influent BOD5 and TSS monitoring at the same frequency as is done for effluent in order to implement Chapter 94.12 and assess percent removal requirements.

4.4.15 Industrial Users

COLA WWTP receives wastewater from the following industries: Greater Lebanon Refuse Authority (Landfill), Swiss Premium Dairy (milk processing facility), Murry's Inc. (food processor – bulk meat products; cooking packing and processing), and Godshall's Quality Meats. Some of the industries are considered significant industrial source.

4.4.16 Pretreatment Requirements

COLA currently maintains and operates an EPA-approved pretreatment program. Consequently, the Department will continue to include permit conditions that dictate the operation and implementation of a pretreatment program in the permit.

4.4.17 Biosolids Management

Biosolids treatment is a two-stage high- rate anaerobic digestion process. Sludge from primary clarifiers, intermediate clarifiers and the final clarifiers is pumped to a complete- mix heated, primary anaerobic digester. Primary digested sludge is hydraulically displaced to the secondary anaerobic digester. Digested biosolids are normally dewatered by centrifuge and dried using Komline-Sanderson indirect heat continuous feed drier.

5.0 Other Requirements

5.1 Anti-backsliding

Not applicable to this permit

5.2 Anti-Degradation (93.4)

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

5.3 Class A Wild Trout Fisheries

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

5.4 303d Listed Streams

The discharge is located on a stream segment that is designated on the 303(d) list as impaired, and the impairment is due to suspended solids and siltation from urban runoff and agricultural activities in the watershed. Sediment TMDL for Quittapahilla Creek was approved in 2001. Point sources were not included in the evaluation. Reduction in point source loadings below current permit levels is not appropriate at this time since the impairment is related to nonpoint sources.

5.5 Special Permit Conditions

The permit contains the following special conditions:

- Stormwater Prohibition, Approval Contingencies, Solids Management, Restriction on receipt of hauled in waste under certain conditions, Pretreatment implementation, Chlorine minimization and Storm water requirement

5.6 Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs).

5.7 Effluent Monitoring Frequency

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

6.0 Whole Effluent Toxicity (WET)

Whole Effluent Toxicity (WET) is a term used to describe the aggregate toxic effect of an aqueous sample (i.e whole effluent wastewater discharge) as measured by an organism's response upon exposure to the sample (lethality, impaired growth or reproduction). WET tests replicate, to the greatest extent possible, the total effect and actual environmental exposure of aquatic life to toxic pollutants in an effluent without requiring the identification of the specific pollutants. WET testing is a vital component of the water quality standards implementation through the NPDES permitting process. EPA's promulgated WET test methods include acute and chronic tests.

6.1 For Outfall 001, ☐ Acute ☒ Chronic WET Testing was completed:

- ☒ For the permit renewal application (4 tests).
- ☐ Quarterly throughout the permit term.
- ☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
- ☐ Other:

The dilution series used for the tests was: 100%, 86%, 74%, 63%, and 54%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 74.

6.2 Summary of Four Most Recent Test Results

TST Data Analysis

WET Summary and Evaluation					
Facility Name	City of Lebanon Authority WWTP				
Permit No.	PA0027316				
Design Flow (MGD)	8				
Q₇₋₁₀ Flow (cfs)	4.48				
PMF_a	1				
PMF_c	1				

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
		10/9/18	7/27/19	10/27/20	5/10/21
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
		10/9/18	9/24/19	10/27/20	5/11/21
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
		10/9/18	9/24/19	10/27/20	5/10/21
Pimephales	Survival	PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
		10/9/18	9/24/19	10/27/20	5/10/21
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type Chronic

TIWC 73 % Effluent

Dilution Series 18, 37, 73, 87, 100 % Effluent

Permit Limit None

Permit Limit Species

See attachment D for additional TST data analysis

* A "passing" result is that in which the replicate data for the TIWC is not statistically significant from the control condition. This is exhibited when the calculated *t* value ("T-Test Result") is greater than the critical *t* value. A "failing" result is exhibited when the calculated *t* value ("T-Test Result") is less than the critical *t* value.

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).

☐ YES ☒ NO

6.3 Evaluation of Test Type, IWC and Dilution Series for Renewed Permit

Acute Partial Mix Factor (PMFa): **1**

Chronic Partial Mix Factor (PMFc): **1**

6.3. 1. Determine IWC – Acute (IWCa):

$$(Q_d \times 1.547) / ((Q_{7-10} \times \text{PMFa}) + (Q_d \times 1.547))$$

$$[(8.0 \text{ MGD} \times 1.547) / ((4.48 \text{ cfs} \times 1) + (8.0 \text{ MGD} \times 1.547))] \times 100 = \mathbf{73.42\%}$$

Is IWCa < 1%? ☐ YES ☒ NO (YES - Acute Tests Required OR NO - Chronic Tests Required)

If the discharge is to the tidal portion of the Delaware River, indicate how the type of test was determined:

N/A

Type of Test for Permit Renewal: Chronic Test

6.3.2a. Determine Target IWCa (If Acute Tests Required)

N/A

6.3.2b. Determine Target IWCC (If Chronic Tests Required)

$$(Q_d \times 1.547) / (Q_{7-10} \times \text{PMFc}) + (Q_d \times 1.547)$$

$$[(8.0 \text{ MGD} \times 1.547) / ((4.48 \text{ cfs} \times 1) + (8.0 \text{ MGD} \times 1.547))] \times 100 = 0.7342 = 73\%$$

6.3. 3. Determine Dilution Series

(NOTE – check Attachment C of WET SOP for dilution series based on TIWCa or TIWCC, whichever applies).

