pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

SOUTHCENTRAL REGIONAL OFFICE
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0083941**
Facility Type	**Industrial**	APS ID	**278373**
Major / Minor	**Minor**	Authorization ID	**1279790**

NPDES PERMIT FACT SHEET ADDENDUM

Applicant and Facility Information

Applicant Name	**Community Refuse Service LLC**	Facility Name	**Cumberland County Landfill**
Applicant Address	620 Newville Road	Facility Address	620 Newville Road
	Newburg, PA 17240		Newburg, PA 17240
Applicant Contact	Jarod Freese	Facility Contact	Jarod Freese
Applicant Phone	(717) 729-1270	Facility Phone	(717) 729-1270
Client ID	77240	Site ID	254520
SIC Code	4953	Municipality	Hopewell Township
SIC Description	Trans. & Utilities - Refuse Systems	County	Cumberland
Date Published in PA Bulletin	November 14, 2020	EPA Waived?	Yes
Comment Period End Date	December 14, 2020	If No, Reason	
Purpose of Application	NPDES Renewal.		

Internal Review and Recommendations

A draft permit was prepared on October 28, 2020 and published in the *Pennsylvania Bulletin* on November 14, 2020 for public comments for 30 days. During the 30-day public comment period, no draft permit comments were received from the public. On December 11, 2020, the permittee provided a letter with draft permit comments (see attached). DEP addressed these draft permit comments via email dated December 15, 2020. A meeting was held on December 22, 2020 to discuss draft permit comments as well as other items pertaining to operation and maintenance. During the meeting, DEP agreed that a further assessment on the discharge volume by the permittee is needed to determine the proper design flow to be used in developing permit requirements and to determine if the WQM permit amendment is needed. Further details are explained below.

Given the fact that the draft permit was last issued in 2020 and major modifications made to the original draft permit that are mentioned in this fact sheet addendum, it is recommended that the draft permit be revised and republished in the *Pennsylvania Bulletin* for another 30 days for public comments.

As the date of this fact sheet addendum, there is no open violation associate with the permittee or facility.

Approve	Return	Deny	Signatures	Date
X			*Jinsu Kim* Jinsu Kim / Environmental Engineering Specialist	September 15, 2021
X			*Maria D. Bebenek for Daniel W. Martin* Daniel W. Martin, P.E. / Environmental Engineer Manager	September 16, 2021
X			*Maria D. Bebenek* Maria D. Bebenek, P.E. / Program Manager	September 16, 2021

Internal Review and Recommendations

Design Flow

Based on a conference call dated September 2, 2021 as well as the email from the permittee dated August 31, 2021, additional flows of 10,000 to 15,000 GPD is expected from new gas wells. According to the permittee, these flows would also be considered "leachate" generated within the site. The current flow data provided by the permittee on the August 31, 2021 email is shown below.

2021 Leachate Disposal Summary (Cumberland Landfill)						
Month	Year	Days/ Month	Outfall (1)	Total Trucked (2)	Total Leachate Volume	Average Month
			Gallons	Gallons	Gallons	gpd
August, 2020	2020	31	3,102,418	0	3,102,418	100,078
September, 2020	2020	30	3,058,050	0	3,058,050	101,935
October, 2020	2020	31	3,210,546	0	3,210,546	103,566
November, 2020	2020	30	1,990,890	177,000	2,167,890	72,263
December, 2020	2020	31	1,298,962	4,194,279	5,493,241	177,201
January, 2021	2021	31	1,021,297	4,153,928	5,175,225	166,943
February, 2021	2021	28	731,053	409,935	1,140,988	40,750
March, 2021	2021	31	781,073	1,827,548	2,608,621	84,149
April, 2021	2021	30	2,022,670	2,049,053	4,071,723	135,724
May, 2021	2021	31	872,714	1,788,000	2,660,714	85,829
June, 2021	2021	30	607,020	1,638,000	2,245,020	74,834
July, 2021	2021	31	260,869	1,926,000	2,186,869	70,544
August, 2021	2021	31	313,527	3,184,000	3,497,527	112,823
(1) Outfall Recordings					Annual Average (gpd)	102,049
(2) Liquids hauled to POTWs						

With these additional flows, DEP and the permittee agreed that the average flow could be about 110,000 GPD to 125,000 GPD. During the September 2, 2021 call, the permittee indicated that these additional flows expected to occur within this year.

For the worst-case scenario, 125,000 GPD is selected to be the design flow to be used in developing NPDES permit requirements. As the draft permit was developed based on 100,000 GPD, DEP has decided to revisit all permit requirements.

1. Flow Monitoring
   The requirement to monitor the volume of effluent should be included in the permit per 40 CFR § 122.44(i)(1)(ii) regardless of the design flow value.

2. pH
   pH effluent limits should be included in the permit per both federal and state effluent standards regardless of the design flow value.

3. Dissolved Oxygen, CBOD5, Ammonia-Nitrogen (NH3-N)
   WQM 7.0 ver. 1.1 has been reutilized using 0.125 MGD. The model output shows all existing limits are still protective of water quality under a new design flow.

4. Total Suspended Solids (TSS)
   TSS effluent limits were developed on a case-by-case basis using BPJ, not based on the design flow. Thus, no changes will be made to the existing limits.

5. Fecal Coliform
   Fecal Coliform effluent limits were developed based on the state effluent standards. Thus, no changes will be made to the existing limits.

6. Toxics
   Except for N-Nitrosodimethylamine, all effluent limits for toxics pollutants are still appropriate; they are based on the federal effluent standards and no WQBELs are still recommended. For N-Nitrosodimethylamine, more stringent

Internal Review and Recommendations

effluent limits are recommended (0.31 ug/L v. 0.377 ug/L for average monthly; 0.48 ug/L v. 0.588 ug/L for daily maximum). These WQBELs are much lower than the current DEP's Target Quantitation Limit of 5 ug/L. In such cases, DEP typically asks, under the standard Part C condition, permittees to analyze the parameter using methods that will achieve the QL and to report the value less than the QL to be in compliance. The permittee reported 1.4 ug/L for this parameter. As the permittee is able to meet the QL, the proposed TRE condition in Part C will be removed from the permit.

7. Mass Load Effluent Limits
   All mass load effluent limits were calculated based on a formula: design flow x concentration limits x conversion factor of 8.34. Since the design flow has been modified from 0.1 MGD to 0.125 MGD. All mass load effluent limits have been recalculated to reflect this change.

8. Monitoring-Only Requirements
   The monitoring-only requirements for those pollutants listed in the permit will remain unchanged in the permit.

9. WQM Permit Amendment
   The current WQM permit no. 2173201 specifies an annual average design flow of 0.1 MGD with a hydraulic design capacity of 0.15 MGD. As long as the flow does not exceed the existing hydraulic design capacity, DEP determined that it may not be reasonable to amend the WQM permit to adjust the annual average design flow at this time since it is still unclear as to whether this modified flow (0.125 MGD) can actually be considered an annual average design flow.

Total Arsenic and Total Barium

Presumably, the existing effluent limits for Total Arsenic and Total Barium were developed based on DEP's technical guidance no. 362-2183-001 (issued on June 1, 1996). This guidance lists BAT TBELs for a number of toxic pollutants as they were previously determined to be parameters of concern for development of initial NPDES permit for new municipal waste landfill. US. EPA's technical guidance no. EPA-821-R-99-019 indicates that barium was detected less than 5 times the method detection limit; thus EPA excluded Barium (along with Chromium) from regulation as EPA determined that Barium is not likely to cause toxic effects. Arsenic is included in the federal ELGs for hazardous waste landfill but was excluded from the federal ELGs for non-hazardous waste landfill such as municipal waste landfill. EPA's guidance indicates that the agency did not find toxic metals such as arsenic at treatable levels in any of EPA's sampling episodes for municipal landfills.

