

Application Type Renewal  
Facility Type Industrial  
Major / Minor Minor

**NPDES PERMIT FACT SHEET  
INDIVIDUAL INDUSTRIAL WASTE (IW)  
AND IW STORMWATER**

Application No. PA0084166  
APS ID 737  
Authorization ID 1292275

**Applicant and Facility Information**

Applicant Name	<u>Lebanon City Authority</u>	Facility Name	<u>Lebanon City Water System</u>
Applicant Address	<u>2321 Ridgeview Road</u> <u>Lebanon, PA 17042-9431</u>	Facility Address	<u>12 E Behney Street</u> <u>Lebanon, PA 17046-9318</u>
Applicant Contact	<u>Jonathan Beers</u>	Facility Contact	<u>Darren Luciotti</u>
Applicant Phone	<u>(717) 272-2842</u>	Facility Phone	<u></u>
Client ID	<u>43458</u>	Site ID	<u>262350</u>
SIC Code	<u>4941</u>	Municipality	<u>Swatara Township</u>
SIC Description	<u>Trans. &amp; Utilities - Water Supply</u>	County	<u>Lebanon</u>
Date Application Received	<u>October 15, 2019</u>	EPA Waived?	<u>Yes</u>
Date Application Accepted	<u>October 28, 2019</u>	If No, Reason	<u></u>
Purpose of Application	<u>NPDES Renewal for discharge of treated industrial wastewater</u>		

**Summary of Review**

**1.0 General Discussion**

This factsheet supports the renewal of an existing NPDES permit for a discharge of treated industrial wastewater from City of Lebanon(COLA) water treatment plant. COLA operates a 10MGD rated water treatment plant that treats raw water withdrawn from Swatara Creek and Highbridge Reservoir and supplies potable water to the city of Lebanon and six surrounding communities. The process wastewater consists of filter backwash water from the filters, solids from clarifiers, sample sink and analyzer drains, basin drains and blow-off. The process wastewater is conveyed to two onsite wastewater lagoons for detention and treatment. Supernatant from the basins is discharged to an unnamed tributary to Swatara creek, which is determined to be a dry stream at the point of discharge. Activated carbon, lime, and ferric sulfate are used prior to filters at the water treatment plant. Ammonia, fluoride and chlorine gas are used after filtration. The existing permit was based a wastewater flow of 0.568mgd and will still be used for the current renewal. The current long-term average discharge flow is below 0.568 mgd. The facility is not covered by ELG but has technology-based treatment requirements developed by the Department. See details at technology limits section of the report. Sludge is periodically pumped from the waste holding basins, dried, and hauled to land disposal sites. Storm water runoff from the plant site is also conveyed to the receiving stream. The existing permit was issued on January 28, 2015 with effective date of February 1, 2015 and expiration date of January 31, 2020. The permittee submitted a timely renewal application to the Department and has been operating under the conditions in the existing permit pending permit renewal

Topographical map showing discharge location is attached as attachment A.

Approve	Deny	Signatures	Date
X		J. Pascal Kwedza, P.E. / Environmental Engineer	October 29, 2020
X		Daniel W. Martin, P.E. / Environmental Engineer Manager	November 3, 2020
X		Maria D. Bebenek, P.E./ Program Manager	November 3, 2020

**Summary of Review**

**1.1 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.

**1.2 Existing Effluent Limits**

Discharge Parameter	Effluent Limitations					Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)			Monitoring Frequency	Required Sample Type
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Inst Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	1/day	Measured
pH (S.U.)	From 6.0 to 9 inclusive					1/week	Grab
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	1/year	24-hour comp
Total Nitrogen	XXX	XXX	XXX	Report	XXX	1/year	Calculation
TKN	XXX	XXX	XXX	Report	XXX	1/year	24-hour comp
Total Phosphorus	XXX	XXX	XXX	Report	XXX	1/year	24-hour comp
Total Suspended Solids	Report	Report	30	60	75	1/week	24-hour comp
Total Aluminum	Report	Report	0.4	0.8	1.0	1/week	24-hour comp
Dissolved Iron	Report	Report	0.21	0.62	0.78	1/week	24-hour comp
Total Iron	Report	Report	1.2	2.4	3.0	1/week	24-hour comp
Total Manganese	Report	Report	1.0	2.0	2.5	1/week	24-hour comp