Dilution Series = 100%, 87%, 73%, 37%, and 18%.

6.4 WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

Will WET limits be established in the permit? ☐ YES ☒ NO

If WET limits will be established, identify the species and the limit values for the permit (TU).

N/A

If WET limits will not be established, but reasonable potential was determined, indicate the rationale for not establishing WET limits:

N/A

No WETT limit or monitoring is deemed necessary. The standard Part C condition for WET testing will be included in the permit.

7.0 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	Daily 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 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5) Nov 1 - Apr 30	1334	2001	XXX	20	30	40	1/day	24-Hr Composite
Carbonaceous Biochemical Oxygen Demand (CBOD5) May 1 - Oct 31	667	1000	XXX	10	15	20	1/day	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/day	24-Hr Composite
Total Suspended Solids	2001	3002	XXX	30	45	60	1/day	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/day	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/day	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/day	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
Ultraviolet light transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded
Ammonia-Nitrogen Nov 1 - Apr 30	360	XXX	XXX	5.4	XXX	10.8	1/day	24-Hr Composite

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Daily Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia-Nitrogen May 1 - Oct 31	120	XXX	XXX	1.8	XXX	3.6	1/day	24-Hr Composite
Total Phosphorus	133	XXX	XXX	2.0	XXX	4	1/day	24-Hr Composite
Boron, Total	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Copper, Total	1.6	XXX	XXX	0.024	XXX	0.06	1/week	24-Hr Composite
Iron, Dissolved	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Zinc, Total	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite

Compliance Sampling Location: At Outfall 001

7.1 Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, to comply with Pennsylvania's Chesapeake Bay Tributary Strategy.

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

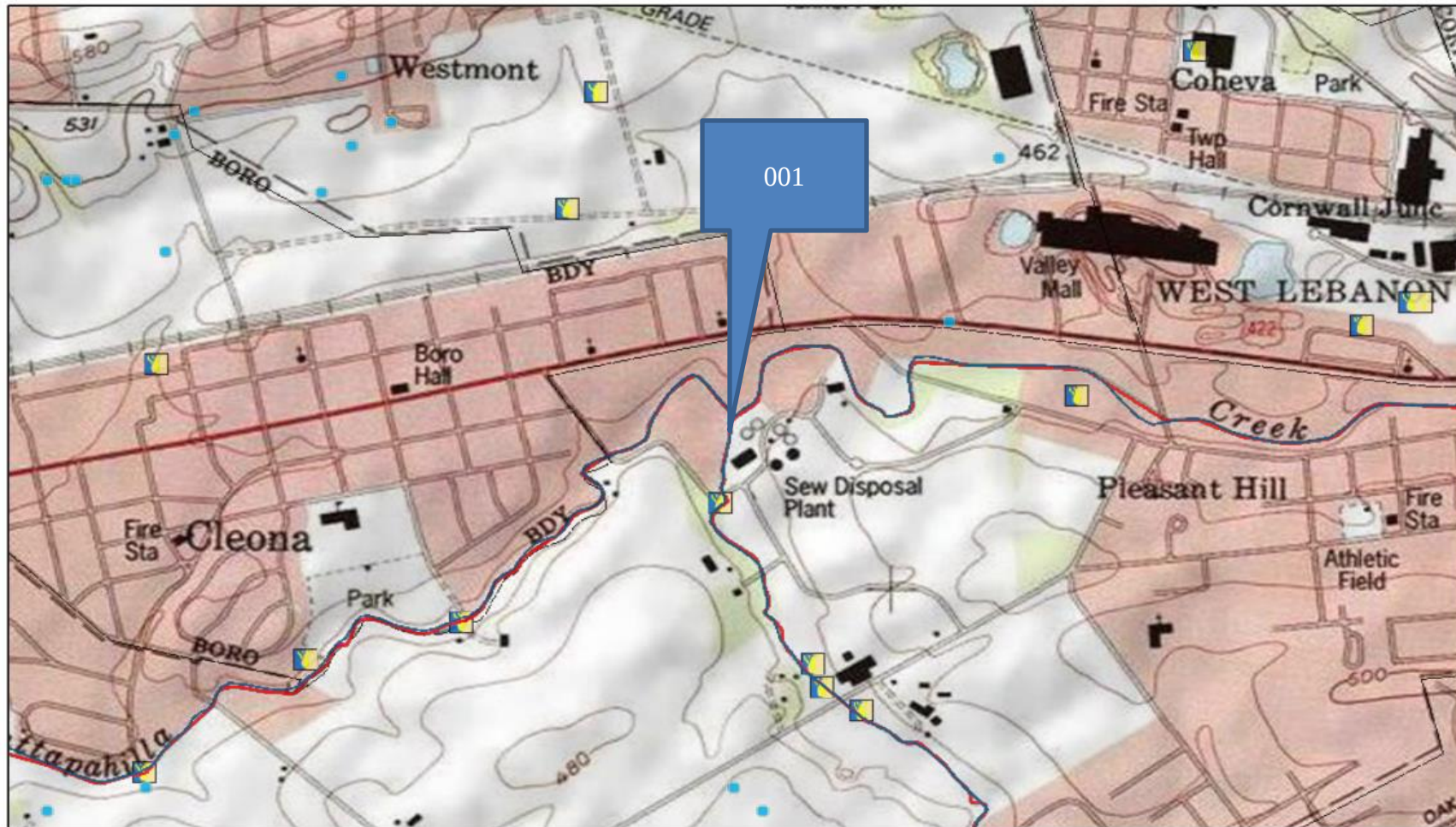
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Total Nitrogen (lbs) Effluent Net	XXX	146117 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Nitrogen (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Ammonia (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs) Effluent Net	XXX	19482 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: At Outfall 001