Based on these findings, DEP has decided to revisit existing permit requirements for Total Arsenic and Total Barium. Those BAT limits established in the guidance were primarily designed for new facilities (post 1980) that do not have any historical data to properly characterize effluent water quality. When the guidance was developed, US EPA has not yet developed BAT ELGs for landfill point source discharges. In January 2000, US EPA promulgated the ELGs that include BAT standards for both non-hazardous and hazardous waste landfills. The BAT ELGs do not include effluent limitations for both Arsenic and Barium. It may not be acceptable to apply these old BAT limits listed in DEP's technical guidance to the permit unless there is any reason(s) to believe that certain pollutants on that list are discharged at levels high enough to cause adverse environmental impacts. The permittee provided a number of sampling datasets for both Barium and Arsenic. The maximum concentrations for Barium and Arsenic for untreated leachate were 0.78 mg/L and 0.59 mg/L, respectively. The permittee also collected samples of treated leachate (clarifier effluent) after implementing different types of metal removal treatments. The maximum concentrations reported during these trials were 0.46 mg/L for Barium and 0.1 mg/L for Arsenic. DEP's TMS was utilized using untreated leachate concentrations and showed that WQBELs are required for Arsenic but no reasonable potential has been demonstrated for Barium. When using maximum concentrations for treated leachate, a monitoring-only requirement is recommended for Arsenic and no permit requirement is recommended for Barium.

Based on this, it is recommended that existing effluent limits for Total Barium be removed as the reasonable potential analyses under both untreated leachate and treated leachate do not recommend any permit requirements for Total Barium. This decision is supported by 40 CFR 122.44(i)(B)(1).

For Arsenic, it is not reasonable to impose WQBELs that were developed based on the untreated leachate. It is recommended that existing effluent limits for Total Arsenic be replaced with a routine monitoring requirement. A further reasonable potential analysis will be conducted once the facility starts to collect actual effluent data. Ample datasets will be available for the subsequent permit renewal for a further analysis.

This revised draft permit will include the latest standard conditions in Part A and B of the permit. All other permit requirements will remain the same as those specified in the October 28, 2020 draft permit.

Attachments

1. Draft Permit Comment Letter (via email dated December 11, 2020)

Kim, Jin Su

From: Freese, Jarod <jfreese@wm.com>
Sent: Friday, December 11, 2020 9:27 AM
To: Kim, Jin Su
Cc: McIntyre, Michael; Landman, Harold; Benham, Michael; Maurer, Aaron
Subject: [External] Cumberland County Landfill (PA0083941) DRAFT NPDES Permit Comments
Attachments: CCLF.DRAFT NPDES Permit Comment Letter.pdf

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Mr. Kim,

Attached is the Community Refuse Service, LLC comments for the DRAFT NPDES permit for the Cumberland County Landfill, permit # PA0083941. If you should have any questions, please feel free to contact me at your earliest convenience.

Regards,

Jarod Freese
Environmental Protection Manager
jfreese@wm.com

Waste Management
1000 New Ford Mill Road
Morrisville, PA 19067
Tel (215) 428-4391
Cell (215) 783-2216

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WASTE MANAGEMENT OF PA
1000 New Ford Mill Road
Morrisville, PA 19067
(215) 428–4340
(215) 428–4345 Fax

December 11, 2020

Commonwealth of Pennsylvania
Department of Environmental Protection
Southcentral Regional Office
909 Elmerton Avenue
Harrisburg, Pennsylvania 17110-8200

Attention: Mr. Jinsu Kim
Environmental Engineering Specialist, Clean Water Program

RE: DRAFT NPDES Permit – Industrial Waste
Cumberland County Landfill
Application No. PA0083941
Authorization ID No. 1279790
Hopewell Township, Cumberland County

Dear Mr. Kim:

Community Refuse Service, LLC ("CRS") has reviewed the October 28, 2020 NPDES DRAFT Permit (No. PA0083941) for Cumberland County Landfill and are providing the following comments:

1. Part A – Mass and concentration limits for N-nitrosodimethylamine are proposed for Outfall 001, compared to monitor and report only for outfalls 002 through 018. If this is a WQBEL requirement for the receiving stream, can this limit be revised to monitor/report only initially to asses if this is present in the site discharge?

2. Part A – Outfalls #017 and #018 are listed in the NPDES permit with monitoring requirements however they have not been built/established at this time. Currently the basins associated with those outfalls have yet to be constructed. Waste Management will notify the Department upon the completion of basin construction to initiate sampling requirements.

3. The mass/concentration limits for N-nitrosodimethylamine in the draft permit are based on a discharge flow of 100,000 gpd while all other parameter limits in the current and draft permit were based on a discharge flow of 150,000 gpd. Should the N-nitrosodimethylamine limits also be based on 150,000 gpd like all other parameters?

4. Part C – Other Requirements, Section II & III – N-nitrosodimethylamine has been added as a parameter to sample in the issued draft permit to all identified outfalls. It is not part of the current permit and is less likely to be found in landfill leachate based on literature and data available. CRS would like some background on this new permit requirement and why it has been added.

5. Part C – Other Requirements, Section II & III – Water Quality-Based Effluent Limitations for Toxic Pollutants associated with Outfall 001. Appears that a Toxic Reduction Evaluation (TRE) is required for Outfall 001 with a TRE Work Plan to be submitted six (6) months following the Permit effective date, completion of the TRE and site-specific data collection 18-months following the Permit effective date, and submission of the finalized WQBEL compliance report 24 months following the Permit effective date. Waste Management would like some background on this new permit requirement and why it has been added.

6. Part C – The actions listed in the DRAFT Permit leaves the site with 12 months to implement contaminant reduction technologies at the leachate treatment plant to achieve compliance. The schedule appears to provide limited time for monitoring and assessing plant performance prior to developing a TRE work plan in the first 6 months. The overall schedule of actions appears tight from an evaluation and implementation standpoint. CRS would like to discuss schedule flexibility regarding the completion, evaluation, and implementation if required.

Should you have any questions regarding these reports, please feel free to contact the undersigned at 215-428-4391.

Sincerely,

Jarod Freese

Jarod Freese
Environmental Protection Manager
Waste Management - Greater Mid-Atlantic Area

2. DEP Response Email dated December 15, 2020

Kim, Jin Su

From:	Kim, Jin Su
Sent:	Tuesday, December 15, 2020 11:16 AM
To:	Freese, Jarod
Cc:	McIntyre, Michael; Landman, Harold; Benham, Michael; Maurer, Aaron; Martin, Daniel
Subject:	RE: [External] RE: Cumberland County Landfill (PA0083941) DRAFT NPDES Permit Comments

Hello Jarod,

This is in response to your comments dated December 11, 2020 on the draft NPDES permit issued on October 28, 2020.