**1.4 Discharge, Receiving Waters and Water Supply Information**

Outfall No.	<u>001</u>	Design Flow (MGD)	<u>0.568</u>
Latitude	<u>40° 23' 34.83"</u>	Longitude	<u>76° 27' 44.34"</u>
Quad Name	<u>Fredericksburg</u>	Quad Code	<u>1534</u>
Wastewater Description: <u>Filter backwash and blow-off</u>			
Receiving Waters	<u>Unnamed Tributary of Swatara Creek(WWF)</u>	Stream Code	<u>09882 &amp; 09880@POFU</u>
NHD Com ID	<u>56396711</u>	RMI	<u>0.3 &amp; 1.1@POFU</u>
Drainage Area	<u>0.3@POFU</u>	Yield (cfs/mi <sup>2</sup> )	<u>0.0565</u>
Q <sub>7-10</sub> Flow (cfs)	<u>0.019@POFU</u>	Q <sub>7-10</sub> Basis	<u>USGS Gage Station</u>
Elevation (ft)	<u>480@POFU</u>	Slope (ft/ft)	<u></u>
Watershed No.	<u>7-D</u>	Chapter 93 Class.	<u>WWF</u>
Existing Use	<u></u>	Existing Use Qualifier	<u></u>
Exceptions to Use	<u></u>	Exceptions to Criteria	<u></u>
Assessment Status	<u>Impaired</u>		
Cause(s) of Impairment	<u>Siltation, Flow Alterations</u>		
Source(s) of Impairment	<u>Agriculture</u>		
TMDL Status	<u>Pending</u>	Name	<u></u>
Background/Ambient Data		Data Source	
pH (SU)	<u>7</u>	Default	<u></u>
Temperature (°F)	<u>20</u>	Default	<u></u>
Hardness (mg/L)	<u>100</u>	Default	<u></u>
Other:	<u></u>		<u></u>
Nearest Downstream Public Water Supply Intake	<u>PA American Water</u>		
PWS Waters	<u>Swatara Creek</u>	Flow at Intake (cfs)	<u></u>
PWS RMI	<u></u>	Distance from Outfall (mi)	<u>24</u>

Changes Since Last Permit Issuance:

Other Comments:

**1.4.1 Water Supply Intake**

The closest water supply intake located downstream from the discharge is the PA American Water Company on Swatara Creek at Sand Beach in South Hanover Township, Dauphin County. The distance downstream from the discharge to the intake is approximately 24 miles. The discharge has no impact on the intake.

1.5 Treatment Facility Summary				
Treatment Facility Name: Lebanon City Water				
WQM Permit No.		Issuance Date		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Industrial	Primary	Sedimentation		
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
			Concentration	Drying Beds

Changes Since Last Permit Issuance:

Other Comments:

**1.5.1 Treatment System**

The treatment plant consists of two lagoons for detention and sedimentation prior to discharge.