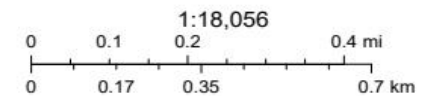
8.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment B)
☒	Toxics Management Spreadsheet (see Attachment C)
☒	TRC Model Spreadsheet (see Attachment D)
☐	Temperature Model Spreadsheet (see Attachment E)
☒	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	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: Establishment of effluent limit for individual sewage permit, WET Test analysis
☐	Other: F

9. Attachments

A. Topographical Map



May 1, 2022



B. WQM Model Results

WQM 7.0 Effluent Limits

<u>SWP Basin</u>		<u>Stream Code</u>	<u>Stream Name</u>				
07D		9691	QUITTAPAHILLA CREEK				
RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
12.040	City of Leb Aut	PA0027316	8.000	CBOD5	19.29		
				NH3-N	1.89	3.78	
				Dissolved Oxygen			5

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07D	9691	QUITTAPAHILLA CREEK	12.040	424.50	32.00	0.00000	0.00	☒

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	pH	Stream Temp (°C)	pH
	(cfsm)	(cfs)	(cfs)									
Q7-10	0.140	0.00	0.00	0.000	0.000	0.0	0.00	0.00	19.00	7.80	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
City of Leb Aut	PA0027316	8.0000	8.0000	8.0000	0.000	25.00	7.20

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	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
07D	9691	QUITTAPAHILLA CREEK	10.100	400.00	35.00	0.00000	0.00	☒

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	pH	Stream Temp (°C)	pH
	(cfsm)	(cfs)	(cfs)									
Q7-10	0.140	0.00	0.00	0.000	0.000	0.0	0.00	0.00	19.00	7.80	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	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
07D	9691	QUITTAPAHILLA CREEK

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
12.040	City of Leb Aut	9.22	12.19	9.22	12.19	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
12.040	City of Leb Aut	1.31	1.89	1.31	1.89	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	<u>CBOD5</u>		<u>NH3-N</u>		<u>Dissolved Oxygen</u>		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
12.04	City of Leb Aut	19.29	19.29	1.89	1.89	5	5	0	0

WQM 7.0 D.O.Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
07D	9691	QUITTAPAHILLA CREEK		
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
12.040	8.000	23.405	7.296	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
48.829	0.770	63.429	0.448	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
14.70	1.108	1.39	0.910	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
5.862	7.935	Tsivoglou	5	
<u>Reach Travel Time (days)</u>	Subreach Results			
0.264	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>
	0.026	14.20	1.36	5.58
	0.053	13.72	1.33	5.37
	0.079	13.26	1.29	5.23
	0.106	12.81	1.26	5.14
	0.132	12.38	1.23	5.09
	0.159	11.97	1.20	5.07
	0.185	11.56	1.18	5.08
	0.212	11.17	1.15	5.11
	0.238	10.80	1.12	5.15
	0.264	10.44	1.09	5.20

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	0.89	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.23	Temperature Adjust Kr	☒
D.O. Saturation	90.00%	Use Balanced Technology	☒
D.O. Goal	5		

WQM 7.0 Hydrodynamic Outputs

<u>SWP Basin</u>		<u>Stream Code</u>				<u>Stream Name</u>						
07D		9691				QUITTAPAHILLA CREEK						
RMI	Stream Flow	PWS With	Net Stream Flow	Disc Analysis Flow	Reach Slope	Depth	Width	W/D Ratio	Velocity	Reach Trav Time	Analysis Temp	Analysis pH
	(cfs)	(cfs)	(cfs)	(cfs)	(ft/ft)	(ft)	(ft)		(fps)	(days)	(°C)	
Q7-10 Flow												
12.040	4.48	0.00	4.48	12.376	0.00239	.77	48.83	63.43	0.45	0.264	23.41	7.30
Q1-10 Flow												
12.040	3.99	0.00	3.99	12.376	0.00239	NA	NA	NA	0.44	0.269	23.54	7.29
Q30-10 Flow												
12.040	5.51	0.00	5.51	12.376	0.00239	NA	NA	NA	0.46	0.256	23.15	7.31

C. Toxic Management Spreadsheet



Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions Discharge Stream

Facility: City of Lebanon Authority NPDES Permit No.: PA0027316 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
8	178	7.2						

				0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc	Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L	577									
	Chloride (PWS)	mg/L	197									
	Bromide	mg/L	< 2									
	Sulfate (PWS)	mg/L	88									
	Fluoride (PWS)	mg/L										
Group 2	Total Aluminum	µg/L	70									
	Total Antimony	µg/L	0.4									
	Total Arsenic	µg/L	< 1									
	Total Barium	µg/L	7									
	Total Beryllium	µg/L	< 1									
	Total Boron	µg/L	300									
	Total Cadmium	µg/L	< 0.2									
	Total Chromium (III)	µg/L	1.5									
	Hexavalent Chromium	µg/L	0.25									
	Total Cobalt	µg/L	0.6									
	Total Copper	µg/L	13									
	Free Cyanide	µg/L	1									
	Total Cyanide	µg/L	< 4									
	Dissolved Iron	µg/L	60									
	Total Iron	µg/L	80									
	Total Lead	µg/L	< 1									
	Total Manganese	µg/L	34									
	Total Mercury	µg/L	< 0.2									
	Total Nickel	µg/L	5.2									
	Total Phenols (Phenolics) (PWS)	µg/L	16									
	Total Selenium	µg/L	< 1									
	Total Silver	µg/L	< 0.5									
	Total Thallium	µg/L	< 1									
	Total Zinc	µg/L	41									
	Total Molybdenum	µg/L	4									
	Acrolein	µg/L	< 2									
	Acrylamide	µg/L	< 2									
	Acrylonitrile	µg/L	< 2									
	Benzene	µg/L	< 0.5									
	Bromoform	µg/L	< 0.5									