1. Response to Comment nos. 1, 4, 5, 6 regarding a new effluent limit for n-nitrosodimethylamine:
The draft permit contains effluent limits for n-nitrosodimethylamine. These effluent limits are WQBELs based on the concentrations reported in the application and the water quality analysis conducted during the draft permit review. As this pollutant is presented in the effluent at a level higher than the WQBEL, the Department determined that this pollutant using a TRE analysis be investigated and possibly eliminated. The required TRE gives a 3-year interim monitoring period before the new numerical limit becomes effective. The basis of this requirement is specified in the draft permit fact sheet attached to the October 28, 2020 email. The TRE Part condition including the listed schedule is a standard TRE condition developed by the Bureau of Clean Water. The monitoring and assessing plant performance can be part of the TRE work. If the facility requires more time to complete a TRE work and site-specific studies, the facility may notify the Department prior to the submission deadline; the Department may modify the schedule if needed based on the justification provided by the facility.

2. Response to Comment no. 2 regarding Outfalls 017 and 018 Sampling Requirements:
No change will be made to the permit. The facility has an option to check "no discharge" box on the DMR when there is no discharge from the outfall. The Department understands that these outfalls along with stormwater basins will be installed in the near future; and therefore stormwater discharge is expected from these new outfalls. Once the basins with outfalls are constructed and discharge occurs, the facility should initiate the sampling. Until then, the facility will need to indicate that there is no discharge by checking "no discharge" box on the DMR and provide a brief comment with the monthly DMR.

3. Response to Comment no. 3 regarding mass limits:
In general, the Department uses an annual average flow to develop effluent limits. The application as well as the recent WQM permit shows that the annual average flow for this facility is 0.10 MGD with the maximum monthly flow (or design hydraulic capacity) of 0.15 MGD. The Department has therefore decided to change all existing mass effluent limits that were calculated using 0.15 MGD so that all mass effluent limits are based on 0.10 MGD. This does not consider a major change to the draft permit; therefore, the Department tends to finalize the permit without re-drafting the permit.

Please feel free to call me at 717-705-4825 if you have any questions or need further clarification.
Thanks,
Jinsu

Jinsu Kim | Permits Section
Department of Environmental Protection | Clean Water Program
Southcentral Regional Office
909 Elmerton Avenue | Harrisburg, Pa 17110-8200
Phone: 717.705.4825 | Fax: 717.705.4760

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3. Emails with datasets from the permittee

Kim, Jin Su

From:	Menon, Rohan <rmenon2@wm.com>
Sent:	Tuesday, August 31, 2021 5:15 PM
To:	Kim, Jin Su
Cc:	Maurer, Aaron
Subject:	[External] Cumberland Landfill Wastewater Flows

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Jinsu,

The table below summarizes the total wastewater flows generated at the Cumberland landfill site since August of last year (12 months). The table includes total flows discharged via the NPDES outfall 001 (from on-site treatment plant) and the volume of leachate trucked off-site to local POTWs. Currently, the leachate treatment plant (LTP) is primarily treating and discharging groundwater flow. We have had some challenges over the last few months with treating barium. Some changes to the clarifier chemistry last week has helped achieve barium levels below the NPDES permit. We needed to add significant quantities of potassium permanganate (as high as 200 mg/L) along with aluminum (coagulant) and polymer (flocculant) to break to chelated/organically bound barium to finally precipitate it out in the clarifier.

As discussed previously, our overall goal is to maximize treatment of wastewater through the on-site LTP and eliminate leachate hauling. The table below shows the variation of total wastewater flows over the last 12 months. There are some months where the average monthly flows are much higher than 150,000 gpd. Overall, the annual average is approx.. 102,000 gpd. Note that the site also plans to add some new gas wells to dewater (not implemented yet) some of the cells at the site and are anticipating an increase in new and additional wastewater flows of approx.. 10,000 – 15,000 gpd, which could potentially increase the average to the 110,000 to 115,000 gpd range.

If you have sometime this week for a quick 30 min call, let us know. I can send you an evite to discuss this data and possible flow considerations for the mass load. We would be more comfortable to stay with the 150,000 gpd as the basis if its doable so that it will help us provide some buffer for months when our average flows are much higher. We are also very concerned about barium, considering the significant chemistry needed to achieve the current limit poses challenges and risks with consistency. We have not had much success with media-based systems (including media specifically for barium and GAC). Numerous trials with various chemistry combinations were not very successful until we had to increase the pre-oxidant dose significantly. Hoping we can also talk about possible options for barium in the new draft NPDES permit.

Sorry for the delay in connecting with you on this matter. We were trying to asses the flow impacts at the site since we couldn't rely on some of the previous data records (many of which were unavailable) being tracked by the previous owners of the landfill and challenges with barium treatment.

Let us know your flexibility for a call. Looking forward to our discussion.

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		2021 Leachate Disposal Summary (Cumberland Landfill)				
Month	Year	Days/ Month	Outfall (1)	Total Trucked (2)	Total Leachate Volume	Average Month
			Gallons	Gallons	Gallons	gpd
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September, 2020	2020	30	3,058,050	0	3,058,050	101,935
October, 2020	2020	31	3,210,546	0	3,210,546	103,566
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February, 2021	2021	28	731,053	409,935	1,140,988	40,750
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April, 2021	2021	30	2,022,670	2,049,053	4,071,723	135,724
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(1) Outfall Recordings					Annual Average (gpd)	102,049
(2) Liquids hauled to POTWs						

thanks

Rohan Menon
Director of Environmental Protection
rmenon2@wm.com

Kim, Jin Su

From:	Menon, Rohan <rmenon2@wm.com>
Sent:	Monday, September 13, 2021 2:31 PM
To:	Kim, Jin Su
Cc:	Maurer, Aaron
Subject:	[External] Cumberland Data
Attachments:	Cumberlad_Data_DEP_091321.xlsx

Jinsu,

Attached is the data on both barium and arsenic for your review. Aaron and I would be happy to walk you through the data on a call this week if you are available. Let us know your availability.
If you need any more information, let us know. As you are aware, the on-site LTP consists of the following processes and they are listed in order of the process flow through the plant. The bulk of our treatment assessments were on the clarifier (trying different chemistry combinations) and any polishing units after the clarifier (media based vessels and/or GAC).

1. 2 Storage tanks:
    a. Raw leachate storage to feed the on-site plant
    b. Treated effluent from the on-site plant (when we operated in recirculation mode and couldn't discharge leachate)
2. MBBR
3. Biotower 1
4. Biotower 2
5. Inclined plate clarifier (clarifier)
6. New Filter System (being considered for the future plant ops in place of the existing sand filter)
7. On one pilot scenario we added media vessels for barium removal after the filter.

The table provided includes data for both barium and arsenic:

1. Raw
2. When both leachate and GW were being discharged via Outfall 001 (after treatment through on-site plant)
3. Some data on combined conc. of treated leachate and GW that were being recirculated back to the storage tanks during various treatment scenarios.
4. Various bench and full-scale pilot studies conducted to achieve barium removal (coagulants, oxidants. Media, GAC etc. etc.)

Hope this information is helpful to make a determination on the barium issue.