**2.0 Compliance History**

**2.1 DMR Data for Outfall 001 (from September 1, 2019 to August 31, 2020)**

Parameter	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19	OCT-19	SEP-19
Flow (MGD) Average Monthly	0.5873	0.4626	0.6419	0.7018	0.5631	0.5304	0.360	0.3271	0.2779	0.3366	0.3454	0.3168
Flow (MGD) Daily Maximum	1.329	0.7338	1.9312	1.5971	0.7948	0.7943	0.433	0.4916	0.5086	1.0315	0.7093	0.6125
pH (S.U.) Minimum	7.3	7.2	7.24	7.29	7.31	7.09	7.01	7.22	7.2	7.33	7.41	7.53
pH (S.U.) Maximum	8.7	7.85	7.77	7.74	7.79	7.82	7.72	7.69	7.71	7.92	7.83	7.91
TSS (lbs/day) Average Monthly	< 22	< 25	< 29	< 25	< 24	< 24	< 14	< 16	< 12	< 14	< 11	< 12
TSS (lbs/day) Daily Maximum	< 28	30	< 63	44	< 26	< 26	< 17	< 20	< 13	< 24	< 16	< 22
TSS (mg/L) Average Monthly	< 5	< 6	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TSS (mg/L) Daily Maximum	< 5	8	< 5	6	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Nitrate-Nitrite (mg/L) Annual Average									0.32			
Total Nitrogen (mg/L) Annual Average									1.42			
TKN (mg/L) Annual Average									1.1			
Total Phosphorus (mg/L) Annual Average									< 0.10			
Total Aluminum (lbs/day) Average Monthly	< 0.2	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.1	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1
Total Aluminum (lbs/day) Daily Maximum	0.3	0.4	< 0.6	< 0.4	< 0.3	< 0.3	< 0.2	< 0.2	0.2	< 0.2	< 0.2	< 0.2
Total Aluminum (mg/L) Average Monthly	< 0.054	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.058	< 0.05	< 0.05	< 0.05
Total Aluminum (mg/L) Daily Maximum	0.065	0.11	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.088	< 0.05	< 0.05	< 0.05

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Dissolved Iron (lbs/day) Average Monthly	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1	< 0.2
Dissolved Iron (lbs/day) Daily Maximum	< 0.3	< 0.3	< 0.8	< 0.4	< 0.3	< 0.3	< 0.2	< 0.2	0.5	< 0.3	< 0.2	< 0.3
Dissolved Iron (mg/L) Average Monthly	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.08	< 0.06	0.06
Dissolved Iron (mg/L) Daily Maximum	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.18	< 0.06	< 0.06
Total Iron (lbs/day) Average Monthly	1	3	3	4	3	3	2	2	2	2	0.9	1
Total Iron (lbs/day) Daily Maximum	2	4	7	5	4	4	3	3	4	3	2	2
Total Iron (mg/L) Average Monthly	0.32	0.6	0.62	0.78	0.54	0.70	0.78	0.76	0.91	0.66	0.353	0.6
Total Iron (mg/L) Daily Maximum	0.47	1.1	0.91	1.0	0.83	0.80	0.92	0.82	1.4	0.76	0.49	1.2
Total Manganese (lbs/day) Average Monthly	0.07	0.1	0.2	0.3	0.3	0.2	0.1	0.07	0.05	0.06	0.02	0.03
Total Manganese (lbs/day) Daily Maximum	0.1	0.2	0.5	0.5	0.8	0.2	0.3	0.1	0.06	0.1	0.04	0.05
Total Manganese (mg/L) Average Monthly	0.016	0.022	0.026	0.053	0.07	0.04	0.042	0.021	0.02	0.021	0.009	0.0123
Total Manganese (mg/L) Daily Maximum	0.021	0.044	0.043	0.077	0.15	0.053	0.086	0.028	0.024	0.023	0.013	0.021

**2.2 Summary of DMRs:**

Discharge Monitoring Reports (DMRs) review for the facility for the last 12 months of operation presented on the table above indicate permit limits have been met consistently. No permit violation noted on DMRs during the period reviewed.

**2.3 Summary of Inspections:**

The facility was inspected a couple of times during the past permit cycle. Inspection reports review for the facility during the period indicate permit limits have been met consistently. The reports indicate good operation and maintenance of the treatment system. The facility has good compliance record.

**3.0 Development of Effluent Limitations**

Outfall No. 001 Design Flow (MGD) 0.568  
 Latitude 40° 23' 34.83" Longitude 76° 27' 44.34"  
 Wastewater Description: Filter backwash and blow-off

**3.1 Basis for Effluent Limitations**

In general, the Clean Water Act(AWA) 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(WQBEL) 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.