[illegible]

	2,6-Dinitrotoluene	µg/L	<	5															
	Di-n-Octyl Phthalate	µg/L	<	5															
	1,2-Diphenylhydrazine	µg/L	<	5															
	Fluoranthene	µg/L	<	2.5															
	Fluorene	µg/L	<	2.5															
	Hexachlorobenzene	µg/L	<	5															
	Hexachlorobutadiene	µg/L	<	0.5															
	Hexachlorocyclopentadiene	µg/L	<	5															
	Hexachloroethane	µg/L	<	5															
	Indeno(1,2,3-cd)Pyrene	µg/L	<	2.5															
	Isophorone	µg/L	<	5															
	Naphthalene	µg/L	<	0.5															
	Nitrobenzene	µg/L	<	5															
	n-Nitrosodimethylamine	µg/L	<	5															
	n-Nitrosodi-n-Propylamine	µg/L	<	5															
	n-Nitrosodiphenylamine	µg/L	<	5															
	Phenanthrene	µg/L	<	2.5															
	Pyrene	µg/L	<	2.5															
	1,2,4-Trichlorobenzene	µg/L	<	0.5															
Group 6	Aldrin	µg/L	<	0.05															
	alpha-BHC	µg/L	<	0.05															
	beta-BHC	µg/L	<	0.05															
	gamma-BHC	µg/L	<	0.05															
	delta BHC	µg/L	<	0.05															
	Chlordane	µg/L	<	0.05															
	4,4-DDT	µg/L	<	0.05															
	4,4-DDE	µg/L	<	0.05															
	4,4-DDD	µg/L	<	0.05															
	Dieldrin	µg/L	<	0.05															
	alpha-Endosulfan	µg/L	<	0.05															
	beta-Endosulfan	µg/L	<	0.05															
	Endosulfan Sulfate	µg/L	<	0.05															
	Endrin	µg/L	<	0.05															
	Endrin Aldehyde	µg/L	<	0.05															
	Heptachlor	µg/L	<	0.05															
	Heptachlor Epoxide	µg/L	<	0.05															
	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																	

Stream / Surface Water Information

City of Lebanon Authority, NPDES Permit No. PA0027316, Outfall 001

Instructions Discharge **Stream**

Receiving Surface Water Name: Quittapahilla 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	009691	12.04	424.5	32			Yes
End of Reach 1	009691	10.1	400	36			Yes

Q₇₋₁₀

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	12.04	0.14										308	7.8		
End of Reach 1	10.1	0.14													

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	12.04														
End of Reach 1	10.1														

Model Results

City of Lebanon Authority, NPDES Permit No. PA0027316, Outfall 001

Instructions

Results

RETURN TO INPUTS

SAVE AS PDF

PRINT

☐ All

☒ Inputs

☐ Results

☐ Limits

☐ Hydrodynamics

☒ Wasteload Allocations

☒ AFC

CCT (min): 6.988

PMF: 1

Analysis Hardness (mg/l): 212.55

Analysis pH: 7.30

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	1,021	
Total Antimony	0	0		0	1,100	1,100	1,498	
Total Arsenic	0	0		0	340	340	463	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	28,602	
Total Boron	0	0		0	8,100	8,100	11,032	
Total Cadmium	0	0		0	4.189	4.59	6.25	Chem Translator of 0.912 applied
Total Chromium (III)	0	0		0	1056.544	3,343	4,554	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	22.2	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	129	
Total Copper	0	0		0	27.347	28.5	38.8	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	30.0	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	145.219	213	290	Chem Translator of 0.681 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	2.24	Chem Translator of 0.85 applied
Total Nickel	0	0		0	886.134	888	1,209	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	11.767	13.8	18.9	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	88.5	
Total Zinc	0	0		0	221.981	227	309	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	4.09	