Thanks
Rohan

Rohan Menon
Director of Environmental Protection

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Barium and Arsenic Data

Date	Parameter	Raw Leachate	Clarifier Influent	Clarifier Effluent	After Clarifier - Barium Media Vessel (influent)	After Clarifier - Barium Media Vessel (Effluent)	NPDES Outfall 001 with GW	Treated Leachate and GW Sent Back to Storage Tank	Treated Leachate Recirculated to Storage Tank	Clarifier Treatment Implemented to Remove Metals (Barium and Arsenic)	Notes
		mg/L	mg/L	mg/L			mg/L	mg./L	mg/L	mg/L	
4/15/2021	Total Barium						0.319		No	With Aluminum and Polymer	All other parameters were in compliance
	Total Arsenic						0.04				
4/21/2021	Total Barium						0.42		No	With Aluminum and Polymer	All other parameters were in compliance (STOPPED LEACHATE DISCHARGE SINCE Barium was in exceedance)
	Total Arsenic						0.04				
4/28/2021	Total Barium						0.044 (GW only)		Yes	With Aluminum and Polymer	Went into Pilot mode to evaluate barium treatment, No discharge of leachate via Outfall
	Total Arsenic						0.05 (GW Only)				
STOPPED ALL LEACHATE DISCHARGE FROM THIS POINT ONWARDS AND IMPLEMENTED PILOT/BENCH INVESTOGATIONS TO DETERMINE TREATMENT APPROACH FOR BARIUM											
4/29/2021	Total Barium		0.51	0.44					Yes	With Aluminum and Polymer (varying dosages)	Full-scale Pilot Trial
	Total Arsenic		0.15	0.03							
4/30/2021	Total Barium		0.46	0.43					Yes	With Aluminum and Polymer (varying dosages)	Full-scale Pilot Trial
	Total Arsenic		0.13	0.03							
5/7/2021	Total Barium		0.45	0.37					Yes	With Aluminum and Polymer (varying dosages)	Full-scale Pilot Trial
	Total Arsenic		0.11	<0.02							
5/12/2021	Total Barium	0.36 (Form 50)							Yes		Full-scale Pilot Trial
	Total Arsenic	0.1 (Form 50)									
5/28/2021	Total Barium		0.43	0.34					Yes	Peroxide Treatment in Clarifier	Full-scale Pilot Trial
	Total Arsenic		0.07	<0.02							
6/7/2021	Total Barium		0.41	0.36					Yes	Peroxide + Alumin (with Sulfate) in Clarifier	Full-scale Pilot Trial
	Total Arsenic		0.07	<0.02							
7/1/2021	Total Barium		0.37	0.34	0.29	0.29			Yes	With Barium media vessels on the clarifier effluent	Full-scale Pilot Trial
	Total Arsenic		0.59	0.1	0.1	0.1					
7/6/2021	Total Barium		0.35	0.27					Yes	Peroxide & Lime at pH 12	Bench Tests
	Total Arsenic		0.51	0.03							
7/6/2021	Total Barium			0.29					Yes	Peroxide & Lime at pH 10.5	Bench Tests
	Total Arsenic			0.02							
7/6/2021	Total Barium			0.3					Yes	Lime at pH 9.5	Bench Tests
	Total Arsenic			0.03							
7/6/2021	Total Barium			0.28					Yes	Lime at pH 10	Bench Tests
	Total Arsenic			0.03							
7/6/2021	Total Barium			0.26					Yes	Lime at pH 10.5	Bench Tests
	Total Arsenic			0.03							
7/14/2021	Total Barium				0.24	0.24			Yes	With Barium media vessels on the clarifier effluent	Full-scale Pilot Trial
	Total Arsenic				0.03	0.02					
8/3/2021	Total Barium			0.46	0.46				Yes	GAC 5000 mg/L dose	Bench Tests
	Total Arsenic			<0.02	<0.03						
8/3/2021	Total Barium			0.46	0.46				Yes	GAC 10,000 mg/L dose	Bench Tests
	Total Arsenic			<0.02	<0.03						
8/4/2021	Total Barium		0.78	0.43					Yes	Peroxide Trials in Clarifier	Full-scale Trial: dosages ranged form 25 to 100 mg/L to break the organic complex. Limited impact on barium. Clarifier was very unstabe with lot of floatable TSS in the clarifier effluent.
	Total Arsenic		0.57	<0.02							
8/9/2021	Total Barium	0.45 (Form 50)	0.35	0.33					Yes	Peroxide Trials in Clarifier	
	Total Arsenic	0.21 (Form 50)	0.21	0.11							
8/10/2021	Total Barium		0.33	0.3					Yes	Peroxide Trials in Clarifier	
	Total Arsenic		0.2	<0.02							
8/11/2021	Total Barium		0.34	0.29					Yes	Peroxide Trials in Clarifier	
	Total Arsenic		0.2	0.2							
8/18/2021	Total Barium		0.37					0.31	Yes	Pottassium Permanganate Trials in Clarifier	Full-Scale Trial: Finally very high dosages of pottassium permanganate resulted in some barium removal as shown in the last 3 data points.
	Total Arsenic		0.1					<0.02			
8/19/2021	Total Barium		0.35					0.28	Yes	Pottassium Permanganate Trials in Clarifier	
	Total Arsenic		0.09					<0.02			
8/20/2021	Total Barium		0.36					0.26	Yes	Pottassium Permanganate Trials in Clarifier	
	Total Arsenic		0.1					<0.02			
8/26/2021	Total Barium		0.31	0.18				0.16	Yes	Pottassium Permanganate Trials in Clarifier	
	Total Arsenic										
8/27/2021	Total Barium		0.32	0.18				0.14	Yes	Pottassium Permanganate Trials in Clarifier	
	Total Arsenic										
8/28/2021	Total Barium		0.34	0.14				0.14	Yes	Pottassium Permanganate Trials in Clarifier	
	Total Arsenic										

4. WQM 7.0 ver. 1.1

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
07B	10194	CONODOGUINET CREEK	65.400	510.00	191.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.100	0.00	16.10	0.000	0.000	0.0	0.00	0.00	23.40	8.40	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
Comm Refuse	PA0083941	0.1250	0.1250	0.1250	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	35.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	6.90	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
07B	10194	CONODOGUINET CREEK	63.900	506.00	206.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.100	0.00	16.10	0.000	0.000	0.0	0.00	0.00	20.00	8.40	20.00	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	0.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07B	10194	CONODOGUINET CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
65.400	16.10	0.00	16.10	.1934	0.00051	.886	70.41	79.43	0.26	0.351	23.42	8.29
Q1-10 Flow												
65.400	10.30	0.00	10.30	.1934	0.00051	NA	NA	NA	0.20	0.449	23.43	8.24
Q30-10 Flow												
65.400	21.90	0.00	21.90	.1934	0.00051	NA	NA	NA	0.31	0.296	23.41	8.32

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07B	10194	CONODOGUINET CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
65.400	0.125	23.419	8.291
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
70.414	0.886	79.430	0.261
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.39	0.203	0.08	0.911
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.205	0.976	Tsivoglou	5
Reach Travel Time (days)			
0.351			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.035	2.37	0.08	7.75
0.070	2.35	0.08	7.75
0.105	2.33	0.07	7.75
0.140	2.31	0.07	7.75
0.176	2.29	0.07	7.75
0.211	2.28	0.07	7.75
0.246	2.26	0.07	7.75
0.281	2.24	0.06	7.75
0.316	2.22	0.06	7.75
0.351	2.20	0.06	7.75

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07B	10194	CONODOGUINET 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
65.400	Comm Refuse	1.85	13.8	1.85	13.8	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
65.400	Comm Refuse	.38	6.9	.38	6.9	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
65.40	Comm Refuse	35	35	6.9	6.9	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07B	10194	CONODOGUINET 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)
65.400	Comm Refuse	PA0083941	0.125	CBOD5	35		
				NH3-N	6.9	13.8	
				Dissolved Oxygen			5

5. Toxics Management Spreadsheet (Untreated Leachate for Barium/Arsenic)

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Cumberland County Landfill** NPDES Permit No.: **PA0083941** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **IW Discharge**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.125	405	7						