**3.2 Technology-Based Limitations**

Technology-based (BAT) effluent limits for water treatment plant wastewater discharges are presented in the Department's June 1989 Guidance document entitled, "Technology Based Controls for Discharges from Water Treatment Plants" as follows:

Parameter	Monthly Avg mg/l	Daily Max. mg/l
Suspended Solids	30	60
Aluminum	4	8
Iron	2	4
TRC*	0.5	1
Manganese	1	2
pH	6 - 9 S.U at all times	

\*See TRC section of the report for details

**3.3 Water Quality-Based Limitations**

**3.3.1 Streamflow**

Streamflow will be correlated with past streamflow records taken from the nearby USGS gage station No. 01573000 on Swatara Creek. The drainage area at the gage is 299 sq. mi(see attached print-out) The resulting stream flows are as follow:

$$Q_{7-10} = 19.6 \text{ cfs} / 299 \text{ sq. mi} = 0.0656\text{cfs/sq.mi}$$

$$Q_{30-10} / Q_{7-10} = 1.4$$

$$Q_{1-10} / Q_{7-10} = 0.81$$

The area at the point of first use is 0.3sq. mi. The design flow is calculated as:

$$Q_{7-10} = 0.0656\text{cfs} \times 0.3 \text{ sq. mi} = 0.019\text{cfs}$$

**3.3.2 The following input data were used for PENTOXSD model:**

- Discharge pH = 7.3 (DMR median July – Sept.)
- Discharge Temperature = 25 ° C (Default)
- Stream pH = 7.0 (Default)
- Stream Temperature = 20 ° C (Default)
- Discharge Hardness = 83 mg/l
- Stream Hardness = 100 mg/l

### **3.3.3 Toxics**

A reasonable potential (RP) was done for pollutant Groups 1 and 2 submitted with the application. All pollutants that were presented in the application sampling data and all pollutants in the existing permit were entered into the Toxics Management Spreadsheet (TMS) which combines the existing Toxics Screening Analysis Spreadsheet and PENTOXSD Model to calculate WQBELs. WQBELs recommended by the TMS are presented in attachment B. The results of the TMS indicate discharge levels are well below DEP's target quantitation limits and the calculated WQBELs, therefore, no monitoring or limitation was recommended. However, due to anti-backsliding restrictions, the existing water quality-based limits for Total Iron, dissolved Iron and Total Aluminum and the existing technology limit on Total Manganese will remain the permit. Mass loads will be written for water-quality base limits and reported for technology-based limits following permit writer's manual No. 362-0400-001 Table 5-2, 10/1/97 Edition. There are no water quality criteria for Total Suspended Solids, the existing technology limit will remain in the permit.

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.

### **3.3.4 Total Residual Chlorine**

The attached TRC result presented in attachment C utilizes the equations and calculations as presented in the Department's 2003 Implementation Guidance for Residual Chlorine (TRC) (ID # 391-2000-015) for developing chlorine limitations. The attached result indicates that an average monthly water quality limit of 0.012 mg/l would be needed to prevent toxicity concerns at the POFU. This TRC limit is below the normal detection level (0.02 mg/l). The application listed non detect for all 3 samples of TRC sampled at outfall 001. Considering the volatilization that is expected to occur during flow in the dry channel, any TRC levels that maybe present in the effluent will be reduced to below detection limits before reaching the POFU. No TRC limit will be required for this permit cycle.

### **3.3.5 TDS, Sulfate, Chloride, Bromide & 1,4-Dioxane**

Under the authority of §92a.61, DEP has determined it should implement increased monitoring in NPDES permits for TDS, sulfate, chloride, bromide, and 1,4-dioxane. The following approach will be implemented for point source discharges upon issuance or reissuance of an individual NPDES permit:

- Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.
- Where the concentration of bromide in a discharge exceeds 1 mg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for bromide. Discharges of 0.1 MGD or less should monitor and report for bromide if the concentration of bromide in the discharge exceeds 10 mg/L.
- Where the concentration of 1,4-dioxane (CAS 123-91-1) in a discharge exceeds 10 µg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for 1,4-dioxane. Discharges of 0.1 MGD or less should monitor and report for 1,4-dioxane if the concentration of 1,4-dioxane in the discharge exceeds 100 µg/L.

The maximum daily TDS discharge reported in the application is 138 mg/l. The discharge level for TDS is below 1000mg/l, therefore no monitoring for TDS, Chloride Bromide and Sulfite is required. There is no data for 1,4-dioxane, no monitoring is required at this time.