Acrylonitrile	0	0		0	650	650	885
Benzene	0	0		0	640	640	872
Bromoform	0	0		0	1,800	1,800	2,452
Carbon Tetrachloride	0	0		0	2,800	2,800	3,814
Chlorobenzene	0	0		0	1,200	1,200	1,634
Chlorodibromomethane	0	0		0	N/A	N/A	N/A
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	24,516
Chloroform	0	0		0	1,900	1,900	2,588
Dichlorobromomethane	0	0		0	N/A	N/A	N/A
1,2-Dichloroethane	0	0		0	15,000	15,000	20,430
1,1-Dichloroethylene	0	0		0	7,500	7,500	10,215
1,2-Dichloropropane	0	0		0	11,000	11,000	14,982
1,3-Dichloropropylene	0	0		0	310	310	422
Ethylbenzene	0	0		0	2,900	2,900	3,950
Methyl Bromide	0	0		0	550	550	749
Methyl Chloride	0	0		0	28,000	28,000	38,136
Methylene Chloride	0	0		0	12,000	12,000	16,344
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	1,362
Tetrachloroethylene	0	0		0	700	700	953
Toluene	0	0		0	1,700	1,700	2,315
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	9,262
1,1,1-Trichloroethane	0	0		0	3,000	3,000	4,086
1,1,2-Trichloroethane	0	0		0	3,400	3,400	4,631
Trichloroethylene	0	0		0	2,300	2,300	3,133
Vinyl Chloride	0	0		0	N/A	N/A	N/A
2-Chlorophenol	0	0		0	560	560	763
2,4-Dichlorophenol	0	0		0	1,700	1,700	2,315
2,4-Dimethylphenol	0	0		0	660	660	899
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	109
2,4-Dinitrophenol	0	0		0	660	660	899
2-Nitrophenol	0	0		0	8,000	8,000	10,896
4-Nitrophenol	0	0		0	2,300	2,300	3,133
p-Chloro-m-Cresol	0	0		0	160	160	218
Pentachlorophenol	0	0		0	11.750	11.8	16.0
Phenol	0	0		0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0		0	460	460	627
Acenaphthene	0	0		0	83	83.0	113
Anthracene	0	0		0	N/A	N/A	N/A
Benzidine	0	0		0	300	300	409
Benzo(a)Anthracene	0	0		0	0.5	0.5	0.68
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	40,860
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	6,129
4-Bromophenyl Phenyl Ether	0	0		0	270	270	368
Butyl Benzyl Phthalate	0	0		0	140	140	191

2-Chloronaphthalene	0	0		0	N/A	N/A	N/A
Chrysene	0	0		0	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A
1,2-Dichlorobenzene	0	0		0	820	820	1,117
1,3-Dichlorobenzene	0	0		0	350	350	477
1,4-Dichlorobenzene	0	0		0	730	730	994
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A
Diethyl Phthalate	0	0		0	4,000	4,000	5,448
Dimethyl Phthalate	0	0		0	2,500	2,500	3,405
Di-n-Butyl Phthalate	0	0		0	110	110	150
2,4-Dinitrotoluene	0	0		0	1,600	1,600	2,179
2,6-Dinitrotoluene	0	0		0	990	990	1,348
1,2-Diphenylhydrazine	0	0		0	15	15.0	20.4
Fluoranthene	0	0		0	200	200	272
Fluorene	0	0		0	N/A	N/A	N/A
Hexachlorobenzene	0	0		0	N/A	N/A	N/A
Hexachlorobutadiene	0	0		0	10	10.0	13.6
Hexachlorocyclopentadiene	0	0		0	5	5.0	6.81
Hexachloroethane	0	0		0	60	60.0	81.7
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A
Isophorone	0	0		0	10,000	10,000	13,620
Naphthalene	0	0		0	140	140	191
Nitrobenzene	0	0		0	4,000	4,000	5,448
n-Nitrosodimethylamine	0	0		0	17,000	17,000	23,154
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A
n-Nitrosodiphenylamine	0	0		0	300	300	409
Phenanthrene	0	0		0	5	5.0	6.81
Pyrene	0	0		0	N/A	N/A	N/A
1,2,4-Trichlorobenzene	0	0		0	130	130	177
Aldrin	0	0		0	3	3.0	4.09
alpha-BHC	0	0		0	N/A	N/A	N/A
beta-BHC	0	0		0	N/A	N/A	N/A
gamma-BHC	0	0		0	0.95	0.95	1.29
Chlordane	0	0		0	2.4	2.4	3.27
4,4-DDT	0	0		0	1.1	1.1	1.5
4,4-DDE	0	0		0	1.1	1.1	1.5
4,4-DDD	0	0		0	1.1	1.1	1.5
Dieldrin	0	0		0	0.24	0.24	0.33
alpha-Endosulfan	0	0		0	0.22	0.22	0.3
beta-Endosulfan	0	0		0	0.22	0.22	0.3
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A
Endrin	0	0		0	0.086	0.086	0.12
Endrin Aldehyde	0	0		0	N/A	N/A	N/A
Heptachlor	0	0		0	0.52	0.52	0.71
Heptachlor Epoxide	0	0		0	0.5	0.5	0.68

☒ CFC

CCT (min): 6.988

PMF: 1

Analysis Hardness (mg/l): 212.55

Analysis pH: 7.30

Model Results

7/6/2022

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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	300	
Total Arsenic	0	0		0	150	150	204	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	5,584	
Total Boron	0	0		0	1,600	1,600	2,179	
Total Cadmium	0	0		0	0.415	0.47	0.64	Chem Translator of 0.877 applied
Total Chromium (III)	0	0		0	137.435	160	218	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	14.2	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	25.9	
Total Copper	0	0		0	17.058	17.8	24.2	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	7.08	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	2,043	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	5.659	8.31	11.3	Chem Translator of 0.681 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	1.23	Chem Translator of 0.85 applied
Total Nickel	0	0		0	98.422	98.7	134	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	6.8	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	17.7	
Total Zinc	0	0		0	223.797	227	309	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	4.09	
Acrylonitrile	0	0		0	130	130	177	
Benzene	0	0		0	130	130	177	
Bromoform	0	0		0	370	370	504	
Carbon Tetrachloride	0	0		0	560	560	763	
Chlorobenzene	0	0		0	240	240	327	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	4,767	
Chloroform	0	0		0	390	390	531	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	4,222	
1,1-Dichloroethylene	0	0		0	1,500	1,500	2,043	
1,2-Dichloropropane	0	0		0	2,200	2,200	2,996	
1,3-Dichloropropylene	0	0		0	61	61.0	83.1	
Ethylbenzene	0	0		0	580	580	790	
Methyl Bromide	0	0		0	110	110	150	
Methyl Chloride	0	0		0	5,500	5,500	7,491	