					0 if left blank		0.6 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		1600									
	Chloride (PWS)	mg/L		434									
	Bromide	mg/L		3.5									
	Sulfate (PWS)	mg/L		205									
	Fluoride (PWS)	mg/L		5									
Group 2	Total Aluminum	µg/L		1437.409			1.269						
	Total Antimony	µg/L		2									
	Total Arsenic	µg/L		590									
	Total Barium	µg/L		780									
	Total Beryllium	µg/L	<	0.5									
	Total Boron	µg/L		2070									
	Total Cadmium	µg/L	<	0.1									
	Total Chromium (III)	µg/L		24.1									
	Hexavalent Chromium	µg/L	<	2									
	Total Cobalt	µg/L		9.1									
	Total Copper	µg/L		41.9									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L		84									
	Dissolved Iron	µg/L		562									
	Total Iron	µg/L		2427.3771			0.7621						
	Total Lead	µg/L		0.5									
	Total Manganese	µg/L		945									
	Total Mercury	µg/L	<	0.1									
	Total Nickel	µg/L		68.1									
	Total Phenols (Phenolics) (PWS)	µg/L		5.1									
	Total Selenium	µg/L		0.5									
	Total Silver	µg/L		0.1									
	Total Thallium	µg/L	<	0.1									
	Total Zinc	µg/L		32.2									
	Total Molybdenum	µg/L		8									
	Acrolein	µg/L	<	1									
	Acrylamide	µg/L	<	5									
	Acrylonitrile	µg/L	<	0.5									
	Benzene	µg/L	<	0.2									
	Bromoform	µg/L	<	0.2									

Group 3	Carbon Tetrachloride	µg/L	<	0.2									
	Chlorobenzene	µg/L		0.2									
	Chlorodibromomethane	µg/L		14.48									
	Chloroethane	µg/L	<	0.2			1.8554						
	2-Chloroethyl Vinyl Ether	µg/L	<	0.5									
	Chloroform	µg/L		0.5									
	Dichlorobromomethane	µg/L		0.4									
	1,1-Dichloroethane	µg/L	<	0.2									
	1,2-Dichloroethane	µg/L	<	0.2									
	1,1-Dichloroethylene	µg/L	<	0.2									
	1,2-Dichloropropane	µg/L	<	0.2									
	1,3-Dichloropropylene	µg/L	<	0.2									
	1,4-Dioxane	µg/L		5.5									
	Ethylbenzene	µg/L	<	0.2									
	Methyl Bromide	µg/L		16.9									
	Methyl Chloride	µg/L		53									
	Methylene Chloride	µg/L	<	0.4									
	1,1,2,2-Tetrachloroethane	µg/L	<	0.2									
	Tetrachloroethylene	µg/L	<	0.4									
	Toluene	µg/L	<	0.2									
	1,2-trans-Dichloroethylene	µg/L	<	0.2									
	1,1,1-Trichloroethane	µg/L	<	0.2									
	1,1,2-Trichloroethane	µg/L	<	0.5									
	Trichloroethylene	µg/L	<	0.2									
	Vinyl Chloride	µg/L	<	0.2									
Group 4	2-Chlorophenol	µg/L	<	5.1									
	2,4-Dichlorophenol	µg/L	<	5									
	2,4-Dimethylphenol	µg/L	<	5									
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<	5									
	2-Nitrophenol	µg/L	<	5									
	4-Nitrophenol	µg/L	<	5									
	p-Chloro-m-Cresol	µg/L	<	5									
	Pentachlorophenol	µg/L	<	5									
	Phenol	µg/L	<	5									
	2,4,6-Trichlorophenol	µg/L	<	5									
Group 5	Acenaphthene	µg/L	<	0.1									
	Acenaphthylene	µg/L	<	0.1									
	Anthracene	µg/L		0.2									
	Benzidine	µg/L	<	0.2									
	Benzo(a)Anthracene	µg/L	<	0.1									
	Benzo(a)Pyrene	µg/L	<	0.1									
	3,4-Benzofluoranthene	µg/L	<	0.2									
	Benzo(ghi)Perylene	µg/L	<	0.1									
	Benzo(k)Fluoranthene	µg/L	<	0.1									
	Bis(2-Chloroethoxy)Methane	µg/L	<	0.1									
	Bis(2-Chloroethyl)Ether	µg/L	<	0.1									
	Bis(2-Chloroisopropyl)Ether	µg/L		0.2									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	1									
	4-Bromophenyl Phenyl Ether	µg/L	<	0.1									
	Butyl Benzyl Phthalate	µg/L	<	1									
	2-Chloronaphthalene	µg/L	<	0.5									
	4-Chlorophenyl Phenyl Ether	µg/L	<	0.1									
	Chrysene	µg/L	<	0.1									
	Dibenzo(a,h)Anthrancene	µg/L	<	0.1									
	1,2-Dichlorobenzene	µg/L	<	0.1									
	1,3-Dichlorobenzene	µg/L	<	0.1									
	1,4-Dichlorobenzene	µg/L	<	0.2									
	3,3-Dichlorobenzidine	µg/L	<	1									
	Diethyl Phthalate	µg/L	<	1									
	Dimethyl Phthalate	µg/L	<	1									
	Di-n-Butyl Phthalate	µg/L	<	0.2									
	2,4-Dinitrotoluene	µg/L	<	0.2									

	2,6-Dinitrotoluene	µg/L	<	1										
	Di-n-Octyl Phthalate	µg/L	<	0.2										
	1,2-Diphenylhydrazine	µg/L	<	0.1										
	Fluoranthene	µg/L	<	0.1										
	Fluorene	µg/L	<	0.1										
	Hexachlorobenzene	µg/L	<	0.1										
	Hexachlorobutadiene	µg/L	<	0.1										
	Hexachlorocyclopentadiene	µg/L	<	0.2										
	Hexachloroethane	µg/L	<	0.1										
	Indeno(1,2,3-cd)Pyrene	µg/L	<	0.1										
	Isophorone	µg/L	<	0.2										
	Naphthalene	µg/L	<	0.1										
	Nitrobenzene	µg/L	<	0.1										
	n-Nitrosodimethylamine	µg/L		1.4										
	n-Nitrosodi-n-Propylamine	µg/L	<	0.1										
	n-Nitrosodiphenylamine	µg/L	<	0.1										
	Phenanthrene	µg/L	<	0.1										
	Pyrene	µg/L	<	0.1										
	1,2,4-Trichlorobenzene	µg/L	<	0.1										
Group 6	Aldrin	µg/L	<	0.02										
	alpha-BHC	µg/L	<	0.02										
	beta-BHC	µg/L	<	0.01										
	gamma-BHC	µg/L	<	0.01										
	delta BHC	µg/L	<	0.02										
	Chlordane	µg/L	<	0.51										
	4,4-DDT	µg/L	<	0.01										
	4,4-DDE	µg/L	<	0.01										
	4,4-DDD	µg/L	<	0.02										
	Dieldrin	µg/L	<	0.01										
	alpha-Endosulfan	µg/L	<	0.01										
	beta-Endosulfan	µg/L	<	0.01										
	Endosulfan Sulfate	µg/L	<	0.01										
	Endrin	µg/L	<	0.01										
	Endrin Aldehyde	µg/L	<	0.02										
	Heptachlor	µg/L	<	0.01										
	Heptachlor Epoxide	µg/L	<	0.01										
	PCB-1016	µg/L	<	0.22										
	PCB-1221	µg/L	<	0.22										
	PCB-1232	µg/L	<	0.22										
	PCB-1242	µg/L	<	0.22										
	PCB-1248	µg/L	<	0.22										
	PCB-1254	µg/L	<	0.22										
	PCB-1260	µg/L	<	0.22										
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<	0.5										
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Cumberland County Landfill, NPDES Permit No. PA0083941, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: Conodoguinet Creek