### **3.3.6 Chesapeake Bay Strategy:**

In 2003, EPA established state-wide cap loads for Total Nitrogen and Total Phosphorus for Pennsylvania that are needed to ensure compliance with new water quality standards enacted to restore the water quality of the Chesapeake Bay. DEP released Pennsylvania's Chesapeake Bay Tributary Strategy (CBTS) in January of 2005 to guide Pennsylvania's efforts to meet those cap loads and revised the Strategy in 2006-2007 following a stakeholder process. Industrial discharges have been prioritized by Central Office based on their delivered TN and TP loadings to the Bay. Significant industrial wastewater dischargers are facilities that discharge more than 75 lbs/day of TN or 25 lbs/day of TP on an average annual basis and the



rest are classified as non-significant dischargers. DEP developed Chesapeake Bay IW monitoring plan for all industrial facilities that discharge to the Chesapeake Bay. This facility is classified as a non-significant discharger with little or no potential to introduce nutrients to the receiving stream but has been monitoring TP and the TN series (nitrate-nitrite, TKN) and will continue monitoring them annually to collect data for Chesapeake Bay modelling in future.

#### **4.0 Other Requirements**

##### **4.1 Anti-backsliding**

Not applicable to this permit

##### **4.3 Cleaning of Sedimentation Tanks**

The lagoons are cleaned periodically, and the solids removed. Conditions and reporting requirements prior and during lagoons cleaning can be found in PART C of the permit.

##### **4.4 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.

##### **4.5 Class A Wild Trout Fisheries**

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

##### **4.6 303d Listed Streams**

The discharge is located on a 303d listed stream segment as impaired for siltation and flow alterations due to agricultural activities. TMDL is pending, since this facility is not contributing to the impairment, no further action is warranted at this time.

##### **4.7 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).

##### **4.8 Effluent Monitoring**

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.