Methylene Chloride	0	0		0	2,400	2,400	3,269	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	286	
Tetrachloroethylene	0	0		0	140	140	191	
Toluene	0	0		0	330	330	449	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	1,907	
1,1,1-Trichloroethane	0	0		0	610	610	831	
1,1,2-Trichloroethane	0	0		0	680	680	926	
Trichloroethylene	0	0		0	450	450	613	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	150	
2,4-Dichlorophenol	0	0		0	340	340	463	
2,4-Dimethylphenol	0	0		0	130	130	177	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	21.8	
2,4-Dinitrophenol	0	0		0	130	130	177	
2-Nitrophenol	0	0		0	1,600	1,600	2,179	
4-Nitrophenol	0	0		0	470	470	640	
p-Chloro-m-Cresol	0	0		0	500	500	681	
Pentachlorophenol	0	0		0	9,015	9,01	12.3	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	124	
Acenaphthene	0	0		0	17	17.0	23.2	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	80.4	
Benzo(a)Anthracene	0	0		0	0.1	0.1	0.14	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	8,172	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	1,239	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	73.5	
Butyl Benzyl Phthalate	0	0		0	35	35.0	47.7	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	218	
1,3-Dichlorobenzene	0	0		0	69	69.0	94.0	
1,4-Dichlorobenzene	0	0		0	150	150	204	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	1,090	
Dimethyl Phthalate	0	0		0	500	500	681	
Di-n-Butyl Phthalate	0	0		0	21	21.0	28.6	
2,4-Dinitrotoluene	0	0		0	320	320	436	
2,6-Dinitrotoluene	0	0		0	200	200	272	
1,2-Diphenylhydrazine	0	0		0	3	3.0	4.09	

Fluoranthene	0	0		0	40	40.0	54.5	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	2.72	
Hexachlorocyclopentadiene	0	0		0	1	1.0	1.36	
Hexachloroethane	0	0		0	12	12.0	16.3	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	2,860	
Naphthalene	0	0		0	43	43.0	58.6	
Nitrobenzene	0	0		0	810	810	1,103	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	4,631	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	80.4	
Phenanthrene	0	0		0	1	1.0	1.36	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	35.4	
Aldrin	0	0		0	0.1	0.1	0.14	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	N/A	N/A	N/A	
Chlordane	0	0		0	0.0043	0.004	0.006	
4,4-DDT	0	0		0	0.001	0.001	0.001	
4,4-DDE	0	0		0	0.001	0.001	0.001	
4,4-DDD	0	0		0	0.001	0.001	0.001	
Dieldrin	0	0		0	0.056	0.056	0.076	
alpha-Endosulfan	0	0		0	0.056	0.056	0.076	
beta-Endosulfan	0	0		0	0.056	0.056	0.076	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	0.036	0.036	0.049	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.0038	0.004	0.005	
Heptachlor Epoxide	0	0		0	0.0038	0.004	0.005	

☒ **THH**

CCT (min): **6.988**

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	7.63	
Total Arsenic	0	0		0	10	10.0	13.6	
Total Barium	0	0		0	2,400	2,400	3,269	

Total Boron	0	0		0	3,100	3,100	4,222	
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	
Free Cyanide	0	0		0	4	4.0	5.45	
Dissolved Iron	0	0		0	300	300	409	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	1,362	
Total Mercury	0	0		0	0.050	0.05	0.068	
Total Nickel	0	0		0	610	610	831	
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	0.33	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	4.09	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	136	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	7.76	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	44.9	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	92.6	
Methyl Bromide	0	0		0	100	100.0	136	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	77.6	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	136	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	13,620	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	40.9	

2,4-Dichlorophenol	0	0		0	10	10.0	13.6	
2,4-Dimethylphenol	0	0		0	100	100.0	136	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	2.72	
2,4-Dinitrophenol	0	0		0	10	10.0	13.6	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	5,448	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	95.3	
Anthracene	0	0		0	300	300	409	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	272	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	0.14	
2-Chloronaphthalene	0	0		0	800	800	1,090	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	1,362	
1,3-Dichlorobenzene	0	0		0	7	7.0	9.53	
1,4-Dichlorobenzene	0	0		0	300	300	409	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	817	
Dimethyl Phthalate	0	0		0	2,000	2,000	2,724	
Di-n-Butyl Phthalate	0	0		0	20	20.0	27.2	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	27.2	
Fluorene	0	0		0	50	50.0	68.1	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	5.45	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	46.3	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	13.6	

n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	27.2	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.095	
Aldrin	0	0		0	N/A	N/A	N/A	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	4.2	4.2	5.72	
Chlordane	0	0		0	N/A	N/A	N/A	
4,4-DDT	0	0		0	N/A	N/A	N/A	
4,4-DDE	0	0		0	N/A	N/A	N/A	
4,4-DDD	0	0		0	N/A	N/A	N/A	
Dieldrin	0	0		0	N/A	N/A	N/A	
alpha-Endosulfan	0	0		0	20	20.0	27.2	
beta-Endosulfan	0	0		0	20	20.0	27.2	
Endosulfan Sulfate	0	0		0	20	20.0	27.2	
Endrin	0	0		0	0.03	0.03	0.041	
Endrin Aldehyde	0	0		0	1	1.0	1.36	
Heptachlor	0	0		0	N/A	N/A	N/A	
Heptachlor Epoxide	0	0		0	N/A	N/A	N/A	

☒ CRL

CCT (min): 26.663

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	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	