No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	010194	65.4	510	191			Yes
End of Reach 1	010194	63.9	506	206			Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	65.4	0.1	16.1									178	8.4		
End of Reach 1	63.9	0.1	16.8									100	7		

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	65.4														
End of Reach 1	63.9														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Cumberland County Landfill, NPDES Permit No. PA0083941, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.206 Analysis Hardness (mg/l): 190.51 Analysis pH: 8.03

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	13,608	
Total Antimony	0	0		0	1,100	1,100	19,959	
Total Arsenic	0	0		0	340	340	6,169	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	381,032	
Total Boron	0	0		0	8,100	8,100	146,970	
Total Cadmium	0	0		0	3.767	4.11	74.5	Chem Translator of 0.917 applied
Total Chromium (III)	0	0		0	965.937	3,057	55,463	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	296	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	1,724	
Total Copper	0	0		0	24.667	25.7	466	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	129.286	185	3,365	Chem Translator of 0.697 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	29.9	Chem Translator of 0.85 applied
Total Nickel	0	0		0	807.749	809	14,685	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	9.747	11.5	208	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	1,179	
Total Zinc	0	0		0	202.316	207	3,753	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	54.4	

Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	650	650	11,794	
Benzene	0	0		0	640	640	11,612	
Bromoform	0	0		0	1,800	1,800	32,660	
Carbon Tetrachloride	0	0		0	2,800	2,800	50,804	
Chlorobenzene	0	0		0	1,200	1,200	21,773	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	326,599	
Chloroform	0	0		0	1,900	1,900	34,474	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	272,166	
1,1-Dichloroethylene	0	0		0	7,500	7,500	136,083	
1,2-Dichloropropane	0	0		0	11,000	11,000	199,588	
1,3-Dichloropropylene	0	0		0	310	310	5,625	
Ethylbenzene	0	0		0	2,900	2,900	52,619	
Methyl Bromide	0	0		0	550	550	9,979	
Methyl Chloride	0	0		0	28,000	28,000	508,043	
Methylene Chloride	0	0		0	12,000	12,000	217,733	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	18,144	
Tetrachloroethylene	0	0		0	700	700	12,701	
Toluene	0	0		0	1,700	1,700	30,845	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	123,382	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	54,433	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	61,691	
Trichloroethylene	0	0		0	2,300	2,300	41,732	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	10,161	
2,4-Dichlorophenol	0	0		0	1,700	1,700	30,845	
2,4-Dimethylphenol	0	0		0	660	660	11,975	
2,4-Dinitrophenol	0	0		0	660	660	11,975	
2-Nitrophenol	0	0		0	8,000	8,000	145,155	
4-Nitrophenol	0	0		0	2,300	2,300	41,732	
p-Chloro-m-Cresol	0	0		0	160	160	2,903	
Pentachlorophenol	0	0		0	24.629	24.6	447	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	8,346	
Acenaphthene	0	0		0	83	83.0	1,506	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	5,443	
Benzo(a)Anthracene	0	0		0	0.5	0.5	9.07	
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	544,332	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	81,650	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	4,899	
Butyl Benzyl Phthalate	0	0		0	140	140	2,540	

2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	14,878	
1,3-Dichlorobenzene	0	0		0	350	350	6,351	
1,4-Dichlorobenzene	0	0		0	730	730	13,245	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	72,578	
Dimethyl Phthalate	0	0		0	2,500	2,500	45,361	
Di-n-Butyl Phthalate	0	0		0	110	110	1,996	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	29,031	
2,6-Dinitrotoluene	0	0		0	990	990	17,963	
1,2-Diphenylhydrazine	0	0		0	15	15.0	272	
Fluoranthene	0	0		0	200	200	3,629	
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	181	
Hexachlorocyclopentadiene	0	0		0	5	5.0	90.7	
Hexachloroethane	0	0		0	60	60.0	1,089	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	181,444	
Naphthalene	0	0		0	140	140	2,540	
Nitrobenzene	0	0		0	4,000	4,000	72,578	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	308,455	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	5,443	
Phenanthrene	0	0		0	5	5.0	90.7	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	2,359	
Aldrin	0	0		0	3	3.0	54.4	
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	17.2	
Chlordane	0	0		0	2.4	2.4	43.5	
4,4-DDT	0	0		0	1.1	1.1	20.0	
4,4-DDE	0	0		0	1.1	1.1	20.0	
4,4-DDD	0	0		0	1.1	1.1	20.0	
Dieldrin	0	0		0	0.24	0.24	4.35	
alpha-Endosulfan	0	0		0	0.22	0.22	3.99	
beta-Endosulfan	0	0		0	0.22	0.22	3.99	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	0.086	0.086	1.56	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.52	0.52	9.44	
Heptachlor Epoxide	0	0		0	0.5	0.5	9.07	
Toxaphene	0	0		0	0.73	0.73	13.2	

☑ *CFC* CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 180.69 Analysis pH: 8.29

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	18,537	
Total Arsenic	0	0		0	150	150	12,639	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	345,457	
Total Boron	0	0		0	1,600	1,600	134,813	
Total Cadmium	0	0		0	0.371	0.42	35.3	Chem Translator of 0.884 applied
Total Chromium (III)	0	0		0	120.321	140	11,788	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	876	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	1,601	
Total Copper	0	0		0	14.848	15.5	1,303	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	126,387	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	4.762	6.76	569	Chem Translator of 0.705 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	76.3	Chem Translator of 0.85 applied
Total Nickel	0	0		0	85.789	86.0	7,250	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	420	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	1,095	
Total Zinc	0	0		0	195.030	198	16,666	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	253	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	130	130	10,954	
Benzene	0	0		0	130	130	10,954	
Bromoform	0	0		0	370	370	31,175	
Carbon Tetrachloride	0	0		0	560	560	47,184	
Chlorobenzene	0	0		0	240	240	20,222	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	294,903	
Chloroform	0	0		0	390	390	32,861	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	261,200	
1,1-Dichloroethylene	0	0		0	1,500	1,500	126,387	
1,2-Dichloropropane	0	0		0	2,200	2,200	185,367	
1,3-Dichloropropylene	0	0		0	61	61.0	5,140	
Ethylbenzene	0	0		0	580	580	48,870	
Methyl Bromide	0	0		0	110	110	9,268	