**5.0 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.**

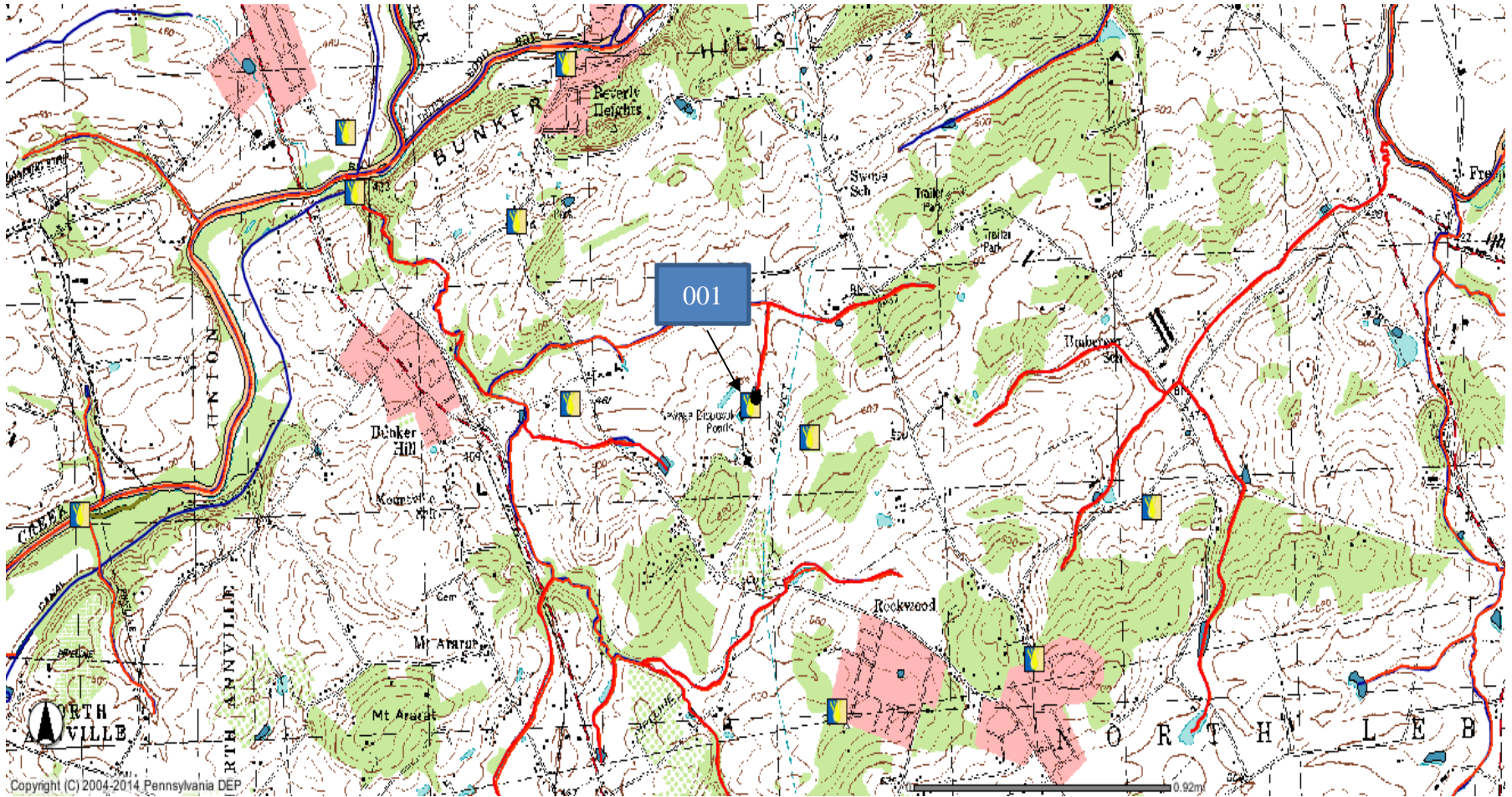
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) <sup>(1)</sup>		Concentrations (mg/L)				Minimum <sup>(2)</sup> Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
TSS	Report	Report	XXX	30	60	75	1/week	24-Hr Composite
Nitrate-Nitrite	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
TKN	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Aluminum	1.90	3.79	XXX	0.4	0.8	1	1/week	24-Hr Composite
Dissolved Iron	1.47	2.94	XXX	0.31	0.62	0.78	1/week	24-Hr Composite
Total Iron	5.69	11.38	XXX	1.2	2.4	3	1/week	24-Hr Composite
Total Manganese	Report	Report	XXX	1.0	2.0	2.5	1/week	24-Hr Composite

Compliance Sampling Location: At Outfall 001

6.0 Tools and References Used to Develop Permit	
<input type="checkbox"/>	WQM for Windows Model (see Attachment <span style="background-color: yellow;">      </span> )
<input checked="" type="checkbox"/>	PENTOXSD for Windows Model (see Attachment <b>C</b> )
<input checked="" type="checkbox"/>	TRC Model Spreadsheet (see Attachment <b>D</b> )
<input type="checkbox"/>	Temperature Model Spreadsheet (see Attachment <span style="background-color: yellow;">      </span> )
<input checked="" type="checkbox"/>	Toxics Screening Analysis Spreadsheet (see Attachment <b>B</b> )
<input type="checkbox"/>	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
<input type="checkbox"/>	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
<input type="checkbox"/>	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
<input type="checkbox"/>	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
<input checked="" type="checkbox"/>	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
<input type="checkbox"/>	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
<input type="checkbox"/>	Pennsylvania CSO Policy, 385-2000-011, 9/08.
<input type="checkbox"/>	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
<input type="checkbox"/>	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
<input checked="" type="checkbox"/>	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
<input type="checkbox"/>	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
<input type="checkbox"/>	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
<input type="checkbox"/>	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
<input type="checkbox"/>	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
<input type="checkbox"/>	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
<input type="checkbox"/>	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
<input type="checkbox"/>	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
<input type="checkbox"/>	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Design Stream Flows, 391-2000-023, 9/98.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
<input checked="" type="checkbox"/>	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
<input checked="" type="checkbox"/>	SOP: Establishing effluent limitation for individual industrial permit
<input type="checkbox"/>	Other: <span style="background-color: yellow;">      </span>