Total Manganese	0	0		0	N/A	N/A	N/A
Total Mercury	0	0		0	N/A	N/A	N/A
Total Nickel	0	0		0	N/A	N/A	N/A
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A
Total Selenium	0	0		0	N/A	N/A	N/A
Total Silver	0	0		0	N/A	N/A	N/A
Total Thallium	0	0		0	N/A	N/A	N/A
Total Zinc	0	0		0	N/A	N/A	N/A
Acrolein	0	0		0	N/A	N/A	N/A
Acrylonitrile	0	0		0	0.06	0.06	0.19
Benzene	0	0		0	0.58	0.58	1.87
Bromoform	0	0		0	7	7.0	22.6
Carbon Tetrachloride	0	0		0	0.4	0.4	1.29
Chlorobenzene	0	0		0	N/A	N/A	N/A
Chlorodibromomethane	0	0		0	0.8	0.8	2.58
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A
Chloroform	0	0		0	N/A	N/A	N/A
Dichlorobromomethane	0	0		0	0.95	0.95	3.07
1,2-Dichloroethane	0	0		0	9.9	9.9	31.9
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A
1,2-Dichloropropane	0	0		0	0.9	0.9	2.9
1,3-Dichloropropylene	0	0		0	0.27	0.27	0.87
Ethylbenzene	0	0		0	N/A	N/A	N/A
Methyl Bromide	0	0		0	N/A	N/A	N/A
Methyl Chloride	0	0		0	N/A	N/A	N/A
Methylene Chloride	0	0		0	20	20.0	64.5
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	0.65
Tetrachloroethylene	0	0		0	10	10.0	32.3
Toluene	0	0		0	N/A	N/A	N/A
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A
1,1,2-Trichloroethane	0	0		0	0.55	0.55	1.77
Trichloroethylene	0	0		0	0.6	0.6	1.94
Vinyl Chloride	0	0		0	0.02	0.02	0.065
2-Chlorophenol	0	0		0	N/A	N/A	N/A
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A
2-Nitrophenol	0	0		0	N/A	N/A	N/A
4-Nitrophenol	0	0		0	N/A	N/A	N/A
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A
Pentachlorophenol	0	0		0	0.030	0.03	0.097
Phenol	0	0		0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	4.84

Acenaphthene	0	0		0	N/A	N/A	N/A	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.0001	0.0001	0.0003	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.003	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.0003	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.003	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	0.032	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	0.097	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	1.03	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.12	0.12	0.39	
Dibenzo(a,h)Anthracene	0	0		0	0.0001	0.0001	0.0003	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	0.16	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	0.16	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	0.16	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	0.097	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.0003	
Hexachlorobutadiene	0	0		0	0.01	0.01	0.032	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	0.32	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.003	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.002	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.016	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	10.6	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	
Aldrin	0	0		0	0.0000008	8.00E-07	0.000003	
alpha-BHC	0	0		0	0.0004	0.0004	0.001	
beta-BHC	0	0		0	0.008	0.008	0.026	
gamma-BHC	0	0		0	N/A	N/A	N/A	

Chlordane	0	0		0	0.0003	0.0003	0.001	
4,4-DDT	0	0		0	0.00003	0.00003	0.0001	
4,4-DDE	0	0		0	0.00002	0.00002	0.00006	
4,4-DDD	0	0		0	0.0001	0.0001	0.0003	
Dieldrin	0	0		0	0.000001	0.000001	0.000003	
alpha-Endosulfan	0	0		0	N/A	N/A	N/A	
beta-Endosulfan	0	0		0	N/A	N/A	N/A	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	N/A	N/A	N/A	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.000006	0.000006	0.00002	
Heptachlor Epoxide	0	0		0	0.00003	0.00003	0.0001	

☒ **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			
Total Boron	Report	Report	Report	Report	Report	µg/L	2,179	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	1.61	2.52	24.2	37.8	60.5	µg/L	24.2	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Dissolved Iron	Report	Report	Report	Report	Report	µg/L	409	THH	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	227	AFC	Discharge Conc > 10% WQBEL (no RP)

☐ **Other Pollutants without Limits or Monitoring**

D. WETT Results

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet					
Type of Test		Chronic		Facility Name	
Species Tested		Ceriodaphnia		City of Lebanon Authority/WWTP	
Endpoint		Survival		Permit No.	
TMC (decimal)		0.73		PA0027316	
No. Per Replicate		1			
T ST b value		0.75			
T ST alpha value		0.2			

Replicate No.	Test Completion Date 10/9/2018	
	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		

Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
 Deg. of Freedom
 Critical T Value
 Pass or Fail PASS

Replicate No.	Test Completion Date 7/27/2019	
	Control	TMC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		

Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
 Deg. of Freedom
 Critical T Value
 Pass or Fail PASS

Replicate No.	Test Completion Date 10/27/2020	
	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		

Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
 Deg. of Freedom
 Critical T Value
 Pass or Fail PASS

Replicate No.	Test Completion Date 5/10/2021	
	Control	TMC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		

Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
 Deg. of Freedom
 Critical T Value
 Pass or Fail PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TWC (decimal)	0.73
No. Per Replicate	1
T ST b value	0.75
T ST alpha value	0.2

Facility Name	City of Lebanon Authority WWTP
Permit No.	PA0027316

Replicate No.	Test Completion Date 10/9/2018	
	Control	TWC
1	28	33
2	35	41
3	28	34
4	38	31
5	33	38
6	31	35
7	25	32
8	28	29
9	30	33
10	31	34
11		
12		
13		
14		
15		