Methyl Chloride	0	0		0	5,500	5,500	463,419	
Methylene Chloride	0	0		0	2,400	2,400	202,219	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	17,694	
Tetrachloroethylene	0	0		0	140	140	11,796	
Toluene	0	0		0	330	330	27,805	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	117,961	
1,1,1-Trichloroethane	0	0		0	610	610	51,397	
1,1,2-Trichloroethane	0	0		0	680	680	57,295	
Trichloroethylene	0	0		0	450	450	37,916	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	9,268	
2,4-Dichlorophenol	0	0		0	340	340	28,648	
2,4-Dimethylphenol	0	0		0	130	130	10,954	
2,4-Dinitrophenol	0	0		0	130	130	10,954	
2-Nitrophenol	0	0		0	1,600	1,600	134,813	
4-Nitrophenol	0	0		0	470	470	39,601	
p-Chloro-m-Cresol	0	0		0	500	500	42,129	
Pentachlorophenol	0	0		0	18.896	18.9	1,592	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	7,667	
Acenaphthene	0	0		0	17	17.0	1,432	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	4,971	
Benzo(a)Anthracene	0	0		0	0.1	0.1	8.43	
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	505,548	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	76,675	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	4,550	
Butyl Benzyl Phthalate	0	0		0	35	35.0	2,949	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	13,481	
1,3-Dichlorobenzene	0	0		0	69	69.0	5,814	
1,4-Dichlorobenzene	0	0		0	150	150	12,639	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	67,406	
Dimethyl Phthalate	0	0		0	500	500	42,129	
Di-n-Butyl Phthalate	0	0		0	21	21.0	1,769	
2,4-Dinitrotoluene	0	0		0	320	320	26,963	
2,6-Dinitrotoluene	0	0		0	200	200	16,852	
1,2-Diphenylhydrazine	0	0		0	3	3.0	253	

Fluoranthene	0	0		0	40	40.0	3,370	
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	169	
Hexachlorocyclopentadiene	0	0		0	1	1.0	84.3	
Hexachloroethane	0	0		0	12	12.0	1,011	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	176,942	
Naphthalene	0	0		0	43	43.0	3,623	
Nitrobenzene	0	0		0	810	810	68,249	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	286,477	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	4,971	
Phenanthrene	0	0		0	1	1.0	84.3	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	2,191	
Aldrin	0	0		0	0.1	0.1	8.43	
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	0.36	
4,4-DDT	0	0		0	0.001	0.001	0.084	
4,4-DDE	0	0		0	0.001	0.001	0.084	
4,4-DDD	0	0		0	0.001	0.001	0.084	
Dieldrin	0	0		0	0.056	0.056	4.72	
alpha-Endosulfan	0	0		0	0.056	0.056	4.72	
beta-Endosulfan	0	0		0	0.056	0.056	4.72	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	0.036	0.036	3.03	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.0038	0.004	0.32	
Heptachlor Epoxide	0	0		0	0.0038	0.004	0.32	
Toxaphene	0	0		0	0.0002	0.0002	0.017	

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

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
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	472	
Total Arsenic	0	0		0	10	10.0	843	

Total Barium	0	0		0	2,400	2,400	202,219	
Total Boron	0	0		0	3,100	3,100	261,200	
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	
Dissolved Iron	0	0		0	300	300	25,277	
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	84,258	
Total Mercury	0	0		0	0.050	0.05	4.21	
Total Nickel	0	0		0	610	610	51,397	
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	20.2	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	253	
Acrylamide	0	0		0	N/A	N/A	N/A	
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	8,426	
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	N/A	N/A	N/A	
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	2,781	
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	5,730	
Methyl Bromide	0	0		0	100	100.0	8,426	
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	4,803	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	8,426	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	842,579	
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	2,528	
2,4-Dichlorophenol	0	0		0	10	10.0	843	
2,4-Dimethylphenol	0	0		0	100	100.0	8,426	
2,4-Dinitrophenol	0	0		0	10	10.0	843	
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	337,032	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	5,898	
Anthracene	0	0		0	300	300	25,277	
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	16,852	
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	8.43	
2-Chloronaphthalene	0	0		0	800	800	67,406	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	84,258	
1,3-Dichlorobenzene	0	0		0	7	7.0	590	
1,4-Dichlorobenzene	0	0		0	300	300	25,277	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	50,555	
Dimethyl Phthalate	0	0		0	2,000	2,000	168,516	
Di-n-Butyl Phthalate	0	0		0	20	20.0	1,685	
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	1,685	
Fluorene	0	0		0	50	50.0	4,213	
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	337	
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	2,865	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	843	

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	1,685	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	5.9	
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	354	
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	1,685	
beta-Endosulfan	0	0		0	20	20.0	1,685	
Endosulfan Sulfate	0	0		0	20	20.0	1,685	
Endrin	0	0		0	0.03	0.03	2.53	
Endrin Aldehyde	0	0		0	1	1.0	84.3	
Heptachlor	0	0		0	N/A	N/A	N/A	
Heptachlor Epoxide	0	0		0	N/A	N/A	N/A	
Toxaphene	0	0		0	N/A	N/A	N/A	

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

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
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	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	
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	
Acrylamide	0	0		0	0.07	0.07	30.6	
Acrylonitrile	0	0		0	0.06	0.06	26.2	
Benzene	0	0		0	0.58	0.58	253	
Bromoform	0	0		0	7	7.0	3,058	
Carbon Tetrachloride	0	0		0	0.4	0.4	175	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	349	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	2,490	
Dichlorobromomethane	0	0		0	0.95	0.95	415	
1,2-Dichloroethane	0	0		0	9.9	9.9	4,325	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	393	
1,3-Dichloropropylene	0	0		0	0.27	0.27	118	
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	8,737	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	87.4	
Tetrachloroethylene	0	0		0	10	10.0	4,369	
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	240	
Trichloroethylene	0	0		0	0.6	0.6	262	
Vinyl Chloride	0	0		0	0.02	0.02	8.74	
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	
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	13.1	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	655	

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	0.044	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.44	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.044	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.44	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	4.37	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	13.1	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	140	
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	52.4	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.044	
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	21.8	
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	21.8	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	21.8	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	13.1	
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	0.035	
Hexachlorobutadiene	0	0		0	0.01	0.01	4.37	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	43.7	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.44	
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	0.31	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	2.18	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	1,442	
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	0.0003	
alpha-BHC	0	0		0	0.0004	0.0004	0.17	
beta-BHC	0	0		0	0.008	0.008	3.49	
gamma-BHC	0	0		0	N/A	N/A	N/A	

Chlordane	0	0		0	0.0003	0.0003	0.13	
4,4-DDT	0	0		0	0.00003	0.00003	0.013	
4,4-DDE	0	0		0	0.00002	0.00002	0.009	
4,4-DDD	0	0		0	0.0001	0.0001	0.044	
Dieldrin	0	0		0	0.000001	0.000001	0.0004	
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	0.003	
Heptachlor Epoxide	0	0		0	0.00003	0.00003	0.013	
Toxaphene	0	0		0	0.0007	0.0007	0.31	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Arsenic	0.88	1.37	843	1,315	2,106	µg/L	843	THH	Discharge Conc ≥ 50% WQBEL (RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	299	AFC	Discharge Conc > 10% WQBEL (no RP)
n-Nitrosodimethylamine	0.0003	0.0005	0.31	0.48	0.76	µg/L	0.31	CRL	Discharge Conc ≥ 50% WQBEL (RP)

☑ ***Other Pollutants without Limits or Monitoring***

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

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
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	16,564	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	472	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	202,219	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	94,202	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	35.3	µg/L	Discharge Conc < TQL
Total Chromium (III)	11,788	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	189	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	1,105	µg/L	Discharge Conc ≤ 10% WQBEL

Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	25,277	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	126,387	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	569	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	84,258	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	4.21	µg/L	Discharge Conc < TQL
Total Nickel	7,250	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	420	µg/L	Discharge Conc ≤ 10% WQBEL
Total Silver	133	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	20.2	µg/L	Discharge Conc < TQL
Total Zinc	2,406	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	34.9	µg/L	Discharge Conc < TQL
Acrylamide	30.6	µg/L	Discharge Conc ≤ 25% WQBEL
Acrylonitrile	26.2	µg/L	Discharge Conc < TQL
Benzene	253	µg/L	Discharge Conc < TQL
Bromoform	3,058	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	175	µg/L	Discharge Conc < TQL
Chlorobenzene	8,426	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	349	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	209,337	µg/L	Discharge Conc < TQL
Chloroform	2,490	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	415	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	4,325	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	2,781	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	393	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	118	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	5,730	µg/L	Discharge Conc < TQL
Methyl Bromide	6,396	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Chloride	325,635	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	8,737	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	87.4	µg/L	Discharge Conc < TQL
Tetrachloroethylene	4,369	µg/L	Discharge Conc < TQL
Toluene	4,803	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	8,426	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	34,889	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	240	µg/L	Discharge Conc < TQL
Trichloroethylene	262	µg/L	Discharge Conc < TQL
Vinyl Chloride	8.74	µg/L	Discharge Conc < TQL
2-Chlorophenol	2,528	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	843	µg/L	Discharge Conc < TQL

2,4-Dimethylphenol	7,676	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	843	µg/L	Discharge Conc < TQL
2-Nitrophenol	93,039	µg/L	Discharge Conc < TQL
4-Nitrophenol	26,749	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	1,861	µg/L	Discharge Conc < TQL
Pentachlorophenol	13.1	µg/L	Discharge Conc < TQL
Phenol	337,032	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	655	µg/L	Discharge Conc < TQL
Acenaphthene	965	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	25,277	µg/L	Discharge Conc ≤ 25% WQBEL
Benzidine	0.044	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.44	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.044	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.44	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	4.37	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	13.1	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	16,852	µg/L	Discharge Conc ≤ 25% WQBEL
Bis(2-Ethylhexyl)Phthalate	140	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	3,140	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	8.43	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	67,406	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	52.4	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.044	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	9,536	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	590	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	8,490	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	21.8	µg/L	Discharge Conc < TQL
Diethyl Phthalate	46,519	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	29,075	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	1,279	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	21.8	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	21.8	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	13.1	µg/L	Discharge Conc < TQL
Fluoranthene	1,685	µg/L	Discharge Conc < TQL
Fluorene	4,213	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.035	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	4.37	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	58.1	µg/L	Discharge Conc < TQL
Hexachloroethane	43.7	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.44	µg/L	Discharge Conc < TQL

Isophorone	2,865	µg/L	Discharge Conc < TQL
Naphthalene	1,628	µg/L	Discharge Conc < TQL
Nitrobenzene	843	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	2.18	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	1,442	µg/L	Discharge Conc < TQL
Phenanthrene	58.1	µg/L	Discharge Conc < TQL
Pyrene	1,685	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	5.9	µg/L	Discharge Conc < TQL
Aldrin	0.0003	µg/L	Discharge Conc < TQL
alpha-BHC	0.17	µg/L	Discharge Conc < TQL
beta-BHC	3.49	µg/L	Discharge Conc < TQL
gamma-BHC	11.0	µg/L	Discharge Conc < TQL
delta BHC	N/A	N/A	No WQS
Chlordane	0.13	µg/L	Discharge Conc < TQL
4,4-DDT	0.013	µg/L	Discharge Conc < TQL
4,4-DDE	0.009	µg/L	Discharge Conc < TQL
4,4-DDD	0.044	µg/L	Discharge Conc < TQL
Dieldrin	0.0004	µg/L	Discharge Conc < TQL
alpha-Endosulfan	2.56	µg/L	Discharge Conc < TQL
beta-Endosulfan	2.56	µg/L	Discharge Conc < TQL
Endosulfan Sulfate	1,685	µg/L	Discharge Conc < TQL
Endrin	1.0	µg/L	Discharge Conc < TQL
Endrin Aldehyde	84.3	µg/L	Discharge Conc < TQL
Heptachlor	0.003	µg/L	Discharge Conc < TQL
Heptachlor Epoxide	0.013	µg/L	Discharge Conc < TQL
PCB-1016	N/A	N/A	No WQS
PCB-1221	N/A	N/A	No WQS
PCB-1232	N/A	N/A	No WQS
PCB-1242	N/A	N/A	No WQS
PCB-1248	N/A	N/A	No WQS
PCB-1254	N/A	N/A	No WQS
PCB-1260	N/A	N/A	No WQS
Toxaphene	0.017	µg/L	Discharge Conc < TQL

6. Toxics Management Spreadsheet (Treated Leachate for Barium/Arsenic); same as 5 except for maximum discharge concentrations and recommended WQBELs and Monitoring Requirements for Arsenic.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Cumberland County Landfill** NPDES Permit No.: **PA0083941** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **IW Discharge**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.125	405	7						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		1600									
	Chloride (PWS)	mg/L		434									
	Bromide	mg/L		3.5									
	Sulfate (PWS)	mg/L		205									
	Fluoride (PWS)	mg/L		5									
Group 2	Total Aluminum	µg/L		1437.409			1.269						
	Total Antimony	µg/L		2									
	Total Arsenic	µg/L		100									
	Total Barium	µg/L		460									
	Total Beryllium	µg/L	<	0.5									
	Total Boron	µg/L		2070									
	Total Cadmium	µg/L	<	0.1									
	Total Chromium (III)	µg/L		24.1									
	Hexavalent Chromium	µg/L	<	2									
	Total Cobalt	µg/L		9.1									
	Total Copper	µg/L		41.9									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L		84									
	Dissolved Iron	µg/L		562									
	Total Iron	µg/L		2427.3771			0.7621						
	Total Lead	µg/L		0.5									
	Total Manganese	µg/L		945									
	Total Mercury	µg/L	<	0.1									
	Total Nickel	µg/L		68.1									
	Total Phenols (Phenolics) (PWS)	µg/L		5.1									
	Total Selenium	µg/L		0.5									
	Total Silver	µg/L		0.1									
	Total Thallium	µg/L	<	0.1									
	Total Zinc	µg/L		32.2									
	Total Molybdenum	µg/L		8									
	Acrolein	µg/L	<	1									
	Acrylamide	µg/L	<	5									
	Acrylonitrile	µg/L	<	0.5									
	Benzene	µg/L	<	0.2									
	Bromoform	µg/L	<	0.2									

Chlordane	0	0		0	0.0003	0.0003	0.13	
4,4-DDT	0	0		0	0.00003	0.00003	0.013	
4,4-DDE	0	0		0	0.00002	0.00002	0.009	
4,4-DDD	0	0		0	0.0001	0.0001	0.044	
Dieldrin	0	0		0	0.000001	0.000001	0.0004	
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	0.003	
Heptachlor Epoxide	0	0		0	0.00003	0.00003	0.013	
Toxaphene	0	0		0	0.0007	0.0007	0.31	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Arsenic	Report	Report	Report	Report	Report	µg/L	843	THH	Discharge Conc > 10% WQBEL (no RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	299	AFC	Discharge Conc > 10% WQBEL (no RP)
n-Nitrosodimethylamine	0.0003	0.0005	0.31	0.48	0.76	µg/L	0.31	CRL	Discharge Conc ≥ 50% WQBEL (RP)

☑ ***Other Pollutants without Limits or Monitoring***

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

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
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	16,564	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	472	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	202,219	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	94,202	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	35.3	µg/L	Discharge Conc < TQL
Total Chromium (III)	11,788	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	189	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	1,105	µg/L	Discharge Conc ≤ 10% WQBEL