## 7. Attachments

### A. Topographical Map



B. Toxic Management Spreadsheet



Toxics Management Spreadsheet  
Version 1.1, October 2020

Model Results

City of Lebanon Water Pant, NPDES Permit No. PA0084166, Outfall 001

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

Hydrodynamics

Q<sub>7-10</sub>

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
1.1	0.02		0.02	0.879	0.011	0.529	6.141	11.604	0.276	0.222	0.00045
0.1	0.02		0.018								

Q<sub>n</sub>

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
1.1	0.21		0.21	0.879	0.011	0.577	6.141	10.647	0.307	0.199	0.041
0.1	0.226		0.23								

Wasteload Allocations

AFC 
 CCT (min):  
 PMF:  
 Analysis Hardness (mg/l):  
 Analysis pH:

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	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	764	
Total Antimony	0	0		0	1,100	1,100	1,121	
Total Arsenic	0	0		0	340	340	347	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	21,405	
Total Boron	0	0		0	8,100	8,100	8,256	
Total Cadmium	0	0		0	1.686	1.77	1.81	Chem Translator of 0.952 applied
Hexavalent Chromium	0	0		0	16	16.3	16.6	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	96.8	
Total Copper	0	0		0	11.316	11.8	12.0	Chem Translator of 0.96 applied
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	52.916	64.7	66.0	Chem Translator of 0.818 applied
Total Manganese	0	0	0	N/A	N/A	N/A	
Total Mercury	0	0	0	1.400	1.65	1.68	Chem Translator of 0.85 applied
Total Nickel	0	0	0	401.260	402	410	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	2.350	2.77	2.82	Chem Translator of 0.85 applied
Total Thallium	0	0	0	65	65.0	66.3	
Total Zinc	0	0	0	100.395	103	105	Chem Translator of 0.978 applied

CFC

CCT (min):

PMF:

Analysis Hardness (mg/l):

Analysis pH:

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	
Fluoride (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	224	
Total Arsenic	0	0		0	150	150	153	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	4,179	
Total Boron	0	0		0	1,600	1,600	1,631	
Total Cadmium	0	0		0	0.217	0.24	0.24	Chem Translator of 0.917 applied
Hexavalent Chromium	0	0		0	10	10.4	10.6	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	19.4	
Total Copper	0	0		0	7.663	7.98	8.14	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	1,529	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.062	2.52	2.57	Chem Translator of 0.818 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	0.92	Chem Translator of 0.85 applied
Total Nickel	0	0		0	44.568	44.7	45.6	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	5.09	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	13.3	
Total Zinc	0	0		0	101.217	103	105	Chem Translator of 0.986 applied

THH

CCT (min):

PMF:

Analysis Hardness (mg/l):

Analysis pH:

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	
Fluoride (PWS)	0	0		0	2,000	2,000	N/A	

Total Aluminum	0	0	0	N/A	N/A	N/A
Total Antimony	0	0	0	5.6	5.6	5.71
Total Arsenic	0	0	0	10	10.0	10.2
Total Barium	0	0	0	2,400	2,400	2,446
Total Boron	0	0	0	3,100	3,100	3,160
Total Cadmium	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
Dissolved Iron	0	0	0	300	300	306
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	1,019
Total Mercury	0	0	0	0.050	0.05	0.051
Total Nickel	0	0	0	610	610	622
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	0.24
Total Zinc	0	0	0	N/A	N/A	N/A

CRL      CCT (min):       PMF:       Analysis Hardness (mg/l):       Analysis pH:

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	0	N/A	N/A	N/A	
Chloride (PWS)	0	0	0	0	N/A	N/A	N/A	
Sulfate (PWS)	0	0	0	0	N/A	N/A	N/A	
Fluoride (PWS)	0	0	0	0	N/A	N/A	N/A	
Total Aluminum	0	0	0	0	N/A	N/A	N/A	
Total Antimony	0	0	0	0	N/A	N/A	N/A	
Total Arsenic	0	0	0	0	N/A	N/A	N/A	
Total Barium	0	0	0	0	N/A	N/A	N/A	
Total Boron	0	0	0	0	N/A	N/A	N/A	
Total Cadmium	0	0	0	0	N/A	N/A	N/A	
Hexavalent Chromium	0	0	0	0	N/A	N/A	N/A	
Total Cobalt	0	0	0	0	N/A	N/A	N/A	
Total Copper	0	0	0	0	N/A	N/A	N/A	
Dissolved Iron	0	0	0	0	N/A	N/A	N/A	
Total Iron	0	0	0	0	N/A	N/A	N/A	
Total Lead	0	0	0	0	N/A	N/A	N/A	
Total Manganese	0	0	0	0	N/A	N/A	N/A	
Total Mercury	0	0	0	0	N/A	N/A	N/A	
Total Nickel	0	0	0	0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0	0	0	N/A	N/A	N/A	
Total Selenium	0	0	0	0	N/A	N/A	N/A	
Total Silver	0	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**

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

Other Pollutants without Limits or Monitoring

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Fluoride (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	750	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	2,446	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	1,631	µg/L	Discharge Conc < TQL
Total Cadmium	0.24	µg/L	Discharge Conc < TQL
Hexavalent Chromium	10.6	µg/L	Discharge Conc < TQL
Total Cobalt	19.4	µg/L	Discharge Conc < TQL
Total Copper	8.14	µg/L	Discharge Conc < TQL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	306	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	1,529	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	2.57	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	1,019	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.051	µg/L	Discharge Conc ≤ 10% WQBEL
Total Nickel	45.6	µg/L	Discharge Conc < TQL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	5.09	µg/L	Discharge Conc < TQL
Total Silver	2.77	µg/L	Discharge Conc < TQL
Total Thallium	0.24	µg/L	Discharge Conc < TQL
Total Zinc	103	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS



C. TRC Calculations

1A	B	C	D	E	F	G
2	<b>TRC EVALUATION</b>		<b>Enter Facility Name in E3</b>			
3	Input appropriate values in B4:B8 and E4:E7					
4	0.02	= Q stream (cfs)		0.5	= CV Daily	
5	0.568	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
		= % Factor of Safety (FOS)			=Decay Coefficient (K)	
#	Source	Reference	AFC Calculations		Reference	CFC Calculations
#	TRC	1.3.2.iii	WLA_afc = 0.026		1.3.2.iii	WLA_cfc = 0.018
#	PENTOXSD TRG	5.1a	LTAMULT_afc = 0.373		5.1c	LTAMULT_cfc = 0.581
#	PENTOXSD TRG	5.1b	LTA_afc = 0.010		5.1d	LTA_cfc = 0.011
#	Source	Effluent Limit Calculations				
#	PENTOXSD TRG	5.1f	AML_MULT = 1.231			
#	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.012		AFC	
#			INST MAX LIMIT (mg/l) = 0.039			
	WLA_afc	$(.019/e^{-k \cdot AFC\_tc}) + [(AFC\_Yc \cdot Qs \cdot .019 / Qd \cdot e^{-k \cdot AFC\_tc}) \dots + Xd + (AFC\_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$				
	LTAMULT_afc	$EXP((0.5 \cdot LN(cvh^2 + 1)) - 2.326 \cdot LN(cvh^2 + 1)^{0.5})$				
	LTA_afc	wla_afc * LTAMULT_afc				
	WLA_cfc	$(.011/e^{-k \cdot CFC\_tc}) + [(CFC\_Yc \cdot Qs \cdot .011 / Qd \cdot e^{-k \cdot CFC\_tc}) \dots + Xd + (CFC\_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$				
	LTAMULT_cfc	$EXP((0.5 \cdot LN(cvd^2 / no\_samples + 1)) - 2.326 \cdot LN(cvd^2 / no\_samples + 1)^{0.5})$				
	LTA_cfc	wla_cfc * LTAMULT_cfc				
	AML_MULT	$EXP(2.326 \cdot LN((cvd^2 / no\_samples + 1)^{0.5}) - 0.5 \cdot LN(cvd^2 / no\_samples + 1))$				
	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)				