Mean	30.300	33.800
Std Dev.	3.653	3.225
# Replicates	10	10

T-Test Result	8.2764
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

Replicate No.	Test Completion Date 9/24/2019	
	Control	TWC
1	24	28
2	24	28
3	24	18
4	29	27
5	23	28
6	22	28
7	20	25
8	22	24
9	20	31
10	22	30
11		
12		
13		
14		
15		

Mean	23.000	26.300
Std Dev.	2.582	3.622
# Replicates	10	10

T-Test Result	6.9673
Deg. of Freedom	15
Critical T Value	0.8662
Pass or Fail	PASS

Replicate No.	Test Completion Date 10/27/2020	
	Control	TWC
1	42	38
2	38	41
3	43	42
4	33	39
5	35	35
6	39	38
7	32	35
8	39	40
9	34	40
10	38	40
11		
12		
13		
14		
15		

Mean	38.900	38.600
Std Dev.	3.725	2.503
# Replicates	10	10

T-Test Result	9.2094
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

Replicate No.	Test Completion Date 5/11/2021	
	Control	TWC
1	43	42
2	40	43
3	32	38
4	33	43
5	21	41
6	40	39
7	45	42
8	38	37
9	41	39
10	40	43
11		
12		
13		
14		
15		

Mean	37.300	40.700
Std Dev.	6.993	2.283
# Replicates	10	10

T-Test Result	7.0447
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TWC (decimal)	0.73
No. Per Replicate	10
T ST b value	0.75
T ST alpha value	0.25

Facility Name	City of Lebanon Authority WWTP
Permit No.	PA0027316

Test Completion Date		
10/9/2018		
Replicate No.	Control	TWC
1	7	7
2	7	8
3	8	8
4	8	8
5	5	8
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean	7.000	7.800
Std Dev.	1.225	0.447
# Replicates	5	5

T-Test Result	6.7576
Deg. of Freedom	7
Critical T Value	0.7111
Pass or Fail	PASS

Test Completion Date		
9/24/2019		
Replicate No.	Control	TWC
1	10	10
2	9	9
3	10	8
4	10	9
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean	9.750	9.000
Std Dev.	0.500	0.816
# Replicates	4	4

T-Test Result	3.2547
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	PASS

Test Completion Date		
10/27/2020		
Replicate No.	Control	TWC
1	10	10
2	10	10
3	10	10
4	10	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean	10.000	10.000
Std Dev.	0.000	0.000
# Replicates	4	4

T-Test Result	
Deg. of Freedom	
Critical T Value	
Pass or Fail	PASS

Test Completion Date		
5/10/2021		
Replicate No.	Control	TWC
1	10	10
2	10	10
3	10	10
4	10	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean	10.000	10.000
Std Dev.	0.000	0.000
# Replicates	4	4

T-Test Result	
Deg. of Freedom	
Critical T Value	
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test: Chronic
 Species Tested: Pimephales
 Endpoint: Growth
 TMC (decimal): 0.73
 No. Per Replicate: 10
 T ST b value: 0.75
 T ST alpha value: 0.25

Facility Name

City of Lebanon Authority WWTP

Permit No.

PA0027318

Replicate No.	Test Completion Date 10/9/2018	
	Control	TMC
1	0.4038	0.45
2	0.4288	0.5212
3	0.4462	0.435
4	0.4887	0.4675
5	0.4275	0.4375
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean: 0.439, 0.462
 Std Dev.: 0.032, 0.035
 # Replicates: 5, 5

T-Test Result: 8.9819
 Deg. of Freedom: 7
 Critical T Value: 0.7111
 Pass or Fail: PASS

Replicate No.	Test Completion Date 9/24/2019	
	Control	TMC
1	0.434	0.409
2	0.409	0.451
3	0.449	0.445
4	0.395	0.469
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean: 0.422, 0.444
 Std Dev.: 0.024, 0.025
 # Replicates: 4, 4

T-Test Result: 8.1886
 Deg. of Freedom: 5
 Critical T Value: 0.7267
 Pass or Fail: PASS

Replicate No.	Test Completion Date 10/27/2020	
	Control	TMC
1	0.425	0.434
2	0.416	0.462
3	0.455	0.507
4	0.452	0.483
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean: 0.437, 0.472
 Std Dev.: 0.019, 0.031
 # Replicates: 4, 4

T-Test Result: 8.3850
 Deg. of Freedom: 4
 Critical T Value: 0.7407
 Pass or Fail: PASS

Replicate No.	Test Completion Date 5/10/2021	
	Control	TMC
1	0.504	0.478
2	0.41	0.471
3	0.444	0.463
4	0.444	0.433
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean: 0.451, 0.461
 Std Dev.: 0.039, 0.020
 # Replicates: 4, 4

T-Test Result: 6.9727
 Deg. of Freedom: 5
 Critical T Value: 0.7267
 Pass or Fail: PASS

E. TRC Calculations

TRC EVALUATION				
Input appropriate values in A3:A9 and D3:D9				
4.48	= Q stream (cfs)	0.5	= CV Daily	
8	= Q discharge (MGD)	0.5	= CV Hourly	
30	= no. samples	1	= AFC_Partial Mix Factor	
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor	
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)	
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)	
0	= % Factor of Safety (FOS)	0	=Decay Coefficient (K)	
Source	Reference	AFC Calculations		Reference CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.134		1.3.2.iii WLA cfc = 0.124
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.050		5.1d LTA_cfc = 0.072
Source	Effluent Limit Calculations			
PENTOXSD TRG	5.1f	AML MULT = 1.231		
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.062		AFC
		INST MAX LIMIT (mg/l) = 0.202		
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)			